Digital Financial Reporting

Using an XBRL-based syntax

A resource for external financial reporting managers, other accountants, internal auditors, external auditors, financial analysts, regulators, and other business professionals when creating, reviewing, auditing, consuming, or analysing XBRL-based digital financial reports; software developers or other information technology professionals building tools for professional accountants

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About the authors:

Charles Hoffman, CPA, is credited as being the *Father of XBRL*. He started his public accounting career as an auditor with the international firm then called Price Waterhouse, served various roles in industry and public accounting for over 25 years, and has worked with XBRL since its introduction by the AICPA in 1998. In 2006, he received the AICPA Special Recognition Award for his pioneering role in developing XBRL. He has authored numerous publications including *XBRL for Dummies*, a number of *Journal of Accountancy* articles, writes a blog relating to XBRL, and contributed to a number of XBRL related technical specification and best practices documents. Currently, Charlie works as a consultant to CPAs and software vendors who want to better understand the subtle details of this new digital medium.

Charlie was co-editor of the first ever US GAAP XBRL taxonomy, contributor to the *XBRL 2.1 Specification* and the *XBRL Dimensions* specification, editor of the *Financial Reporting Taxonomy Architecture* and *Financial Reporting Instance Standards*, co-author of the *US GAAP Taxonomy Architecture*, part of the project team which created the *US GAAP Taxonomy*, and a major contributor to the IFRS XBRL taxonomy for a five year period, and consultant to numerous other XBRL taxonomy projects.

Raynier van Egmond is an IT professional with more than 25 years of ICT development and design expertise in financial and manufacturing industries and research. He has been involved in the XBRL community since its inception in 1999, and he's been an active participant in development of the XBRL standard. Raynier contributed to and coauthored several parts of the XBRL specification and best-practices definitions. He managed development and deployment of XBRL solutions worldwide for the private, public, and nonprofit sector and national governments. He was the architect of the final version of the Dutch government Netherlands 2008 taxonomy and consulted as technical manager for the project responsible for quality assurance and its deployment. Most recently he has defined the Medical Protocol Markup Language using XBRL to support a proof of concept application of XBRL in the Healthcare industry. Raynier is currently the CEO of XBRL Consulting Partners LLC.

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1. Introduction

The general purpose financial report is getting a face lift, being updated for the 21st century[1]. It is hard to say exactly when this process began. In the early 1900's financial disclosures became more standardized. In the 1970's efforts began to create a set of international financial reporting standards. In the last part of the 20th century the XBRL technical specification was created, establishing a global standard technical syntax usable for business and financial reporting. In the early 21st century the US Securities and Exchange Commission funded the creation of the US GAAP XBRL Taxonomy and mandated that public companies report to the SEC using the XBRL technical syntax.

But public companies who report to the SEC amount to only about 10,000 entities that are regulated by the SEC. There are still approximately:

- 90,000 state and local governmental entities in the US
- 360,000 not-for-profit entities in the US
- 28,000,000 private entities in the US

Similar numbers of state and local governmental entities, not-for-profits, and private entities likewise exist in other parts of the world.

All these entities could benefit from the digital financial report. But what are the benefits of a digital financial report as contract to current paper-based or electronic financial reports?

Think about something. Today, how much does the tool you are using to create a financial report understand about financial reports? Two primary tools used are Microsoft Excel and Word. What do those applications understand about financial reports or the process of financial reporting? They understand nothing. What if software did understand the financial reports with which they are interacting?

1.1. Contrasting digital financial report to digital blueprints

Digital financial reporting has the opportunity to do for the financial report and the financial reporting supply chain what CAD/CAM did for not only the blueprint, but for the entire product design and manufacturing life cycle[2]. The following is a brief explanation of CAD, commuter aided design[3]:

> CAD software is used to increase the productivity of the designer, improve the quality of design, improve communications through documentation, and to create a database for manufacturing. CAD output is often in the form of electronic files for print, machining, or other manufacturing operations.

In CAD/CAM software architectural objects have relationships to one another and interact with each other intelligently. For example, a window has a relationship to the wall that contains it. If you move or delete the wall, the window reacts accordingly.

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[1] Web 3.0 Manifesto, http://project10x.com/bio_downloads/web3_manifesto_2009.pdf

[2] *A Brief Overview of the History of CAD*, 2008 David E. Weisberg, http://www.cadhistory.net/02%20Brief%20Overview.pdf

[3] Computer-aided Design, Wikipedia, http://en.wikipedia.org/wiki/Computer-aided_design

In addition, in CAD/CAM software machine-readable architectural objects maintain dynamic links with construction documents and specifications, resulting in more accurate project deliverables. When someone deletes or modifies a door, the door schedule is automatically updated in your local application's database and perhaps even in the database of the door supplier. Spaces and areas are update automatically when the size of a room is changed and calculations such as total square footage are always up to date. That means, say, that the amount of paint necessary to cover a room or an entire building is always updated. Blueprints can be sent directly to numerically controlled (NC) machines.

Well organized machine-readable information has other uses as well. Domains of knowledge articulated in machine-readable form can leverage the power of computers to more rigorously communicate that information. For example, ambiguity can be reduced from the US GAAP conceptual framework which is the basis for financial reporting in the U.S.[4] Today, less reliable humans are used to remove ambiguity. Research of a domain of knowledge, such as the FASB Accounting Standards Codification (ASC)[5], can be made easier and more reliable leveraging machine-readable semantic information. Both text-based search but even more compelling is semantic-oriented search[6].

But to make digital financial reports usable, digital financial reports need to work. Defining "work" can be subjective. What "work" means must be decided by the participants of the financial reporting supply chain, the ultimate creators and users of such financial reports. Other aspects of defining work are less subjective or even completely objective and even mechanical[7].

1.2. Automating "the last mile" of disclosure management

So exactly what can be automated? A lot of people are referring to what we call digital financial reporting as disclosure management.

Mike Willis, a PWC partner, wrote an article *Disclosure management: Streamlining the Last Mile*[8] which explains how software applications can enable a streamlining of current "last mile" manual financial report assembly and review processes. He points out that companies can increase net benefits by gaining a clear understanding of common areas where opportunities exist for financial reporting process enhancement. This is a summary of what a disclosure management system needs to do, per Mike Willis:

An effective Disclosure Management implementation should enable many of the capabilities and process enhancements such as:

- Automated Spreadsheet Assembly;

---

[4] Accountants Understand Utility of Ontology for Reducing Ambiguity Conceptual Framework , http://xbrl.squarespace.com/journal/2015/4/19/accountants-understand-utility-of-ontology-for-reducing-ambi.html

[5] FASB ASC, https://asc.fasb.org/

[6] *The Future of Search*, see section *Semantics - Giving Search Meaning*, https://www.linkedin.com/pulse/future-search-kurt-cagle

[7] See *Understanding the Basic Mechanics of a Digital Financial Report*, section Understanding the notion of slot or opening, page 9, http://www.xbrlsite.com/2015/Library/UnderstandingTheMechanicsOfDigitalFinancialReport.pdf

[8] *Disclosure Management: Streamlining the Last Mile*, http://www.pwc.com/gx/en/xbrl/pdf/pwc-streamlining-last-mile-report.pdf

- Automated Report Assembly;
- Automated Report Validation;
- Automated Narrative Text Generation;
- Contextual Review Process;
- Automated XBRL Reports;
- Automated Benchmarking;
- Explicit References;
- Collaborative Review Processes;
- Virtual Service Center.

What Mike Willis is pointing out is only the tip of a much bigger iceberg in my view. In another blog post I pointed out specific categories of benefits:

- **Reliable repurposing of information**: Reported information can be easily and reliably reconfigured, reformatted and otherwise repurposed without rekeying to suit the specific needs of an analyst or regulator.
- **Reduced ambiguity**: Ambiguity is reduced because for a computer to make use of the information, that information cannot be ambiguous. Making the information easy for a computer to understand also makes it easier for humans to communicate more effectively.
- **Reliable automated workflow**: Processes can be reliably automated because computers can reliably move information through the workflow. Linking digital financial information together based on the meaning of the information can be much more reliable than trying to link physical locations within spreadsheets, which commonly change.
- **Adaptable software**: Software can easily adapt itself to specific reporting scenarios and user preferences because it understands the information it is working with.

Financial reporting is poised for a similar change enabled by structured formats such as XBRL which is very similar to the change that occurred when CAD/CAM made blueprints digital. CAD/CAM did not just change the blueprint, it changed the entire design supply chain.

But for this change to occur for digital financial reporting, information technology professionals need to build the right software for accounting professionals. A first step in that process for both accounting professionals and information technology professionals is to understand the basic mechanics of a financial report.

1.3. Digital business reporting

Digital financial reporting is part of a broader trend, digital business reporting. While this new digital paradigm has not overtaken the current financial reporting paradigm, chances are that it will. No one knows for sure exactly when, no one knows everything about what this change might mean.

Digital analysis of financial information has been around for years. Digital reporting will help deal with the problem of information overload. Digital is not software, digital is a mindset[9].

1.4. Impact on professional accountants

To remain relevant, CPAs and other accountants need to adjust their thinking about how to appropriately modify financial reporting to keep up with the digital revolution. These and other business professionals need to figure out the best ways to employ this new digital medium, where, and they must understand the ramifications of any change.

Even with good tools, a tool in the hands of someone with inadequate knowledge can produce substandard results. Poor tools can make this situation even worse. But give a knowledgeable, skilled craftsman the right tools and they can produce high-quality and even beautiful and elegant results.

This resource is for professionals who choose to be masters at their craft. It will help CPA, external financial reporting managers, other accountants, financial analysts, regulators, and other business professionals understand the moving pieces of the new digital financial reporting paradigm and create high-quality digital financial reports.

1.5. About this document

It takes hard work to master a model or create a theory. A creator of a theory or model is attempting to discover the seemingly invisible principles that hide behind appearances. Theories don't simplify. Theories describe the principles by which the world operates. A theory or model is characterized by its intent: the discovery of essence.

Theories or models make things easier to understand. Theories and models articulate rules that anyone can then follow.

Rene van Egmond and I have been collaborating, trying to figure out how to properly employ XBRL for financial reporting since the very first XBRL International meeting in 1999. Rene has a strong technical background; I have a strong financial reporting background. We both know people all around the world who know bits and pieces about XBRL. We have both looked at this information attentively. We have both looked at it closely. We have both looked at it over, and over, and over. I was funded by UBmatrix to do nothing else but understand XBRL for over 12 years and took full advantage of that opportunity. I worked with world class accountants on creating both the IFRS and US GAAP XBRL taxonomies. I was very lucky.

The U.S. Securities and Exchange Commission (SEC) mandated XBRL-based digital financial reporting beginning in about 2009. Since that time thousands and thousands of digital financial reports have been publically available. Poking and

[9] Digital isn't software, it is a mindset, http://xbrl.squarespace.com/journal/2014/3/18/digital-isnt-software-it-is-a-mindset.html

prodding[10] those XBRL-based digital financial reports helps one understand digital financial reporting. I have published most of my analysis on my blog[11].

Rene and I have taken what we have learned and organized and synthesized it into this resource.

This resource helps accounting professionals and other business professionals cut through all the noise and misunderstandings which surrounds this new technology, XBRL. This resource allows business to focus on what is truly important and not be distracted by the underlying technology which there is no need for business professionals to ever deal with.

This resource also helps information technology professionals and software developers to understand what business professionals truly need from software applications in support of digital financial reporting.

While this resource uses XBRL to explain digital financial reporting, XBRL is really only one of many technical tools which will be employed for digital financial reporting. While XBRL is a widely employed technical tool, it is not the only tool and there is more to digital financial reporting than the XBRL technical tools. XBRL is simply one of many enabling technologies. Other technologies contribute to digital financial reporting such as SKOS, OWL, RDF, RIF, NOSQL, XML, XLink, and so on. The list is long.

Information in this document was accumulated over a period of about fifteen years. It represents, arguably, the best resource available today to understanding digital financial reporting. The information and knowledge has been accumulated, synthesized, organized, and explained as best as possible given the current point in time of the evolution of XBRL, digital financial reporting, software available to business professionals, etc.

1.6. Assumptions about reader

We make the following assumptions about the reader of this resource:

- We assume that you are not the average professional accountant or business professional but rather talented and somewhat of an early adopter or someone who will be helping the average accounting professional understand digital financial reports. As software improves, the complexity of digital financial reports will be absorbed by software. However, at this stage of the evolution of digital financial reports we have not reached the ease of use required for the average accountant to make use of digital financial reports.
- We assume that you understand the basics of the XBRL technical syntax. If this is not the case we would encourage the reader to become familiar with the XBRL technical syntax to get the most from this document. A good resource for the understanding of the XBRL technical syntax which the reader needs is chapter 4 An XBRL Primer in the book *XBRL for Dummies*[12].

[10] Understanding that XBRL-based Digital Financial Reports are made up of Distinct Identifiable Pieces, http://xbrl.squarespace.com/journal/2015/5/3/understanding-that-xbrl-based-digital-financial-reports-are.html

[11] See, http://xbrl.squarespace.com/blog-archive/

[12] *XBRL for Dummies*, http://xbrl.squarespace.com/xbrl-for-dummies/

- We assume that you understand financial reporting and will not explain fundamental financial reporting concepts and terminology.
- We assume that you will dig into the details of examples provided using good software. This will help you grasp important details. This is not a resource for understanding how to use any specific software application for the purpose of digital financial reporting.
- We assume that you are a hard worker. While we have accumulated a great deal of information, this resource is not perfect. Understanding digital financial reporting will take work.
- We are not saying that we have all of the answers. We do have a lot of very good questions, we have many interesting and enlightening observations, and we have figured some things out. We are working toward a world-class global standard solution for digital financial reporting.

1.7. Organization of this document

We have organized this resource into sections. Each section serves a specific purpose and fulfills a specific need for any business professional or information technology professional endeavoring to understand digital financial reporting.

It is key to have a sound understanding of the difference between basic notions such as *syntax* and *semantics* as well as the difference between *unstructured* and *structured* information, as an example. These first sections provide a grounding in the ***conceptual ideas and notations*** related to a digital financial report. This first section is more about general notions and the big picture.

Digitizing Financial Reports provides an overview of how we get from paper-based financial reports to digital financial reports. It also provides necessary background for understanding the differences between paper-based or electronic financial reports and digital financial reports. Understanding these differences is important because how you interact with digital financial reports will be different. The bottom line is that the workflow of professional accountants will change.

Overview of Accountants Perspective helps bring into focus things accountants should be thinking about as they endeavor to understand digital financial reporting.

Knowledge Engineering Basics for Accounting Professionals helps professional accountants learn a few things about "digital". Engineering is a way of thinking about something. Understanding basic concepts of knowledge engineering helps professional accountants communicate with information technology professionals and knowledge engineers.

Understanding Basic Mechanics of a Digital Financial Report helps set the big picture and establishes a foundation. **Understanding Mechanics of an SEC-type XBRL-based Digital Financial Report** expands on the general basics and builds on the basic foundation.

Understanding Advances Mechanics of a Financial Report is where things really start to get interesting. Building even more on the foundations which were established, this section exposes the true power of digital financial reports.

Differentiating US GAAP Alternatives from US GAAP Ambiguity helps professional accountants understand that they need to differentiate allowed alternatives and unintended alternatives. Understanding this key difference is

essential to determining how professional accountants desire to make use of structured formats such as XBRL.

Understanding Fundamental Accounting Concepts and Report Frames makes explicit and helps to establishes the cornerstones of digital financial reporting.

Understanding Other Moving Parts of Digital completes our journey of the conceptual and positions you for beginning practical, get your hands dirty, get under the hood interaction with digital.

Now you are ready for the details. You are ready to get your hands dirty. If you skipped the conceptual sections above, go back. You need to understand why you are doing what you are doing.

Resources for Getting Started point you to resources which will be useful as to undertake your journey.

Identifying Financial Reporting Domain Semantics sets the foundation for understanding what makes up a digital financial reports. What are the specific moving pieces of the puzzle? This section brings into consciousness things that accountants understand, but don't really think about. These things need to be put into a form so that computers can work with them in order for a computer to help accountants derive value from a digital approach to financial reporting.

Identifying Financial Reporting Domain Semantics explains the next layer of semantics about the financial report itself, semantics which relates to the financial reporting domain, the industry/activity, and semantics unique to the reporting entity. Very high level but specific examples are provided in order to help accountants grasp these critical ideas.

Identifying Financial Report Model Elements reconciles the model we will be using to the financial report semantics brought into consciousness in the previous section.

The **Identifying Relations Between Financial Report Model Elements** further explains the model by explaining the relations between the report elements described in the prior section.

Verification of Digital Financial Reports dives into helping you understand if a digital financial report is a true and fair representation and the representation which you intended.

One highly desirable result of expressing financial reports digitally is so the information can be more easily used by analysts. The section **Analysis and Comparison of Digital Financial Reports** covers important aspects of using digital financial reports.

Special or Specific Modeling Considerations dives into a little more specific examples related to digital financial reports.

Concept Arrangement Pattern Examples, **Business Use Case Examples**, **Comprehensive Example**, **Financial Disclosure Template Examples**, and **Reference Implementation of an XBRL-based SEC Financial Filing** sections provide a rich set of detailed examples you can use to further your understand this material.

Digital Financial Reporting Principles summarizes information that will help you become a digital financial report master craftsman.

1.8. Additional resources

Throughout this document sample files, examples, and other information is referenced. Each section will refer you to this additional information which is useful. All of this information is also summarized in one location which you can find here:

http://xbrl.squarespace.com/digital-financial-reporting/

We will also provide additional information, updated information, and otherwise provide additional resources you might need at this blog.

The following is other resources which you will likely find helpful:

- *Digital Financial Reporting Wiki* (http://digitalfinancialreporting.wikispaces.com/home) is where you can find updated information, downloads, examples, error corrections, etc.
- *Digital Financial Reporting Blog* (http://xbrl.squarespace.com) contains the most current information and other additional resources.
- *XBRL for Dummies* (http://xbrl.squarespace.com/xbrl-for-dummies) by Charles Hoffman and Liv Watson helps understand what XBRL is, what it is not, and provides good chapter, An XBRL Primer, which helps you understand the XBRL technical syntax should you want to delve into that. It also helps you understand how others are making use of XBRL and helps business readers understand the notion of a supply chain.
- *Financial Report Ontology* (http://xbrl.squarespace.com/financial-report-ontology/) is a collection of machine readable metadata and business rules useful in external financial reporting.
- *Arelle (http://arelle.org)* is a high quality, free, open source XBRL processor. For those who are more technical, this is a great resource. Business professionals, don't bother. Trying to make use of this will drive you nuts.

1.9. Where next

Digital financial reporting is just getting started. Many new opportunities will be created for accountants who learn to harness these new tools. Older tools will become less relevant.

Even though something like the SEC XBRL mandate does not affect you directly does not mean that you should not be proactive and that there is nothing that can be learned from the pioneers who are blazing the digital financial reporting trail.

Get some software, try things out, maybe even dig deeper into the details provided by links in this document, additional details provided within the appendices of this document, or resources you discover elsewhere.

1.10. Acknowledgements

While I did physically create the information in this resource, I could have not done so without the gracious help of a number of people, directly and indirectly, over the years. I see myself as merely a custodian of this important information, nurturing it along for the benefit of all, condensing countless discussions into something hopefully useful for the common good.

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There are others which I probably left off and for this I apologize. I acknowledge and appreciate the thinking others contributed to this endeavor.

2. Digitizing Financial Reports

Many things seem to be going digital[13]. The dawn of the era of digital financial reporting has arrived.

Digital technology has become an integral part of society and culture. If you have a camera, it is likely to be digital. If you are into music, you probably listen to it on your digital music player. You probably record your television programs on your digital video recorder and watch them whenever you want. You are likely to read your digital book on your Kindle or iPad. You probably look up information more on Wikipedia than you do in Encyclopedia Britannica. Internet stores like Amazon.com are changing how we buy, consume and research products. Social networking like Facebook.com and LinkedIn.com are changing how we relate to customers and colleagues. Google changes what we know and how we learn. Blogs change where we get our news from. Groupon has changed the way we think about coupons.

Financial statements too are going digital.

2.1. Understanding the term "digital financial report"

For about the past 100 years or so, financial reporting has been paper-based. It has been only within the last 25 to 30 years that financial reports have been created electronically using a word processor and then printed or saved to an electronic format such as PDF or HTML or simply printed on paper.

The information contained in electronic formats such as PDF and HTML can still only be read by humans. Information is structured for presentation, not meaning.

Digital financial reporting, in contrast, makes this information readable by both humans and computer software applications. Information is structured for meaning[14].

Such help from machines can reduce the time and therefore the costs of creating and consuming financial report information and at the same time improve the quality of a financial report.

With machine readability of financial reports, computer software application can read the reported financial information seemingly *understand* the information. Software can help make sure things like mathematical computations are correct and intact throughout the report. Automated software processes can compare reported information to mandated disclosure requirements and make sure the report creator complied with those requirements. Rather than a disclosure checklist being nothing more than a memory jogger for a manual process, disclosure checklists can be likewise digital and many here-to-for manual processes automated.

Here are some examples of the benefits of a digital financial report:

- Processes can be reliably automated because computers can reliably move information through the workflow. Linking digital financial information together based on the meaning of the information can be much more reliable than trying to link physical locations within spreadsheets, which commonly change.

[13] Digital Isn't Software, It's a Mindset, http://xbrl.squarespace.com/journal/2014/3/18/digital-isnt-software-it-is-a-mindset.html

[14] How XBRL Works video, https://www.youtube.com/watch?v=nATJBPOiTxM

- Ambiguity is reduced because for a computer to make use of the information, that information cannot be ambiguous. Making the information easy for a computer to understand also makes it easier for humans to communicate more effectively.
- Reported information can be easily reconfigured, reformatted and otherwise repurposed without rekeying to suit the specific needs of an analyst, investor, or regulator.
- Software can easily adapt itself to specific reporting scenarios and user preferences because it understands the information it is working with.

This is not to say that humans will no longer be involved in creating or consuming financial reports. Clearly, machines will never be able to exercise judgment, which remains something only humans can do.

And although all this may seem like magic, there is no magic is involved here. Instead, digital financial reporting relies on well-understood information technology practices, agreement on standard technical syntaxes and careful and clear articulation of already agreed-upon financial reporting rules in a form that computers can effectively understand.

Three things are necessary to make financial information, or any information for that matter, understandable by machines.

- First, you need a machine-readable technical syntax. In the case of financial reports, the Extensible Business Reporting Language (XBRL), a global standard format for expressing business information digitally is used.
- Second, you need machine-readable business domain rules (semantics), you need to express the semantics of the domain you want the computer to understand. Semantics has to do with meaning: what are the important things in a business domain, such as financial reporting, and what are the important relations between the things that a computer must understand.
- Third, you need machine-readable workflow rules, you need to express workflow or process rules so that the machines understand the correct protocol for exchanging and otherwise working with the information.

Ultimately, this is what the technical syntax, business domain semantics and process protocols are all about: exchanging information (such as financial information) from one business system to another and both systems correctly and consistently understanding that information in the same way - achieving a common understanding of the information.

The U.S. Securities and Exchange Commission (SEC) is a pioneer in digital financial reporting. In 2009, it mandated that every public company that files financial information with the SEC do so digitally using the XBRL technical syntax. Some business domain semantics have been expressed for both U.S. Generally Accepted Accounting Principles (US GAAP) and International Financial Reporting Standards (IFRS) in the form of XBRL taxonomies.

Digital financial reporting still has a long way to go, however. Just as other business domains such as healthcare work to create process improvements by digitizing medical records, for example, these initiatives take time, money and lots of effort. Plus, these state-of-the-art technologies must be proven to work correctly before business professionals can fully employ them.

For the past 15 years, organizations such as the American Institute of Certified Public Accountants (AICPA), the IFRS Foundation, software vendors and regulators such as the SEC have been working to create and perfect the necessary technical syntax, financial reporting domain semantics and workflow protocols to enable digital financial reporting.

Arguably, the boldest step toward digital financial reporting has been XBRL-based public company financial reporting to the SEC. Because of the nature of US GAAP, the sophistication and complexity of financial reports created by public companies, and the desire to make use of their financial information, this use of digital financial reporting is a real test of its viability.

2.2. Understanding the value proposition of structured information

As was said above, for 100 years or so financial reporting has been paper based. It was only in the last 25 to 30 years that financial reports have been created electronically in a word processor and then printed or saved to an electronic format such as PDF or HTML.

During the age of paper, paper-based spreadsheets were used to summarize, aggregate, or other organize detailed information which made its way to the financial report. Electronic spreadsheets replaced paper-based spreadsheets.

External financial reports can be required to be provided to a regulator such as the Securities and Exchange Commission (SEC), such is the case for public companies. Certain industries comply with the requirements of other regulators such as financial institutions provide financial information to the Federal Deposit Insurance Corporation (FDIC). Private companies provide external financial statements to commercial lending institutions in support of commercial loans. State and local governmental entities provide external financial statements to voters and to lenders who provide bonds and other financing. Not-for-profit entities provide financial statements in support of federal grants. These external financial statements may have different disclosures which are required, but they are all general purpose financial reports. The economic entities or accounting entities which create these general purpose financial reports must comply with specific reporting rules.

The flip side of compliance with the rules and regulations related to external financial reports is noncompliance. Noncompliance is a risk which is managed by those creating external financial reports. Machine-readable rules can help those creating financial reports comply with required reporting rules.

Because, historically, external financial reports were unstructured; there was no other way to ensure compliance then by throwing humans at the problem. Compliance involved humans doing lots of work; all the work really.

When information is structured, something very significant changes. While unstructured information is not understandable by machines such as computers; structured information can be understood[15]. How much can be understood is dependent on the nature of the structure. The richer and more expressive the representation structure, the more information that can be provided in machine

[15] How XBRL Works, https://www.youtube.com/watch?v=nATJBPOiTxM

readable form[16]. The more information provided in machine readable form, the more a machine can understand.

But the structure alone is not enough to provide much value to those creating external financial reports. When computer readable business rules[17] that articulate information about the structured information, very interesting things start to happen.

As I said earlier, humans were the only way to make sure the information of unstructured external financial reports were in compliance (correct, complete, accurate, and consistent).

When information is structured and when a rich set of machine-readable business rules is created, some of the tasks associated with compliance can be moved from manual tasks performed by humans to automated tasks performed by machines. How much which was manual can be automated? That depends on the structure and on the business rules created.

Why turn manual processes into automated processes? Why do auto makers use robots and other machines in the process of creating cars? Automation can be cheaper than humans in many cases. Machines make way fewer mistakes than humans when repetitive tasks are performed. Machines are faster than humans. Machines are more consistent, tolerances are tighter, quality can be better in certain areas.

Can 100% of the process of creating an external financial report be automated and performed by machines? No way. There is a tremendous amount of professional judgment which is required to create an external financial report. Tasks that require human judgment can never be automated. However, there are repetitive, mindless tasks that are also part of the external financial report creation process. Many of those tasks can be automated.

What are the benefits of successfully automating here-to-for manual tasks? This is the value proposition:

- Taking manual processes and automating those processes using structured information and machine readable business rules. This can save time, reduce costs, and improve quality.
- Taking complex tasks which require significant knowledge and reducing the knowledge which is required by having a machine assist the business user, supplementing that human's knowledge.
- Reducing the time needed to create an external financial report.
- Increasing the quality of the external business report by leveraging automation, thus reducing human error by reducing the tasks which humans perform.
- Reducing the risk of noncompliance.
- The discipline and rigor of defining the rules of the financial reporting conceptual framework in machine readable form causes an increase in the clarity of the business rules articulated over the current approach of defining

[16] Comparison of representation structures and relative automation/reasoning capacity, http://www.xbrlsite.com/2014/Library/ExpressivenessAndReasonaingCapacityComparison.jpg
[17] Understanding business rules, http://xbrl.squarespace.com/journal/2009/10/18/business-rules-what-are-they.html

these business rules in books which tend to have gaps, inconsistencies, ambiguities, duplication, etc[18].

Now, if you take current processes, leave those processes in place, and then try and structure information after the a financial report has been created it is very hard to grasp the value of structured information. But if you totally reengineered the process of creating an external financial report, the value is easy to understand.

How many business rules are we talking about? Many thousands potentially. Sound overwhelming? Well, those business rules already exist. They are organized in the brains of the humans who perform those manual processes. A human gets sick, a human finds a new job, knowledge leaves the organization. Machine readable business rules become part of the organization's knowledge base and internal processes. A significant amount of the value is the business rules themselves. Many of these business rules are documented, but documented in forms not readable by machines.

But what if these business rules were readable by both humans and machines?

Business professionals are in control of the metadata and business rules, not information technology departments. Applications are driven by models, metadata, and business rules. Rather than information technology departments hard coding rules which business professionals have to then rely on information technology departments to change when the business environment changes; business professionals reconfigure metadata and change business rules to adapt systems to new business circumstances. This is a new paradigm, machines driven by models and metadata controlled by business professionals.

Business professionals will work with software which has financial disclosure models[19] and financial disclosure processors. These software applications understand the structured information, metadata, and business rules. The software does not force business professionals to deal with the underlying technologies. Complexity[20] is hidden from business professionals by the models and processors.

Which technical syntax is used to structure information and articulate business rules is a secondary consideration. Global standard technical syntaxes are better than proprietary technical syntaxes. More expressive technical syntaxes are better than less expressive technical syntaxes. Internet enabled structured information is better than non-Internet enabled structured information.

Pressing the "Save as XBRL..." button is a secondary consideration. Whether the structured information is used for further analysis is a byproduct of properly creating the structured information. Using the information for analysis has nothing to do with whether structured information has value in the creation process.

If value can be created in the process of creating external financial reports, it is highly likely that value can be created in other domains using the same or similar technologies and techniques.

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[18] Differentiating Alternatives from Ambiguity in US GAAP, http://xbrl.squarespace.com/journal/2015/4/22/differentiating-alternatives-from-ambiguity-in-us-gaap.html

[19] Financial Report Semantics and Dynamics Theory, http://xbrl.squarespace.com/fin-report-sem-dyn-theory/

[20] Beating down complexity, http://xbrl.squarespace.com/journal/2014/6/14/beating-down-complexity.html

But to realize this value the system needs to work. The information created and exchanged to a consumer of the information must have the same meaning to creator and consumer. The system must be reliable and predictable. Processes must be repeatable and safe. This cannot be a guessing game if it is to be useful.

Achieving the value proposition is a choice. All the necessary technology exists.

2.3. Understanding the value proposition of actionable information

In 2008 both the global consultancy Gartner and leading benchmark research and advisory services firm Ventana Research released white papers which described inefficient corporate reporting process which they predicted would change. (See Gartner's *XBRL Will Enhance Corporate Disclosure and Corporate Performance Management* and Ventana's *Selecting the Right XBRL Solution: Addressing Compliance Requirements and Automating the External Reporting Process*.)

This is Ventana's description of the process:

> "Thus, the current close-to-file process is structurally prone to error. It poses a risk that mistakes and misstatements will occur. Most companies deal with this potential for errors and the risks they pose with a brute-force approach, using well-paid professionals (who could be doing more productive things) to check and double-check the documents. This might be a workable approach today, but it becomes increasingly difficult and costly as the amount of required tagging increases."

While being productive tools, spreadsheets, word processor documents, and desktop databases are wreaking havoc on organizations. The large number of spreadsheets, word processing documents, and desktop databases make up the highly manual, time consuming and error prone process they require is the approach of today.

XBRL part of the change, a trend, a paradigm shift toward model-based semantic structured authoring of business reports.

2.3.1. Digital business reports

Business system to business system information exchange is no easy task. Yet achieving this interoperability will result in new cost effective, easy to use, robust, reliable, repeatable, predictable, scalable, secure, auditable, business information exchange across business systems. Some business systems might be internal to your organization, others might be external to your organization.

A business user who has a business information exchange problem could always go to the information technology department and working with the information technology department solve any business information exchange problem. But these solutions care costly.

What if a business user, independent of the information technology department, could solve a business system to business system information exchange problem without having to trouble with the information technology department? That is what digital financial reporting is all about.

2.3.2. Digital business reports ends "spread sheet hell"

Business professionals love their spreadsheets. Information technology departments loth spreadsheets[21]. People point out the flaws of the electronic spreadsheet. For example, this web page points out the following 10 disadvantages of spreadsheets as being:

- Vulnerable to fraud
- Susceptible to trivial human errors
- Difficult to troubleshoot or test
- Obstructive to regulatory compliance
- Unfit for agile business practices
- Not designed for collaborative work
- Hard to consolidate
- Incapable of supporting quick decision making
- Unsuited for business continuity
- Scales poorly

An article published by Government Technology, *XBRL Ends Spreadsheet Hell*, explains how XBRL ended spreadsheet hell for a department within the state of Nevada. Kim Wallin, Nevada's controller says:

> "The goals were timely and accurate data, stronger internal controls, reduced costs, a standardized system of seamless data exchange, business processes and data elements. XBRL met all of those goals."

The article discusses two projects where XBRL was used to supplement what had been done with spreadsheets alone. One project related to the tracking of grants and the other relating to debt collection.

What if there were a new type of spreadsheet? Imagine a semantic spreadsheet[22].

2.3.3. Understanding the term actionable information

Actionable information is information from a trusted source about something that is important to you and once known to you will drive you to take some action.

The following is an example which helps explain what actionable information is by John Alber[23], *Delivering Actionable Information To Front-Line Lawyers*:

> "If a friend tells you that you have something in your teeth, chances are you'll visit a mirror and attend to the problem. That's actionable information. It is information (1) from a trusted source, (2) about something that's important to you, and (3) that, once known to you, will impel you to take action."

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[21] Time for a new take on the electronic spreadsheet, http://xbrl.squarespace.com/journal/2013/8/2/time-for-a-new-take-on-the-electronic-spreadsheet.html

[22] Understanding Cell Stores and NOLAP, the Future of the Spreadsheet, http://xbrl.squarespace.com/journal/2014/11/14/understanding-cell-stores-and-nolap-the-future-of-the-spread.html

[23] *Delivering Actionable Information To Front-Line Lawyers*, http://www.llrx.com/features/actionableinfo.htm

While the article talks about law firms, it has general applicability.

Ask yourself this question. In your organization, how does the mass of information which you have available become actionable? Is that process as efficient and as effective as it could be? If your organization is like most others, chances are that the process involves lots of reports, spreadsheets, re-keying, etc.

2.3.4. Understanding the structured information and metadata opportunity (or threat)

The move to digital financial reporting will cause a number of very significant shifts. One of these shifts relates to how metadata can be employed. This shift is both an opportunity and a threat. Most professional accountants and CPAs don't have a good enough grasp as to what metadata is or the role it plays. Therefore, nor do they understand the side of the shift equation on which they will end up.

This is what we mean.

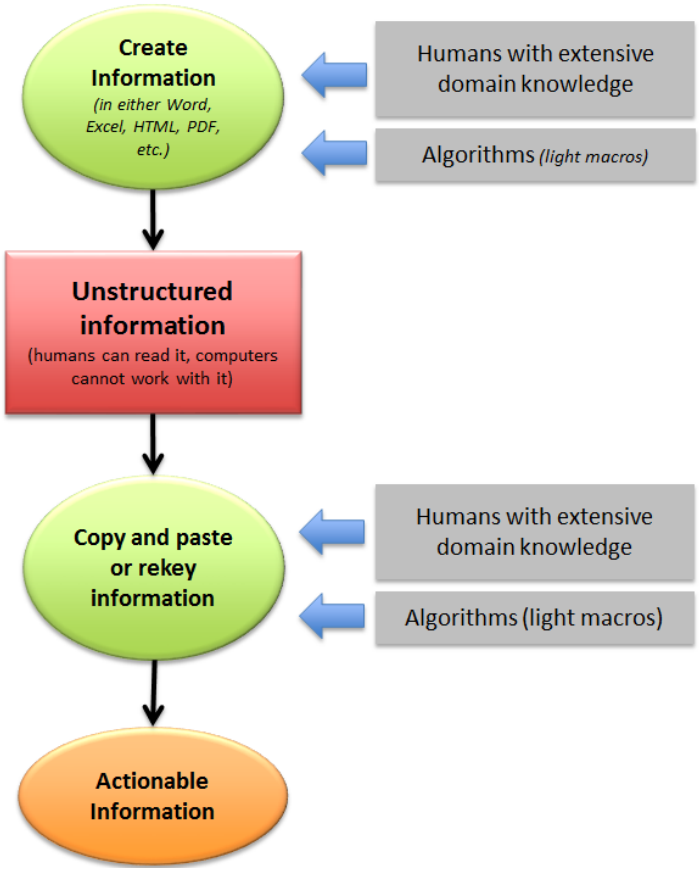
Let me use the external financial statement as an example. Most external financial statements today are created using Microsoft Word. I hear the number 85%. I am not talking about the balance sheet, income statement, and maybe cash flow statement which might be generated from an accounting or ERP system. I am talking about a complete external financial statement.

So, how much does Microsoft Word know about financial statements? You are probably thinking that this is a rather odd question; of course Word knows nothing about financial statements. The person creating the financial statement is the one which knows about financial statements; they use their knowledge of financial reporting and US GAAP or IFRS to create a financial statement using Word.

That is exactly the problem. In fact, it is two problems. The first problem is that Word cannot help you create that financial statement and get it correct. The second problem is that once the information is put into Word, because Word does not have any knowledge of the financial information within the financial statement; reusing that information involves humans, usually with domain knowledge, rekeying that information in order to make the information actionable.

The graphic below shows this has worked in the past (and likely how most people do this today):

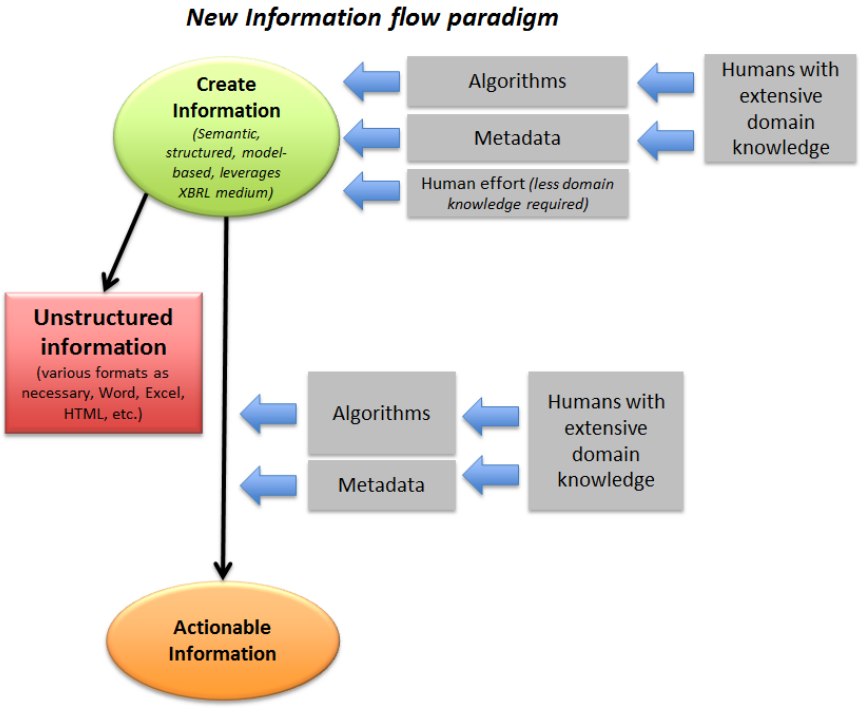
Information flow in past



But what if Word did understand financial statements? Well, Word my never understand external financial statements, but other applications will. You could get Word to understand financial statements by using its macro language, which is VBA and actually quite powerful, but more likely other applications will be created. And how might a software application understand a financial statement you might ask? The answer is machine-readable structured information and metadata. (To understand that statement is a journey, start here on that journey. This has the complete story. Once you see this in action, you will get it, get it.)

Basically information which you and other know about a domain such as financial reporting will be expressed in a form which a computer can understand. That is what the XBRL medium does; it expresses information in a structured form so a computer can understand it. Additional information, metadata, will be expressed which is helpful in working with that structured information.

Algorithms, or computer programs, will do stuff with that structured information and metadata. Lots of stuff. The graphic below shows this:



So two things will happen. First, who can create information and how they create that information will change dramatically. Because the computer can help the user, a less skilled person can do the work because the human knowledge is now expressed in the metadata. Second, automated reusing the information will become possible.

This will spiral, the possibilities widening and widening as more and more metadata and algorithms are created and employed.

What is the threat? If your skill is memorizing and regurgitating information, this is a threat. If your skill is rekeying information, this is a threat. Basically, think of what numerically controlled (NC) machines[24] did to the manufacturing process. Robots build a lot of stuff today using algorithms and metadata which control the machines which churn out consistent, higher quality output than humans can generally create.

The opportunity? Creating algorithms, creating metadata, doing value-add analysis of all that structured, model-based information.

And these opportunities and threats are not limited to external financial reporting, or even financial reporting. These same ideas can be applied to many, many other domains.

2.4. Evolution of financial report mediums

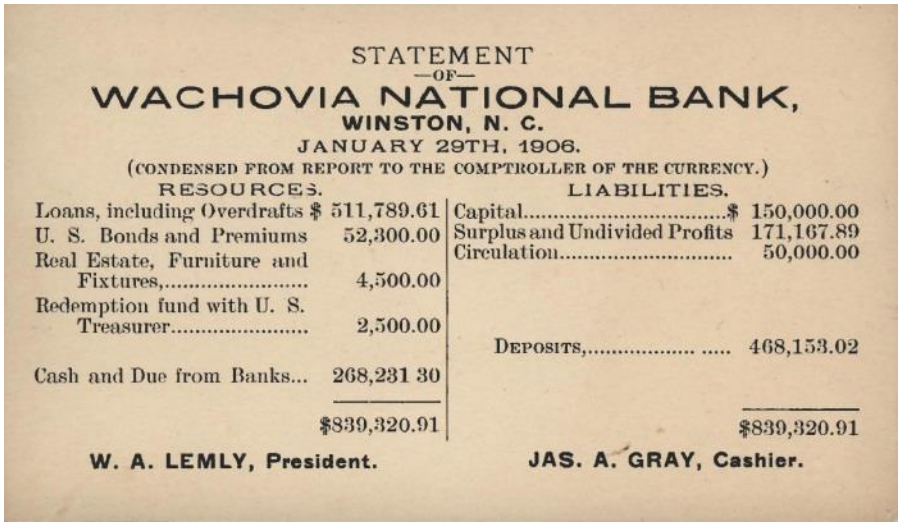
Things change. Below is a summary of the evolution of the financial report. Each of these examples shows a balance sheet.

First we show the annual balance sheet of a State-owned farm in Mesopotamia, drawn-up by the scribe responsible for artisans: detailed account of raw materials

[24] Numerically controlled machines, http://en.wikipedia.org/wiki/Numerical_control

and workdays for a basketry workshop. The medium is clay and this balance sheet was created in 2040 BC:

Here we show a 20th century balance sheet of Wachovia National Bank, 1906. The medium is paper.



STATEMENT
—OF—
WACHOVIA NATIONAL BANK,
WINSTON, N. C.
JANUARY 29TH, 1906.
(CONDENSED FROM REPORT TO THE COMPTROLLER OF THE CURRENCY.)

RESOURCES.		LIABILITIES.	
Loans, including Overdrafts	$ 511,789.61	Capital	$ 150,000.00
U. S. Bonds and Premiums	52,300.00	Surplus and Undivided Profits	171,167.89
Real Estate, Furniture and Fixtures	4,500.00	Circulation	50,000.00
Redemption fund with U. S. Treasurer	2,500.00		
		DEPOSITS	468,153.02
Cash and Due from Banks	268,231 30		
	$839,320.91		$839,320.91

W. A. LEMLY, President. JAS. A. GRAY, Cashier.

Next we see a Microsoft balance sheet (fragment), 1994, EDGAR system. (See http://www.sec.gov/Archives/edgar/data/789019/0000950109-94-000252.txt) This is from the early years of the SEC EDGAR system. The medium of this financial report is Structured Generalized Markup Language (SGML):

```
<PAGE>

MICROSOFT CORPORATION

Balance Sheets
(In millions)

<TABLE>
<CAPTION>
                                                  December 31      June 30
                                                    1993(1)          1993
                                                  -----------    -----------
<S>                                               <C>            <C>
Assets

Current assets:

   Cash and short-term investments                   $2,796         $2,290

   Accounts receivable - net                            460            338

   Inventories                                          130            127

   Other                                                 96             95
                                                    ------         ------
      Total current assets                           3,482          2,850

Property, plant, and equipment - net                    913            867

Other assets                                             91             88
                                                    ------         ------
        Total assets                                 $4,486         $3,805
                                                    ======         ======

Liabilities and stockholders' equity
```

Next we see a Microsoft balance sheet from an SEC filing in 2008 (see http://www.sec.gov/Archives/edgar/data/789019/000119312508089362/d10q.htm) which uses an HTML format:

MICROSOFT CORPORATION
BALANCE SHEETS
(In millions)

	March 31, 2008 (Unaudited)	June 30, 2007(1)
Assets		
Current assets:		
Cash and cash equivalents	$ 11,820	$ 6,111
Short-term investments (including securities pledged as collateral of $2,318 and $2,356)	14,521	17,300
Total cash, cash equivalents, and short-term investments	26,341	23,411
Accounts receivable, net of allowance for doubtful accounts of $147 and $117	9,871	11,338
Inventories	774	1,127
Deferred income taxes	1,721	1,899
Other	2,782	2,393
Total current assets	41,489	40,168
Property and equipment, net	5,516	4,350
Equity and other investments	8,659	10,117
Goodwill	10,346	4,760
Intangible assets, net	1,639	878
Deferred income taxes	1,367	1,389
Other long-term assets	1,731	1,509
Total assets	$ 70,747	$ 63,171
Liabilities and stockholders' equity		

Finally we see a 21st century balance sheet from Microsoft generated by the SEC interactive information viewer, 2012. The medium used to express this financial information is XBRL. The XBRL technical syntax is rendered by the SEC viewer. (see

http://www.sec.gov/Archives/edgar/data/789019/000119312512316848/0001193125-12-316848-index.htm)

MICROSOFT CORP (Filer) CIK: 0000789019

Print Document View Excel Document

- Cover
  - Document and Entity Information
- Financial Statements
  - Income Statements
  - Balance Sheets
  - Balance Sheets (Parenthetical)
  - Cash Flows Statements
  - Stockholders' Equity Statements
- Notes to Financial Statements
- Accounting Policies
- Notes Tables
- Notes Details

Balance Sheets (USD $) In Millions, unless otherwise specified	Jun. 30, 2012	Jun. 30, 2011
Current assets:		
Cash and Cash Equivalents	$ 6,938	$ 9,610
Short-term investments (including securities loaned of $785 and $1,181)	56,102	43,162
Total cash, cash equivalents, and short-term investments	63,040	52,772
Accounts receivable, net of allowance for doubtful accounts of $389 and $333	15,780	14,987
Inventories	1,137	1,372
Deferred income taxes	2,035	2,467
Other	3,092	3,320
Total current assets	85,084	74,918
Property and equipment, net of accumulated depreciation of $10,962 and $9,829	8,269	8,162
Equity and Other Investments	9,776	10,865
Goodwill	13,452	12,581
Intangible assets, net	3,170	744
Other long-term assets	1,520	1,434
Total assets	121,271	108,704
Current liabilities:		

There is a significant difference between the earlier financial reports and the new XBRL-based financial report. All versions prior to XBRL were only readable by humans. But the XBRL-based financial report is readable by humans when rendered as above, but also readable by computer software applications.

2.5. Understanding semantic-oriented, model-based digital financial report authoring

Semantic-oriented, model-based digital financial reporting approaches to financial reporting which employ technology to both improve the functionality of the financial report while at the same time reduce the costs of creating financial reports. Further, semantic, model-based digital financial reporting reduces the costs and increases the functionality of analysis of financial and non-financial information contained in those reports.

Understanding what a model-based digital financial report is can best be seen by looking at the evolution of a financial report.

- **Paper and pencil**. When business information is communicated on paper, the nature of the paper medium means that the report can be used by one person at a time, it cannot be changed in any way as it exists in one form, and the nature of the information on the report determines who needs to create that report in order to maintain quality of the information

communicated. Photo static copies of paper can be made to improve information distribution.

- **Computer**. Computers and the electronic spreadsheet improve financial reports created using paper and pencil in a number of ways. Information is unstructured, or more correctly structured only for presentation of information within a computer spreadsheet or word processing document. The formats are not standard and therefore cannot be exchanged with others unless they have the same software application as the creator of the information.
- **Electronic**. Taking computer generated financial reports a step further, the output formats can be standardized to say HTML or PDF and, leveraging the internet, distribute that information to anyone on the planet for pennies. While there is significant benefit to electronic distribution of business information, because the information is still unstructured (or more correctly structured for presentation and not meaning), information contained within the reports cannot be reliably reused or analyzed without a human's involvement.
- **Digital**. By digital we mean that the unstructured information is structured for meaning, many times using a global standard format, in some format which gives the information meaning. Because the information has meaning associated with it three things are possible. First, when the information is created software applications can assist in the process because the computer can read the structure and assist those creating such reports. Second, when the information is analyzed humans are not needed to move the information from its creation form into the form used for analysis, computers can use the structure to do that also. Third, rather than locking the created information into one form like paper, computer or electronic formats do, the information can be rendered in any number of forms. Further, within a software application using the information the information becomes more interactive, much like a pivot table of an electronic spreadsheet.

Semantic-oriented, model-based digital financial reporting is leveraging the structured nature and semantics of the information in order to help business professionals create, reuse, and/or analyze financial information. Order of magnitude improvements in quality and functionality are achieved and significant reductions in cost are experienced. These improvements in quality and functionality and reductions in cost are even greater if all those in the "chain" or creation, use, and reuse each have tools which leverages the digital characteristics described.

But for digital financial reporting to work correctly, information must be interpreted correctly, information must be clear, consistent, logically coherent, and otherwise unambiguous; information about the information must be articulated digitally so that computers can read and therefore use the information and relations correctly. Basically, there is no magic involved in this process. How to achieve these results are in no way mysterious. But, there are certain challenges which must be overcome.

As we will discuss in a later section, **cognitive computing** is the simulation or mimicking of human thought processes in a computerized model. Cognitive computing will make semantic-oriented, model-based digital financial reporting work. We will explain now in the section *Knowledge Engineering for Accounting Professionals*.

2.6. SEC primes the pump

About 12,000 companies submit their financial to the U.S. Securities and Exchange Commission (SEC) using the structured digital format XBRL (eXtensible Business Reporting Language). Over 5,000 mutual funds are submitting their financial reports to the SEC digitally. Approximately 9,000 banks submit their financial statements to the Federal Deposit Insurance Corporation (FDIC) digitally. This trend toward digital financial reporting is gaining momentum as the XBRL digital financial reporting format is being adopted by many different financial reporting channels around the world in Europe, India, China, Japan, Australia, South America, Canada, and many other locations around the world. While the number of digital filers is not known, it is in the millions and rapidly rising.

Yes, the undeniable reality is that financial reporting is going digital.

2.7. Ramifications and unexpected consequences of going digital

Changing to the digital medium has ramifications. Going digital will have expected positive ramifications and likely some unforeseen positive impacts. What needs to also be considered is undesirable negative impacts, particularly unforeseen negative impacts and unexpected consequences.

As pointed out earlier digital financial reporting and electronic financial reporting are not the same thing. Where electronic financial reporting is about transferring what amounts to an electronic version of a paper document from the creator of the document to the user of the document; the electronic document is created in pretty much the same manner as it had been for a hundred years. So, just creating electronic versions of the same documents have limited impact of information reported, more of the impact is distribution of reported information.

Digital financial reporting is different than a paper or electronic financial reporting. A digital financial report can be read and understood, to a degree, by a computer software application. While computers will never replace the judgment of professional accountants, there are many things that computer software can do to assist professional accountants. Processes for creating financial reports and many aspects of auditing will change significantly.

There is a fundamental change when the information is reported digitally. Just like when music is recorded on a CD or DVD or as an MP3, information is lost because something which is analog when converted to something digital tradeoffs are made. For music, the loss of fidelity is imperceptible to most. Some can tell a difference.

The question is, how will the move from paper or electronic to digital financial reports impact reported information and the ability of the consumer of that information to satisfy their needs? While the jury is still out and while all positive and negative impacts are not known; some impacts and related questions do exist.

2.7.1. Presented on the face of the financial statements

When financial reports were designed, they were designed with paper in mind. There are a number of drawbacks to communicating information using paper as the medium. Firstly, information on paper can only be organized one way, usually

through the author's lens. Secondly, the information communicated is constrained by the physical limits of each page of paper. The information presented on paper is two dimensional because the medium has two physical dimensions and rigidly structured in the same one way for all readers. It is only with great effort that authors can use the medium of paper to highlight exceptions, overlapping information, and make all meaning visible and explicit for the reader to absorb with a glance.

However, the world has changed. Not changed in the way that HTML, PDF or electronic paper have changed financial reporting, but changed in the way that we expect to consume music, movies, product ratings, coupons, and financial information. XBRL is referred to as "interactive data" by the SEC for a reason. The XBRL technical standard enables the ability to change the perspective of the information to be dynamic like a Microsoft Excel pivot table, and to have any number of organizations of the information contained within a financial statement.

Practices which were meaningful using the paper medium such as "presented on the face of the financial statements" are irrelevant if there is no face to the financial statements or if everything can be linked to other things and navigating from one spot in a financial statement, the "face", to another spot such as the disclosures or policies, is easy.

2.7.2.Filling in a box

One of the issues which the financial reporting community will need to address can be demonstrated by looking at the disclosure of significant accounting policies in XBRL-based public company financial filings to the SEC. The issue is a general issue, it relates to many areas of a financial report. There really is no "right" or "wrong" answer, there are just different approaches and each of those approaches has "functionality" which it delivers. You may, or may not, see this as a "change to financial reporting" or a "change in US GAAP". That is not the point of making this information available. The point is to help accountants to understand the issue.

The issue relates to the difference between unstructured information and structured information. With legacy approaches to creating a financial report the information disclosed is basically unstructured and therefore there is no "box" that information must fit into. You can understand "the box" by realizing that when you move from unstructured to structured information, you basically take the unstructured information, structure it in some way (thus creating the box), and you put the information into a box.

The "box" is not good or bad, it is just a box. It is not that unstructured is good and structured is bad; or that structured is good and unstructured is bad. They are just different.

So here is what I mean. If you understand financial reports, then you know that within a financial report, such as within an SEC financial filing, you have to disclose significant accounting policies. If you look at SEC XBRL financial filings (which I have, more info later) you will see that 100% of the 10-K filings disclose significant accounting policies. Reporting rules require this.

But, filers structure this disclosure using XBRL in different ways. Here are the primary ways I see this done (this is looking at only the [Text Block] or (Table) which every SEC filer provides in their SEC XBRL financial filing:

- Significant Accounting Policies (us-gaap:SignificantAccountingPoliciesTextBlock) is used most.
- Basis of Presentation and Significant Accounting Policies (us-gaap:BasisOfPresentationAndSignificantAccountingPoliciesTextBlock) is a distant second
- Business Description and Significant Accounting Policies us-gaap:BusinessDescriptionAndAccountingPoliciesTextBlock) is next
- Basis of Accounting (us-gaap:BasisOfAccounting)
- Organization, Consolidation, Basis of Presentation, Business Description and Accounting Policies (us-gaap:OrganizationConsolidationBasisOfPresentationBusinessDescriptionAndAccountingPoliciesTextBlock)
- Organization, Consolidation and Presentation of Financial Statements Disclosure and Significant Accounting Policies (us-gaap:OrganizationConsolidationAndPresentationOfFinancialStatementsDisclosureAndSignificantAccountingPoliciesTextBlock)

Now, some filers (very few) decide that none of those concepts work for them and decide to create extension concepts. Those are obviously errors and one of the existing concepts should have been used.

But, other filers combine different things together and do feel obliged to create an extension concept and it creating such a concept can be justified. For example, one filers created the concept "Summary of Significant Accounting Policies and Recent Accounting Pronouncements [Text Block]". They combined two things which both have concepts which exist in the US GAAP Taxonomy; but is this the right thing to do?

That is the issue. Basically, it is possible to come up with all sorts of permutations and combinations of information. Each permutation/combination needs to have a "box" or concept created so that the SEC filer can put the information inside that box. This is the way they have always reported.

But, the filer creating such a concept basically makes comparing information significantly more challenging. You can still do it; you just need to map the filer extension concept to some other concept which is defined to include significant accounting policies.

Or, alternatively, the filer could unbundle the information into the two concepts which exist; separating "Significant accounting policies" and "recent accounting pronouncements" into two separate boxes. This reduces the permutations and combinations.

So, it seems that the spectrum of options is as such:

- Provide lots and lots of permutations and combinations, and still allow a filer to create more permutations and combinations
- Provide lots and lots of permutations and combinations, but DON'T allow the filer to create other possible permutations/combinations
- Require SEC filers to unbundled their disclosures, and also their financial statement line items, into discrete disclosures/line items (i.e. get rid of the bundles)

Like I said, there is not necessarily a right or wrong answer here; it is just a choice which the financial reporting supply chain needs to figure out. What would be good is to understand the pros and cons of each alternative, all things considered.

And I point out again; this is not just an issue with significant accounting policies; it is a general issue for which I am pointing out with this significant accounting policies example.

2.7.3.Dance between implicit and explicit

Paper is a medium. XBRL is a medium. Each medium has different properties and features.

When you create an XBRL-based financial report you basically take all the information you want to report and you put it in what amounts to little boxes or structures. Many people erroneously refer to this process as "tagging" because software makes it seem like you are putting tags on information which exists within some document. But what you are actually doing is constructing a model. You are representing information.

When a human reads a paper financial report, there is a tremendous amount of implied message which gets communicated. Structuring information and expressing that information using a model, effectively digitizing the information, can have both positive and negative impacts. By explicitly structuring the content of a financial report, by having to put everything into some structure, and by articulating how that structure are related to other structures, that financial statement presents become more crystallized. In other words, the financial concepts disclosed in the financial statement become more explicit and the relationships between the financial concepts are made explicit. This results in greater precision in the story that is being told by the financial statement. Explicit information is more ridged.

On the other hand by having to put all the information of a financial report into structures, if not done correctly the desired flow of the report can be lost. Further, humans are quite good at implying important meaning which can be gleaned from a financial report. No computer will ever be able to imply what humans can imply.

Implicit context changes as culture changes. We as professional accountants need to both understand and become masters of the "dance of implicit and explicit" as David Weinberger calls it in his book *Everything is Miscellaneous*. Computers can do a lot for us in terms of rearranging things, providing flexibility, changing the way we relate to a financial statement. Computers also only deal with exactly what they have been told. Computers are not as adept at all at dealing with what has been left unsaid.

Making complex, meaningful financial information explicit can lead to oversimplification and perhaps result in incomplete, inappropriate, and misleading financial information. Professional accountants should be conscious of this possibility, rather than unconscious. The optimal equilibrium in the implicit/explicit trade-off needs to be fleshed out by the accounting profession.

2.8. Mastering the digital medium

In order for digital financial reporting to be adopted accountants will need to master the digital medium. How the digital medium works, the fact that it does in fact work,

how to get the digital medium to work appropriately all things considered, what appropriate means, are only some of the things which must be understood.

The move to digital financial reporting will be an evolution. Some financial reporting supply chains will move faster than others. But others will move:

- Private companies
- State and local governmental entities
- Not-for-profits

Collaboration and cooperation between members of the financial reporting supply chain is necessary to make digital financial reporting work.

2.9. Digital financial reporting means change, but to what?

Yet not enough professional accountants are engaged in this conversion process, thinking through the many relevant issues and there is a risk the accounting profession will not get what it desires as a result. The question is, what should moving from paper or electronic paper to digital mean for the public accounting industry and the CPAs/auditors who make up that profession.

Just like the change from film to digital photography meant big changes to what type of cameras were made, the workflow of creating a photograph, and the skills needed to be a photographer; changing to digital financial reporting will mean change.

2.10. Road work ahead: last mile of finance

The trend toward digital financial reporting is an enabler and only part of an even bigger trend. The bigger trend is to use the standardization and other characteristics enabled by having everything in a digital form structured for meaning to make processes better, faster, and cheaper throughout financial reporting. Technologies such as cheap internet access, the free XBRL global standard, mobile/iPad-type information appliances, business process management, business intelligence applications, and many others are converging, enabling financial reporting processes to be overhauled. The digital financial statement is only one small part of this much larger inevitable change.

Information will flow from its point of entry into a system through that entire system and then out again into some other business system, be that system one of a business partner, a government regulator, a financial institution which is providing your business with a line of credit, or other user of your financial information.

It looks like there is road work ahead for the "last mile of finance". In an FSN article, *Tagetik goes head to head with Oracle and Clarity (now IBM) in the 'Last Mile' of Finance* the IBM acquisition of Clarity is hailed as a wakeup call:

> "The IBM deal is a wakeup call to the market – expect to see much activity in this space over the coming year."

I am hearing terms that I have never heard before: Disclosure Management and Collaborative Disclosure Management (CDM). This seems to be a new class of software.

While business intelligence (BI) software was generally used for consuming information, this new class of software is for creating information. Enterprise

Performance Management (EPM) seems to be the buzz word for consuming financial information.

Oracle Hyperion Disclosure Management and Oracle Hyperion Financial Close Management work in conjunction with other Oracle EPM applications such as Hyperion Financial Management or can be deployed directly with ERP General Ledger systems. SAP has its offerings for reporting. IBM with their acquisition of Clarity means they are in the game.

Those names you have likely heard before. It seems like every day we get the name of another software product that either can be used to create financial information or consume financial information. Here are some: Information Builders, Tagetik, Quantrix, WebFilings, Trintech and Longview Solutions. There are likely many others.

In 2008 Gartner and Ventana Research white papers described inefficient corporate reporting processes which they predicted would change. (See Gartner's *XBRL Will Enhance Corporate Disclosure and Corporate Performance Management* and Ventana's *Selecting the Right XBRL Solution: Addressing Compliance Requirements and Automating the External Reporting Process*.) This is Ventana's description of the process:

> "Thus, the current close-to-file process is structurally prone to error. It poses a risk that mistakes and misstatements will occur. Most companies deal with this potential for errors and the risks they pose with a brute-force approach, using well-paid professionals (who could be doing more productive things) to check and double-check the documents. This might be a workable approach today, but it becomes increasingly difficult and costly as the amount of required tagging increases."

This large number of spreadsheets and word processing documents and the highly manual, time consuming and error prone process they require is the approach of today. It is like a dirt road. The tools of the future will be more like an interstate freeway.

While external financial reporting and regulatory reporting are paving the way, the change which will occur will impact all financial reporting, not just financial reporting.

XBRL is only part of the change or maybe even call it a trend. We are hearing the term "model based reporting" come up. This is a new way to think about financial reporting. The electronic spreadsheet was a significant improvement over the paper-based spreadsheet. These new tools will be an improvement to the electronic spreadsheet.

So get your hard hats: road work ahead.

2.11. Understand digital financial reporting to remain relevant

Digital financial reporting is here to stay. To remain relevant, professional accountants and other accountants need to adjust their thinking about how to appropriately modify financial reporting to keep up with the digital revolution. The value standardization offers business is undeniable: lower costs, increased leverage, and improved quality. Professional accountants need to better embrace changes which are inevitable to products professional accountants offer and processes professional accountants use to deliver those products. In doing so, professional

accountants can continue to contribute to the market, their clients, and their enterprises.

For example, a Journal of Accountancy article *FASB sees flexibility, relevance as cures to disclosure overload*[25] states that the FASB is asking for feedback on whether ordering and formatting should be:

- Flexible and based on relationships of particular items;
- Flexible and based on the importance of particular disclosures; or
- Fixed and uniform.

With technologies such as XBRL which allow financial information to be expressed digitally is there really a need to make a choice? Is this list of options a remnant of thinking using constraints of old paradigms which are no longer applicable in a digital world? Why can't the user of financial information have all three options available and the user can pick which approach is best for them given their preferences and their perceived needs?

[25] *FASB sees flexibility, relevance as cures to disclosure overload*, http://www.journalofaccountancy.com/news/2012/sep/20126364.html

3. Overview of Professional Accountant's Perspective

This section provides an overview of important information related to the perspective of an accounting manager or member of a team creating a financial report, an internal auditor or third party auditor evaluating such a report, a CFO signing off on such a report, or an audit committee evaluating the information expressed within a financial report. This information is not a comprehensive summary of all considerations; rather it is a brief overview of considerations which would generally not be disputed.

> HINT: It is very important to recognize that the historical mediums used to express financial information such as paper and electronic forms of paper such as HTML or PDF are structured for presentation of information and therefore only understandable by humans. They were not structured to represent the meaning of the information. Digital mediums such as XBRL are structured to represent meaning and are therefore readable by machines such as computers. The meaning can also be used to present the information as desired. Understanding these differences helps professional accountants understand how to best employ these new mediums.

3.1. Financial reports tell a story

A financial report tells a story. The story which is communicated by a financial report does not change based on the medium used to tell that story. The meaning of the financial information articulated by the creator of the financial report and the meaning of the financial information derived by the users of the financial report should be the same. Both the creator and consumer should walk away with the same message or story. Creators of a financial report go to great lengths to tell the story which they believe best reflects the financial condition and financial position of the reporting economic entity providing the financial report.

Creators and users of a financial report are free to interpret the information communicated by the message/story of that financial report as they see fit. But, the information itself should be identical for both the creator and user. Reported information is facts. For example, if a fact is reported and the fact is deemed to relate to the consolidated entity, be as of December 31, 2014, for the US GAAP concept "Cash and cash equivalents", being expressed in US dollars; then the derived meaning and understanding should not be in dispute between two different parties who are using the same piece of financial information. However, any party is free to interpret the facts as they deem appropriate.

3.2. Separating facts from opinions

Senator Daniel Patrick Moynihan said: "Every man is entitled to his own opinion, but not to his own facts." Both **facts** and **opinions** exist within financial reports.

There are at least three separate questions which must be answered by an accountant creating a disclosure for, or presenting information within a financial report. Understanding these three questions and separating them in one's mind helps one express the financial information using digital medium appropriately.

The first question is, "Which disclosure(s) are appropriate?" This question requires professional judgment and can only be correctly answered by a qualified, trained professional accountant. The answer to the question tends to be part fact and part opinion. The second question, "How is the information best placed, shown and/or formatted within the financial report?" The answer to this question tends to be more based on arbitrary personal preference and therefore is more subjective than based on fact. The third question, "Given a certain disclosure, what is the information being disclosed and how does it relate to other information?" The answer to this question tends to be more objective than subjective and is governed by rules of logic and mathematics.

In fact, the financial reporting conceptual framework explicitly tries to make financial report disclosure as objective as possible. You can see this in the goals articulated for the conceptual framework (per the FASB Special Report, *The Framework of Financial Accounting Concepts and Standards* (1998):

- Providing a set of common premises as a basis for discussion
- Provide precise terminology
- Helping to ask the right questions
- Limiting areas of judgment and discretion and excluding from consideration potential solutions that are in conflict with it
- Imposing intellectual discipline on what traditionally has been a subjective and ad hoc reasoning process

To put these questions in more concrete terms we will use an example. Say a reporting entity must release a financial report. The accountant can pick between options such as providing a balance sheet or a statement of net assets. Industry practice, common practice, and rules and regulations all come into play with this choice between available options. Further, the accountant knows that he or she is required to provide a cash flow statement; but that accountant can pick between using the direct method or the indirect method to create that cash flow statement, that is subjective.

But if a balance sheet is chosen by the accountant, then assets must be provided, liabilities and equity must be provided, and assets must equal liabilities and equity on that balance sheet. The model of the balance sheet is known and an accountant has no latitude and gets no voice in saying what a balance sheet is; regulators and standards setters dictate those rules. Accountants and the financial information which exists can determine many of the line items which are appropriate for the balance sheet. These mechanics of a balance sheet are well understood by accountants, although they may not necessarily think of balance sheets in this way.

Other items are purely objective. For example, the accountant can choose to format zeros by showing a blank, showing a "0" or showing "-"; but the meaning is always the same, zero.

Understanding the distinction between what is a fact and what is an opinion helps accountants understand things that they can decide and where they simply need to follow the rules.

A *fact* is a statement that can be proven to be true or false using logic or evidence. A fact is something that exists and is objective. An *opinion* is a statement or expression of a person's feelings. Opinions indicate a belief. Opinions cannot really be proven, only expressed. Opinions are subjective. Opinions can be based on facts, preferences, beliefs, interpretations, emotions, and even desired outcomes.

Opinions can be meant to deliberately mislead others. Including certain facts, excluding certain facts, or misrepresenting facts are tactics for expressing an opinion.

Sometimes there may be a fuzzy line between a fact and an opinion. Sometimes there are fuzzy lines between allowed accounting rule alternatives and ambiguity in the financial reporting standards. Allowed alternatives and unintended ambiguity are not the same thing.

How digital mediums work, such as the XBRL medium, is based on facts, and indeed must be based on only the facts. XBRL is a global technical specification, an agreement on how XBRL works, technical specifications are objective.

3.3. Facts are more important than organization or formatting

What is more important to report, the facts themselves including the "packaging" such as formatting, or just the facts?

For example, a Journal of Accountancy article *FASB sees flexibility, relevance as cures to disclosure overload*[26] states that the FASB is asking for feedback on whether ordering and formatting should be:

- Flexible and based on relationships of particular items;
- Flexible and based on the importance of particular disclosures; or
- Fixed and uniform.

With technologies such as XBRL which allow financial information to be expressed digitally is there really a need to make a choice? All three options are possible at the same time. Is this list of options a remnant of the way of thinking constrained by old paradigms which are no longer applicable in a digital world? Why can't the user of financial information have all three options available and the user can pick which reported facts are appropriate for their use of the information and which approach is best for them given their preferences and their perceived needs?

3.4. True and fair representation of financial information

Clearly the financial information provided by a reporting entity should not be "untrue" or "unfair". As such, by definition it should be "true" and "fair". Based on the rules, regulations, and common practices which exist; based on the informed professional judgment of the accounting team expressing the financial information; and considering all the other factors which must be considered when a reporting entity expresses its financial information, tells its story; that story should obviously be a true and fair representation of such financial information.

The story itself and the medium used to tell the story are two different pieces of the same puzzle.

Accounting teams are responsible for creating and verifying for themselves that they have created a true and fair representation of their financial information, regardless of which medium is used to express that information. And, regardless of which medium is used, that information must be: complete, correct, consistent, accurate. Each reported fact must have fidelity, which is to be a faithful representation. The set of all facts must fit together appropriately, the integrity must be sound.

[26] *FASB sees flexibility, relevance as cures to disclosure overload*, http://www.journalofaccountancy.com/news/2012/sep/20126364.html

Considered holistically from all points of view, the multiple pieces of the system work together correctly, all things considered. If this is true and a report possesses these characteristics, and if it is true and fair, it is then considered to be a "valid" or desired result. The financial report can be considered a desired result, free from logical flaws, based on sound reasoning, in other words cogent.

Verification is the process of asserting truths and understanding for oneself that information is valid per those assertions. Verification can be internal, external, and/or independent third-party verification. Verification can be performed by humans manually, or verification can be performed by computers using automated processes. Automated verification tends to be cheaper and more reliable than human verification.

3.5. Quantitative and qualitative; objective and subjective

Reporting entities have flexibility to provide/present disclosures differently as long as all the required disclosures are met and other compliance rules are complied with. The primary financial statements and notes to the financial statements are an organization or presentation of required disclosures.

Accountants creating financial reports use both **quantitative measures** and **qualitative measures** to provide such disclosures.

"*Quantitative measures*" means that you use an actual number to disclose an amount or to show a change. For example, "net income for the year was $1,000,000" is a quantitative measure.

"*Qualitative measures*" means not showing an actual number, but rather providing information in other ways such as using relative terms. For example, disclosing an entity's objective for holding or issuing derivative instruments, background information necessary for understanding those instruments, strategies used to meet those objectives, and information helpful in understanding derivative activity is a qualitative measure.

Some disclosures tend to be rather **objective** in nature requiring little professional judgment. Other disclosures can be quite **subjective**, calling on a professional accountant to use their experience and judgment to provide the appropriate useful information.

"*Objective*" means that judgment is based on the facts of the situation and are not based on or influenced by personal feelings, preferences, tastes, or opinions. For example, the fact that balance sheets are included in financial reports and assets are part of a balance sheet is objective and there is no room for judgment.

"*Subjective*" means that judgment can be based on or influenced by personal feelings, preferences, tastes, or opinions. For example, whether a certain subsequent event is material and how to best disclose that event can be subjective, requiring significant professional judgment.

The overarching guidance to disclosing information is whether that information is **useful** in making decisions. To be useful, the information possesses the following characteristics: **relevance**, **reliability**, **comparability**, and **consistency**.

"*Relevance*" means that the financial information makes a difference when making a decision. The information matters.

"*Reliability*" means that the financial information is free from bias and errors.

"*Comparability*" means that a standard set of financial reporting principles are used. But given options, reporting entities are free to choose between allowed alternatives. For example, one company might use FIFO for valuing inventories and another uses LIFO.

"*Consistency*" means that a reporting entity uses the same standard accounting principle and reporting approach/method from period to period. For example, a reporting entity cannot flip-flop between FIFO and LIFO.

A few specific aspects relating to comparability and consistency are worth pointing out because they are often confused. Users of financial information often expect that every aspect of every reporting entity's financial report be comparable to every other reporting entity's financial reports. This is simply not the case. Financial reports are not, and should not, be a 'form' which is filled in by an accountant. One strength of US GAAP is its ability to let reporting entities report useful information specific to that entity.

Financial information reported by entities in the same industry sector tends to be more comparable than financial information reported by entities in different industry sectors.

A reporting entity's disclosures from period to period tend to be very comparable. While what disclosure information is considered useful by a given reporting entity for a given event, transaction, or other circumstance; once the disclosure approach is selected then the company specific disclosure of that information from period to period tends to be very consistent and comparable for any given reporting entity.

Accountants creating a financial report use disclosure rules/requirements, guiding principles, and their judgment when weaving together an appropriate financial report.

Some financial report disclosures tend to take the shape of very specific and objective quantitative measures. For example, the disclosure of earnings per share is an example of such a specific quantitative measure. These sorts of disclosures are like an "on/off" switch; either the disclosure is required or it is not and if it is required, what must be presented or disclosed is crystal clear. There may be judgment involved in computing or measuring the amount disclosed, but the need for the disclosure itself tends to be objective.

Other disclosures take the shape of being more subjective in nature and use more qualitative measures. For example in the derivative instruments example used above, the meaning of a business acquisition or divestiture to the overall financial position of a reporting entity and/or which information about the acquisition or divestiture is the important information depends on many different criteria and it is the role of professional accountants to exercise their judgment and determine the appropriate disclosures, all things considered, using known guiding principles.

Understanding which disclosures tend to take which shape and otherwise understanding these moving pieces is critical for financial report taxonomy creation, financial report creation, and analysis of financial information expressed by these taxonomies and financial reports.

There are times when a certain specific financial disclosure in two different financial reports will be very different, each reporting different facts. Both financial disclosures being appropriate for the circumstances and both satisfy prescribed disclosure rules/requirements, both being useful, etc.

Other times facts disclosed should be identical for reporting entities.

3.6. Identifiable, definitive, discrete set of pieces

The information contained within any financial report is an identifiable, definitive, discrete set of reported facts. Those facts have an identifiable, definitive, discrete set of characteristics. Those facts and characteristics have an identifiable, definitive, discrete set of relations between other facts. Those facts and characteristics have an identifiable, definitive, discrete set of properties. These facts, characteristics, properties, and their relations must be clear, consistent, logically coherent, and unambiguous (as opposed to vague, inconsistent, incoherent, and ambiguous).

While determining what must be reported and how it is reported can at times be subjective in nature and require significant professional judgment; once that judgment has been exercised and once the information is provided the facts, characteristics, relations, and properties of that reported information is in no way subjective and open to judgment.

All facts, characteristics, relations, and properties can be identified; they are physical objects which can be observed. As such, they are objective. The mechanics of the objects which comprise a financial report are not a mystery; rather, they tend to be well understood.

Below is a summary of the risks which could lead to a financial report being invalid and the risk mitigation assertion or verification task which would assure that the risk goes unrealized. Terminology of the *Financial Report Semantics and Dynamics Theory*[27] is used to clearly state the report objects, relations, and properties which must be examined either using automated processes or manual processes to verify that object property. The risk and mitigation is independent of whether the verification task is performed by a party which is or is not independent.

Risk	Risk Mitigation Assertion (Verification task)
Full inclusion: All relevant facts, characteristics which describe facts, parenthetical explanations of facts, and relations between facts/characteristics are not included in the financial report.	**Completeness**: All relevant facts, characteristics of facts, parenthetical explanations of facts, and relations between facts/characteristics have been included.
False inclusion: No facts, characteristics which describe facts, parenthetical explanations of facts, or relations between facts/characteristics which should not be included have been included.	**Existence**: No facts, characteristics which describe facts, parenthetical explanations of facts, relations between facts/characteristics are included within financial report which should not be included.
Inaccuracy: Property of a fact, characteristic, component, or relation is inaccurate. *(For example, mathematical relations and model logical structure relations.)*	**Accuracy**: The properties of all facts, characteristics, components, parenthetical explanations, relations between facts/characteristics which are included in the financial report are accurate, correct, and complete.

[27] *Financial Report Semantics and Dynamics Theory*, http://xbrl.squarespace.com/fin-report-sem-dyn-theory/

Risk	Risk Mitigation Assertion (Verification task)
Infidelity: All facts, characteristics, parenthetical explanations, and relations considered as a whole do not possess the required fidelity when considered as a whole.	**Fidelity**: Considered as a whole; the facts, characteristics, parenthetical explanations, and relations between facts/characteristics properly reproduces the financial and nonfinancial facts, characteristics, and relations of the reporting entity and provide a true and fair representation of such financial information. Fidelity = faithful representation.
Integrity not intact: Integrity between facts/characteristics is inappropriate.	**Integrity**: Considered as a whole, the facts and characteristics of those facts reflect the true and proper relations between such facts and characteristics.
Inconsistency: The facts, characteristics, parenthetical explanations, relations and their properties expressed are inconsistent with prior reporting periods or with peers of the reporting entity.	**Consistency**: The facts, characteristics, parenthetical explanations, relations between facts/characteristics, and their properties are consistent with prior periods and with the reporting entities peers, as is deemed appropriate.
Not presented fairly: The financial report is not presented fairly, in all material respects, and are not a true and fair representation in accordance with the financial reporting framework applied.	**True and fair representation**: The financial report is a true and fair representation of the information of the reporting entity. An auditor might say presented fairly, in all material respects, and provide a true and fair representation in accordance with the financial reporting framework applied (US GAAP, IFRS, etc.).

3.7. Many aspects of financial reporting are standardized

Financial statement disclosures, in some cases should be a hand-crafted work of art, but not in most cases. Most professional accountants do not desire to be artists; rather they endeavor to comply with financial reporting rules. There are some required disclosures. Other disclosures are required if a reporting entity reports certain specific financial statement line items. Other financial statement disclosures are required if the financial statement line item has certain specific characteristics. Other financial statement disclosures are common practice or purely optional. This information can be organized in different ways. Financial statement disclosures are not random.

As there are price differences between hand-crafted furniture and the furniture which you might purchase at, say, IKEA or at a high end furniture store; there are likewise different prices or costs incurred to taking different approaches to creating financial statement disclosures.

Generally disclosures for financial statement accounts are made if a line item of such account appears on a primary financial statement.

> HINT: Jon Rowden and Mike Willis make the following statement in their white paper *Making Sense of XBRL In the US and the UK*[28], "The accountants' skill and expertise can then be applied to and focused on disclosures where there is a problem, rather than turning each disclosure note into something resembling the accounting equivalent of a hand-crafted work of art."

[28] Making Sense of XBRL in the US and the UK, http://searchworks.stanford.edu/view/9320284

Not every part of a financial report needs to be a hand-crafted work of art. Some do. That is where accountants need to spend the majority of their focus.

3.8. Financial reporting is getting increasingly complex

Financial reporting is complex and the trend is to become even more complex. Transactions are becoming increasingly complicated, products and services of reporting entities get more and more complex, and financial instruments become more complicated[29]. Technology can contribute to simplifying financial reporting.

[29] *Will simpler also be better?*, http://www.journalofaccountancy.com/issues/2015/apr/financial-reporting-auditing-complexity.html

4. Knowledge Engineering Basics for Accounting Professionals

Computers sometimes seem to perform magic. But computers are simply machines. Computers do not create that magic. Skilled craftsmen who wield their tools effectively is how the magic is created. Computers simply follow instructions. Computer science is to domain in which information technologies operate. Notice the "science" part of the term computer science. Ultimately making a computer perform work distills down to logic and mathematics.

Digital has positive characteristics, but just like anything else it also has negative or less favorable characteristics. What does *digital* mean? How does *digital* work? How does the financial reporting supply chain want *digital* to work? Professional accountants cannot afford to be ignorant of how to make *digital* work the way they want digital to work for them. Becoming skilled in the science and art of digital is crucial for professional accountants.

It is important to define the term engineering. Engineering is the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of something." Building a bridge and engineering a bridge are different things.

Bridges are engineered when they are constructed. Engineering is the skillful construction or creation of something leveraging known laws of how things interact with one another. A civil engineer does not simply throw concrete and steel together to construct a bridge. The bridge is engineered to balance cost, strength, likelihood that the bridge remains standing during high winds or an earthquake, etc. Likewise when we work with information using a computer, how we achieve our goals and objectives is an engineering process, not simply throwing a few things together. That process is often referred to as knowledge engineering.

In order to understand how to get computers to perform work, you need to understand how computers work. You have to understand some basics of knowledge engineering.

4.1. Understanding cognitive computing

The article, *What is cognitive computing? IBM Watson as an example*[30], points out what it claims to be the three eras of computing:

- First era, tabulating systems (1900),
- Second era, programmable systems (1950),
- Third era, cognitive computing.

Many people tend to miss a really important point when it comes to XBRL. They look at XBRL as "tagging" and they equate XBRL to the "barcode". But, turn the equation around. What would it mean if all financial information were properly bar coded? What could you do? What would that enable?

[30] *What is cognitive computing? IBM Watson as an example*, http://www.duperrin.com/english/2014/05/27/whats-cognitive-computing-ibm-watson-example/

Think about it: What would happen if you took financial reports and rather than reporting information in an unstructured format that only machines could understand (because the information is unstructured or more accurately structured for presentation); but rather reported information was in a structured format both humans and machines could read and understand? What exactly would that mean?

Cognitive computing is the simulation of human thought processes in a computerized model.

Notice the word simulation. Computers cannot think; they are dumb beasts. But these dumb beasts can be made to mimic the human thought process, if you understand how to harness the power of a computer. If you know how to harness the power of a computer, you can make a computer seem to perform magic.

Computers do not create the magic. Skilled craftsmen who wield their tools effectively are what create the magic. Commuters simply follow instructions.

This article, *Cognitive Computing and Semantic Technology: When Worlds Connect*[31], points out something that is really important in two key statements in that article:

First:

> For cognitive computing to achieve its promise we need a thick metadata layer that incorporate semantic tagging formats.

Second:

> A lot of the focus is on machine learning, especially as things move to really analyzing and building explicit knowledge models, but other areas that should be included in the cognitive computing mix include constructive ontologies and constructive knowledge modeling, whether it's done by groups or individuals or crowd-sourced in the case of the semantic web.

So, what is not in dispute is the need for a "thick metadata layer" in order for the computer to be able to perform useful work. But what is sometimes disputed, it seems, is HOW to get that thick metadata layer. There are two basic approaches:

- **Have the computer figure out what the metadata is**: This approach uses artificial intelligence, machine learning, and other high-tech approaches to detecting patterns and figuring out the metadata.
- **Tell the computer what the metadata is**: This approach leverages business domain experts and knowledge engineers to piece together the metadata so that the metadata becomes available.

As a professional accountant, I understand that the probability of a computer starting from scratch and using the most sophisticated technologies and approaches available today and creating any useful metadata is very close to zero. However, the more manually created metadata that a computer has to work with, the higher the probability that the computer would be helpful in correctly figuring out financial reporting metadata.

So what I am saying is that humans are going to have to prime the pump and get quite a lot of metadata pieced together. Then at some point and for some things, computers can effectively be used to contribute more metadata. And so, this is not

[31] *Cognitive Computing and Semantic Technology: When Worlds Connect*, http://www.dataversity.net/cognitive-computing-semantic-technology-worlds-connect/

an either-or question. Both approaches can be used effectively and contribute to what is needed to realize the potential offered by cognitive computing.

Computers assisting professional accountants in correctly representing financial reports digitally will cause high-quality financial information to be available for analysis by investors and regulators. Everyone in the financial reporting supply chain will benefit from the meaningful exchange of financial information in machine-readable formats.

Concept computing will contribute to changing how financial reports are created similar to how CAD/CAM contributed to how blueprints are created and how the design supply chain interacts.

So how exactly do we get computers to perform work for use? Knowledge engineering, the science of making computer perform magic.

4.2. Strengths of computers

Computers have four fundamental strengths:

1. **Storage**: Computers can store tremendous amounts of information reliably and efficiently.
2. **Retrieval**: Computers can retrieve tremendous amounts of information reliably and efficiently.
3. **Processing**: Computers can process stored information reliably and efficiently, mechanically repeating the same process over and over.
4. **Ubiquitous information distribution**: Computers can make information instantly accessible to individuals and more importantly other machine-based processes[32] anywhere on the planet in real time via the internet, simultaneously to all individuals.

So how do you harness this power provided by computers?

4.3. Major obstacles to harnessing the power of computers

However, there are a number of major obstacles to harnessing the power of computers to perform work for business professionals within one department, in an organization or across an entire supply chain. These obstacles include:

1. **Business professional idiosyncrasies**: The first obstacle is that different business professionals use different terminologies to refer to exactly the same thing.
2. **Information technology idiosyncrasies**: The second obstacle is that information technology professionals use different technology options[33], techniques[34], and formats[35] to encode information and store exactly the same information.

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[32] Wired: *The Web is Dead: Long Live the Internet*, http://xbrl.squarespace.com/journal/2010/9/24/wired-the-web-is-dead-long-live-the-internet.html

[33] See *Understanding Database and Query Options (Part 2)*, http://xbrl.squarespace.com/journal/2014/4/27/understanding-databasequery-options-part-2.html

[34] See *Understanding Database and Query Options (Part 1)*, http://xbrl.squarespace.com/journal/2014/4/26/understanding-databasequery-options-part-1.html

3. **Inconsistent domain understanding of and technology's limitations in expressing interconnections**: A third obstacle is that information is not just a long list of facts, but rather these facts are logically interconnected and generally used within sets which can be dynamic and used one way by one business professional and some other way by another business professional or by the same business professional at some different point in time. These relations are many times more detailed and complex than the typical computer database can handle. Business professionals sometimes do not understand that certain relations exist.
4. **Computers are dumb beasts**: The forth obstacle is that computers don't understand themselves, the programs they run, or the information that they work with. Computers are dumb beasts. What computers do can sometimes seem magical. But in reality, computers are only as smart as the metadata they are given to work with, the programs that humans create, and the data that exists in databases that the computers work with.

Computers do not create the magic. Skilled craftsmen who wield their tools effectively are what create the magic. Computers simply follow instructions.

If two computers use the same information formats and other technology aspects but use different terminology or different information organization strategies, the two computers will find it difficult or even impossible to interoperate. If this is the case, the only way to cross the chasm between these two different computers is with human intervention. Often this involves re-keying information. Saying this another way, in order for two computers to interoperate it is essential that every aspect including terminology, world view, information formats, instructions and so forth necessary to translate from one computer to the second computer must be explicitly provided.

Getting computers to perform work is straightforward science: The only way a meaningful exchange of information can occur is the prior existence and agreement on technical syntax rules, business domain semantics rules, workflow/process rules, and the information with which the computer will be working.

Computers are only able to reason with information that they have explicitly been given[36]. Remember, computers are dumb. Computers are incapable of implying meaning. This means that if the information is vague, inconsistent, logically incoherent, contradictory, ambiguous or in any other way unclear; the computer programmed to reason or use such information will produce either nothing at all or results which are likewise vague, inconsistent, logically incoherent, contradictory, ambiguous, or in some other way unclear.

It really is that straightforward: Nonsense-in-nonsense-out.

Computers cannot check the factual accuracy of information against reality. If the person who put the information into the computer made a mistake or intentionally entered the wrong information (i.e. fraud); that is exactly what the computer has to work with.

Finally there is setting the right expectations. Business professionals need to understand what computers can and cannot do. Computers cannot perform magic[37].

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[35] See *Understanding Syntax*, http://xbrl.squarespace.com/journal/2014/3/30/understanding-syntax.html
[36] Closed world assumption, http://en.wikipedia.org/wiki/Closed-world_assumption
[37] *Limitations of First-order logic expressiveness*, http://dior.ics.muni.cz/~makub/owl/

Computers fundamentally follow the rules of mathematics which follow the rules of formal logic. It really is that straight forward. Computers cannot effectively work with information such as the following:

- fuzzy expressions[38] - "It **often** rains in autumn."
- non-monotonicity[39] - "Birds fly, penguin is a bird, but penguin does not fly."
- propositional attitudes[40] - "Eve **thinks** that 2 is not a prime number." (It is true that she thinks it, but what she thinks is not true.)
- modal logic[41]
    - possibility and necessity - "It is **possible** that it will rain today."
    - epistemic modalities - "Eve **knows** that 2 is a prime number."
    - temporal logic - "I am **always** hungry."
    - deontic logic - "You **must** do this."

Computers can be provided with instructions in the form of explicit information which helps them mimic or seem to be able decipher such information; but it was really the business professional or information technology professional that created the instructions that made that happen.

At this time in history it is not possible for computers to think like human beings. Could it be possible in principle for computers to reason at some point in the future? Maybe. Artificial intelligence researchers have been working on this task for years but have been here-to-fore unsuccessful. IBM's Watson[42] is not intelligent. It only seems intelligent because the information used by Watson is clear, consistent, logically coherent, and unambiguous.

Overstating what a machine such as a computer can do is not wise. It is also not wise to either misunderstand the capabilities of a computer or to misinterpret what it takes to make a computer successful in performing the work that computers are capable of performing. Computers can perform specific types of work extremely well. Computers are machines that are very adept at reliably performing repetitive mindless tasks accurately. Even very sophisticated repetitive tasks can be performed by computers.

4.4. Computers are tools

In the hands of a skilled craftsman the right tools can produce quality results. In the wrong hands, the same tool might produce poor results.

And so as was pointed out there are a number of problems that need to be worked through in order to get computers to successfully perform the tasks that they are well suited to perform: reliably store a tremendous amount of information and reliably and automatically retrieve and work with that information by anyone from anywhere in real time. The idiosyncrasies of business professionals need to be

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[38] Fuzzy logic, http://en.wikipedia.org/wiki/Fuzzy_logic

[39] Non-monotonicity, http://en.wikipedia.org/wiki/Non-monotonic_logic

[40] Propositional attitudes, http://en.wikipedia.org/wiki/Propositional_attitude

[41] Model logic, http://en.wikipedia.org/wiki/Modal_logic

[42] *IBM's Watson not as smart as you think*, http://www.computerworld.com/article/2507369/emerging-technology/ibm-s-watson-not-as-smart-as-you-think.html

worked through, the idiosyncrasies of programmers, the idiosyncrasies of database builders and other information technology professionals need to be overcome. Computer languages and programs with sufficient expressive power to handle the richness of business information from complex business structures and transactions, different legal and cultural structures and so forth need to be created and implemented by information technology professionals for business professionals. Substantial care needs to be taken to ensure that the things and relations between the things within a problem domain are clear, logically coherent, consistent, unambiguous, and otherwise well-defined, precise, and accurate to reflect the facts of reality as currently reflected and flexible enough to change as today's dynamic business environment changes.

Flexibility and inflexibility/rigidity need to be appropriately balanced. Equilibrium achieved. The answer to all of these challenges, the state-of-the-art solution to the real problems of getting many business systems to successfully interoperate with many other business systems in a distributed environment[43] such that a meaningful exchange of information can occur between business systems is "standards based ontology".

Such a system must be reliable, repeatable, predictable, safe, cost effective, easy to use, robust, scalable, secure as deemed required, auditable (track provenance) as deemed necessary.

4.5. Ontologies are tools

The term ontology has been used in philosophy for thousands of years going back to the father of formal logic, Aristotle[44] (400 B.C.). Ontology is defined as the study of the things and the relations between things that exist in reality. The goal of philosophical ontology is to provide deliberate, clear, coherent and rigorously worked out accounts of the basic structures found in reality.

In more current times, the term ontology has become prominent in the area of computer science and information science. In computer science the term ontology generally refers to the standardization of a terminology framework such that information repositories can be constructed. Ontologies used by philosophers like Aristotle were not machine-readable. Ontologies used by computers are machine-readable.

The problem that ontologies solve is not that of simply coming up with a set of terms such as a dictionary or creating basic relations between terms such as a thesaurus or even more complex relations between terms expressed by a taxonomy. Rather, an ontology defines terms, organizes the terms into categories or classes, and determines as many important universal relations as practical and necessary between the categories or classes within some business problem domain. Ontologies are the pinnacle of expressiveness.

To understand this, it is helpful to look at the differences between a dictionary, a classification, a taxonomy, and an ontology.

- A **dictionary** is much like a list, a dictionary had no hierarchy. A dictionary is simply a flat list of terms with no relations expressed between the terms.

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[43] *Understanding Distributed Extensibility*, http://xbrl.squarespace.com/journal/2015/1/7/understanding-distributed-extensibility.html

[44] Aristotle's epistemology, http://en.wikipedia.org/wiki/Aristotle#Aristotle.27s_epistemology

- A **classification system** is a grouping of something based on some criteria. A classification tends to not have a hierarchy.
- A **taxonomy** is a classification system which does have a hierarchy, but the hierarchy tends to be less formal and less sophisticated. Taxonomies hierarchies tend to be trees of information.
- An **ontology** is a set of well-defined concepts which describes a specific domain. Ontologies are generally defined using class and subclass relations. Classes and subclasses have defined properties and relations. The goal of an ontology is to provide a formal, reference-able set of classes and relations which are used in communications within some domain. So, an ontology is also expressed as a hierarchy, but the hierarchy is more explicit and much richer in meaning than a taxonomy. Ontology hierarchies tend to be more like graphs[45] or networks[46].

4.6. Limitations of classification systems

At the same time we say that ontologies are powerful tools, we also need to point out that every classification system ever devised by humans has deficiencies of some sort. David Wenberger's book *Everything Is Miscellaneous*[47] points out two important things:

- That every classification scheme ever devised inherently reflects the biases of those that constructed the classification system.
- The role metadata plays in allowing you to create your own custom classification system so you can have the view of something that you want.

As we move from "atoms" to "bits", people drag along the rules which apply to atoms and try to apply those rules to solve problems in the world of bits. This, of course, does not work. *Everything Is Miscellaneous* has countless examples contrasting the physical organization of atoms (such as books in a book store) and the organization of books digitally (like Amazon.com).

The second thing pointed out is the three orders of order and the power of the Third Order of Order. There are three orders of order:

- **First order of order**. Putting books on shelves is an example the first order of order.
- **Second order of order**. Creating a list of books on the shelves you have is an example of second order of order. This can be done on paper or it can be done in a database.
- **Third order of order**. Adding even more information to information is an example of third order of order. Using the book example, classifying books by genre, best sellers, featured books, bargin books, books which one of your friends has read; basically there are countless ways to organize something.

Third order removes the limitations which people seem to assume exist when it comes to organizing information. Weinberger says this about the third order of order:

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[45] Graph theory, http://en.wikipedia.org/wiki/Graph_theory

[46] Network theory, http://en.wikipedia.org/wiki/Network_theory

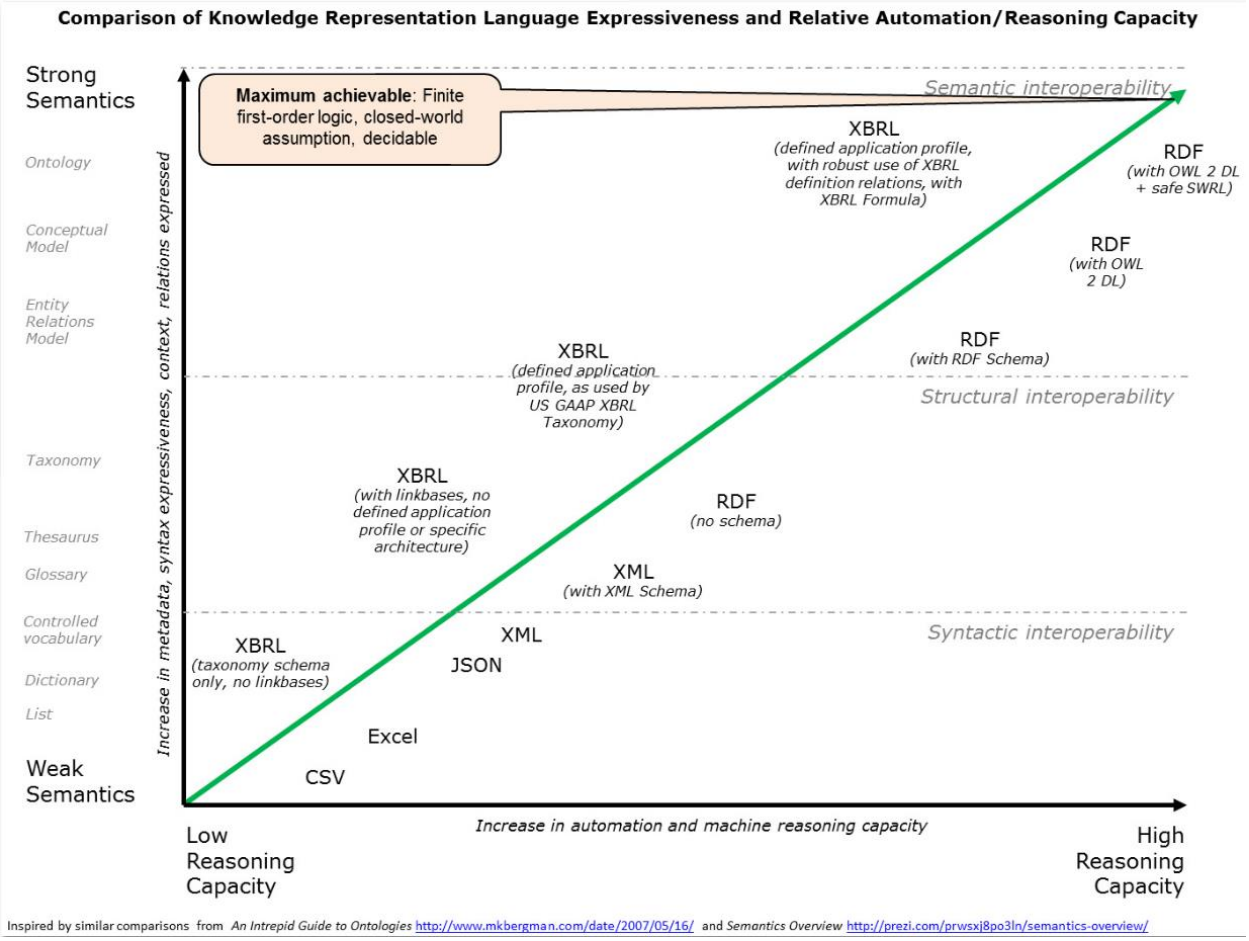
[47] *Everything is Miscellaneous*, http://goo.gl/dZD3lq

> *In fact, the third-order practices that make a company's existing assets more profitable, increase customer loyalty, and seriously reduce costs are the Trojan horse of the information age. As we all get used to them, third-order practices undermine some of our most deeply ingrained ways of thinking about the world and our knowledge of it.*

And so at the same time we say that ontologies are powerful tools and that every classification ever devised has deficiencies; we also point out that more metadata and relations are better than less. Again, creating an appropriate ontology is a balancing act, striking the appropriate equilibrium is the goal.

4.7. Relation between expressiveness and reasoning capacity

The diagram below compares the relative reasoning capacity which is achievable give the semantic power or expressiveness of some language. The goal is to maximize the reasoning capacity that can be achieve, or said another way the ability of a computer to automate work[48].



[48] This diagram is inspired by two other diagrams. First, from *An Intrepid Guide to Ontologies*, http://www.mkbergman.com/date/2007/05/16/; Second, from the presentation *Semantics Overview*, https://prezi.com/prwsxj8po3ln/semantics-overview/

We are not trying to represent data with ontologies; we are trying to represent information for the purpose of gaining knowledge[49]. Keep in mind that we are consciously using the term information and not data. Don't think "data" when we say "information". This summary helps you to understand the difference:

- **Data**: The basic compound for Intelligence is data -- measures and representations of the world around us, presented as external signals and picked up by various sensory instruments and organs. Simplified: raw facts and numbers.
- **Information**: Information is produced by assigning relevant meaning to data. Simplified: information is data in context.
- **Knowledge**: Knowledge is the subjective interpretation of information and approach to act upon the information in the mind of the perceiver. Simplified: knowledge is the interpretation of information.
- **Wisdom (or Intelligence)**: Intelligence or wisdom embodies awareness, insight, moral judgments, and principles to construct new knowledge and improve upon existing understanding. Simplified: wisdom is the creation of new knowledge.

Data that is not useable is simply noise. Data without context is not actionable[50]. Information is actionable.

4.8. Understanding what ontologies do

Ontologies overcome the four major obstacles of getting a computer system to perform work discussed previously. Remember the goal: reliable, repeatable, predictable, safe, cost effective, easy to use, robust, scalable, secure when necessary, auditable (track provenance) when necessary.

Ontologies both describe the information being worked with and verify information consistency against that description to avoid information quality problems or inconsistencies. When creating information it is important to verify that what has been created is consistent with the expected description. When consuming information it is important to understand that the information being consumed is consistent with the expected description. Remember: nonsense-in-nonsense-out.

The first two obstacles which related to the problem of business professional idiosyncrasy and technical idiosyncrasy are overcome by using an ontology to standardize terminology. Rather than using arbitrary[51] terminology to express information about some business domain, standard terminology is used. This includes selecting the appropriate important terms and defining the terms in a deliberate, rigorous, clear, logically coherent, consistent, and unambiguous manner. Care is taken to precisely and accurately reflect reality using standard terms.

The third obstacle of expressing the rich logical interconnectedness of facts within and across business systems can be overcome by using general ontological theories

[49] *Understanding Knowledge Modeling*, http://xbrl.squarespace.com/journal/2014/3/24/understanding-knowledge-modeling.html
[50] Understanding the Term Actionable Information, http://xbrl.squarespace.com/journal/2012/1/18/understanding-the-term-actionable-information.html
[51] Understanding the Difference between Standard and Arbitrary, http://xbrl.squarespace.com/journal/2014/8/22/understanding-the-difference-between-standard-and-arbitrary.html

disciplined, methodical, and rigorous approach to structuring the relations between terms. Meaning, expressed using machine-readable ontologies, must be exchangeable between business systems not just used within your one system.

Beginning with a rigorous and logically coherent specification of the theoretical information to be implemented makes it possible to address the problems of human idiosyncrasy.

Given the idiosyncratic tendencies of business professionals; interpretations which reflect the arbitrary peculiarities of individuals can sometimes slip in or mistakes can be made when expressing such terminology. Further, parts of our understanding of a business domain can be incorrect and even evolve, improve, or simply change over time.

If different groups of business professional use different terminology for the same concepts and ideas to express the exact same truths about a business domain; those business professionals should be able to inquire as to why these arbitrary terms are used, identify the specific reasoning for this, and specifically identify concepts and ideas which are exactly the same as other concepts and ideas but use different terminology or labels to describe what is in fact exactly the same thing. But to also understand the subtleties and nuances of concepts and ideas which are truly different from other concepts and ideas.

If idiosyncrasies result only in different terms and labels which are used to express the exact same concepts and ideas; then mappings can be created to point out these different terms used to express those same concepts and ideas. Such mappings make dialogue more intelligible and could get groups to accept a single standardized term or set of terminology for the purpose of interacting with common repositories of business information.

If the difference in terminology and expression are rooted in true and real theoretical differences between business professionals, and the different terms express and point out real and important subtleties and nuances between what seemed to be the same terms; then these differences can be made conscious, explicit, clear, and therefore they can discussed, in a rigorous and deliberate fashion because the differences are consciously recognized.

4.9. Knowledge engineering

Explaining exactly how to create an ontology is both beyond the scope of this document and not something that the average business professional needs to concern themselves with. There is a significant difference between the skills needed to create an ontology and use an ontology. Most business professionals will use ontologies rather than create ontologies from scratch. Business professionals will highly-likely append ontologies.

Further, there is a significant difference between creating ontologies for any business domain and creating ontologies for one specific business domain. Most business professionals will work within one business domain or perhaps interact with a handful of other business domains.

This is not to say that business professionals have no role or responsibility in creating ontologies. They do have a role. The first role is to understand knowledge

engineering[52] enough in order to grasp the moving pieces. The next role is to communicate with information technology professionals to create tools which abstract away as much of the complexity related to creating and using ontologies away so that business professionals can focus on their business domain. Business professional don't need to concern themselves with the details of exactly how everything works, but they need to have some grasp of the big picture and moving pieces.

While complexity can never be eliminated, complexity can be moved. Using the correct software development approaches, complexity can be buried deep within software that exposes simple to understand ideas to business professionals working with the technology in their business domain.

This is much like software developers creating software using higher-level languages and integrated software development environments rather than programming in assembly language using a text editor.

Some business professionals will become skilled knowledge engineers; specialists which help other business professionals create and work with high-quality ontologies to solve specific business domain problems or automate work.

4.10. The matter of technical syntax

Lastly is the matter of technical syntax. Ultimately, some technology needs to be used to implement a software-based solution. There are two global standard technical syntax options which are very useful in expressing information about a problem domain in the form of an ontology: XBRL[53] and OWL 2 DL[54]. Both global standard technical syntax options have pros and cons. Neither global standard technical syntax option has the full spectrum of expressiveness necessary to articulate what is necessary for most business problem domains.

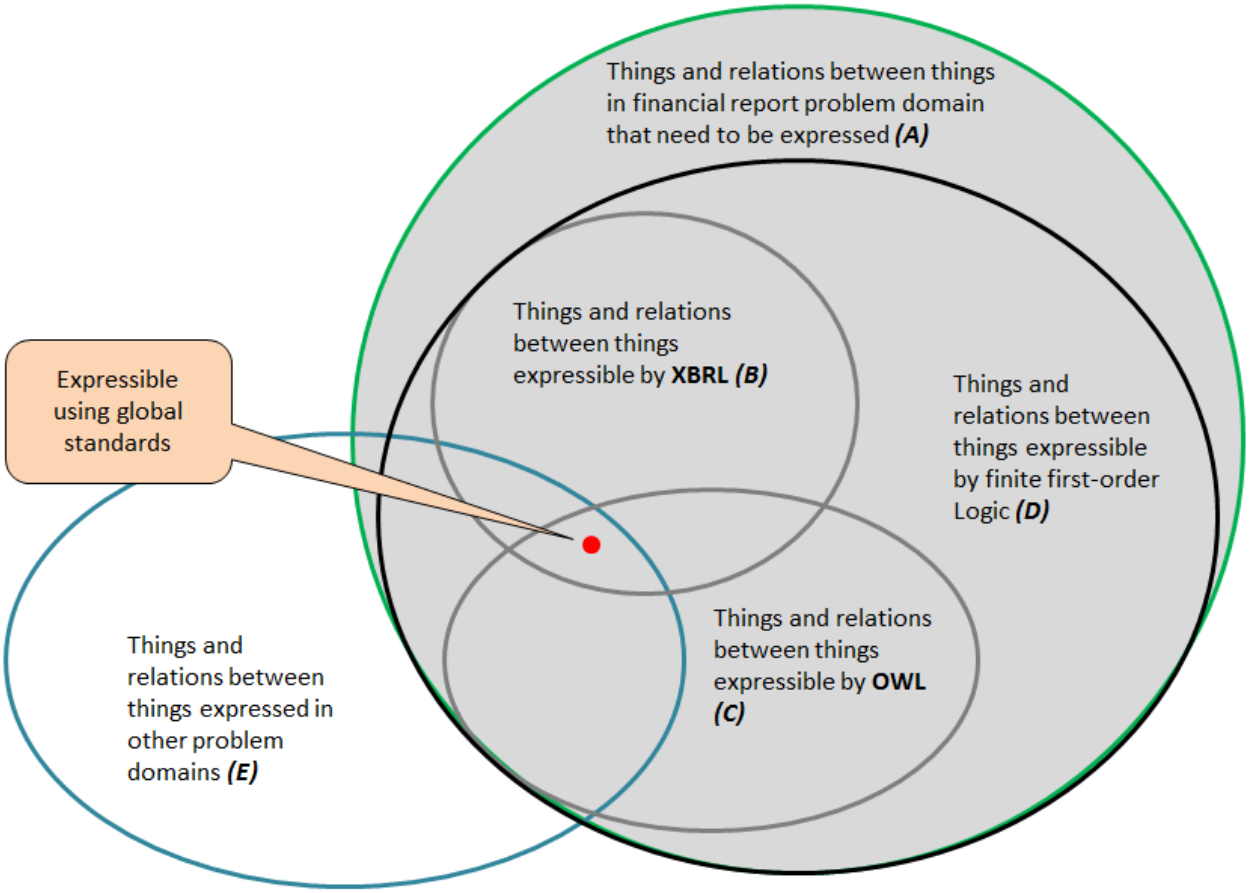
The graphic below makes this point using the domain of financial reporting which is a business domain with which I am very familiar. I have been trying to figure out how to create an ontology for a financial report[55] for over 15 years. I have used XBRL, OWL, and proprietary approaches. This is what I have discovered:

[52] *Knowledge Engineering 101 for Business Professionals*, http://www.xbrlsite.com/2015/Library/IssuesAndConsiderationsInCreatingDigitalFinancialReporting.pdf

[53] Extensible Business Reporting Language (XBRL), XBRL International, https://www.xbrl.org/

[54] Web Ontology Language (OWL), W3C, http://www.w3.org/standards/semanticweb/ontology

[55] Financial Report Ontology, http://xbrl.squarespace.com/financial-report-ontology/



This explains the graphic (note that the size of the circles have no meaning):

- **Theoretical goal**: The green circle with the label "(A)" represents the theoretical goal of expressiveness desirable for the business domain of a financial report. It represents every business rule for every relation anyone would ever want to express related to a financial report. This is a theoretical goal because it is highly unlikely that this objective will ever be met because of limitations of technology or the ability of the business domain of a financial report to ever discover and express this information.
- **Achievable using technology today**: The black circle with the label "(D)" indicates what is technically possible to implement today given the current state of technology. The best "bucket" that I can use to express the circle is the notion of finite first-order logic. There could be a better bucket and I cannot articulate the boundaries of the bucket, but it seems like the closest correct bucket because it meets two crucial needs and makes one crucial assumption. The assumption is the closed world assumption[56]. The two needs are the notion of "finite[57]" as contrast to infinite for which systems cannot be built and the notion of "decidability[58]" which eliminates other problems and system blowups.

[56] For details, see the document *Knowledge Engineering 101 for Business Professionals*
[57] For details, see the document *Knowledge Engineering 101 for Business Professionals*
[58] For details, see the document *Knowledge Engineering 101 for Business Professionals*

- **XBRL**: The lighter gray circle with the label "(B)" represents things that are expressible using XBRL currently using global standard approaches. The most important piece of XBRL is what XBRL can do but OWL cannot do. XBRL has two strengths: (1) the ability to articulate information about dimensional relations using the multidimensional model, (2) the ability to articulate mathematical relations. Clearly dimensional relations and mathematical relations are use cases for financial reporting in particular and business reporting generally. XBRL also has the power to express terms and relations between terms, but in this regard OWL is better equipped than XBRL. However, XBRL does have some expressive power here and it also has the architecture which enables richer expression of relations to be created.
- **OWL**: The other lighter gray circle labeled "(C)" represents things that are expressible using OWL 2 DL and Description Logic SROIQ[59]. OWL 2 DL and Description Logic SROIQ are state-of-the-art technologies which are W3C global standards for expressing ontologies. They meet the two needs of "finite" and "decidability" and also make the closed world assumption. These technologies surpass XBRL's current ability to express relations between terms. However, OWL 2 DL and Description Logic have two major limitations: (1) they do not have a dimensional model and (2) they don't support expressing mathematical relations. There is one additional drawback of OWL which is on the one hand a feature, but on the other hand something that is undesirable. OWL 2 DL is so low-level that it has the flexibility to represent any business domain, scientific domain, or any domain for that matter. But this flexibility comes with a price. The price is that OWL 2 DL is so low-level that it is like working in assembly language and therefore it is extremely difficult for even information technology professionals to make use of, and virtually impossible for business professionals to use.
- **Interoperability with other business domains**: The blue circle labeled "(E)" represents other domains which some business domain must interact and interoperate with. Using my example of a financial report which I am creating, other business domains creating ontologies interact with financial reports. For example, the Financial Industry Business Ontology (FIBO)[60] is likely one of those business domains. FIBO is expressed using OWL 2 DL. Public company financial reports filed with the SEC are XBRL-based. These different technical syntax are not a problem, as long as the business meaning, the semantics, are properly synchronized as pointed out earlier in this document. Other global standard technical syntaxes might be used by other business domains. Certainly proprietary formats will also be used internally by reporting entities.

At this point it is worth refreshing our memories of two things: the goal and how to achieve the goal. The goal is the reliable, repeatable, predictable, safe, cost effective, easy to use, robust, scalable, secure when necessary, auditable (track provenance) when necessary and *meaningful exchange of information between business systems*.

The only way a meaningful exchange of information can be achieved is with the *prior existence and agreement on technical syntax rules, business domain semantics*

[59] See Understanding Description Logic, http://xbrl.squarespace.com/journal/2015/1/8/understanding-the-importance-of-description-logic.html
[60] Financial Industry Business Ontology (FIBO), http://www.omg.org/hot-topics/finance.htm

rules, workflow/process rules, and the information with which the computer will be working.

Both XBRL and OWL 2 DL are global standard technical syntaxes. Both will likely progress to be able to serve the needs of business professionals, eventually. But what do we do today? What do we do now? One common denominator for both syntax is finite first-order logic. A partial solution is no solution, it leaves holes which cause problems. These are the complete solution alternatives that I see:

- **XBRL global standard + proprietary**: Using XBRL and supplementing XBRL with proprietary solutions which fill the gap will work. One problem with this is that the OWL-type functionality would need to be recreated in any proprietary solution.
- **OWL 2 DL global standard + proprietary**: Using OWL 2 DL could work, but then you would need to build the multidimensional functionality and the mathematical relations functionality. As I understand it safe SWRL[61] could be used to express mathematical relations. Others say SPIN[62] is a better choice than SWRL. Neither SWRL nor SPIN are W3C recommendations as of yet. The RDF Data Cube Vocabulary[63] could be used to express multidimensional relations. But then, since XBRL is used for actual financial reports, one needs to ultimately serialize information into and likely also read it from XBRL. If this approach is taken, things like open source OWL reasoners[64] can be leveraged.
- **Composite XBRL global standard + OWL 2 DL global standard + proprietary**: It has been suggested before that a composite solution could be built to move things between syntax to leverage both the power of XBRL and the power of OWL 2 DL. That means that any proprietary implementation which fills any gaps that exist would be minimized.
- **XBRL global standard + XBRL-based proprietary**: Another possible solution is to build proprietary, but read the handwriting on the wall and realize where XBRL has to go next and build an XBRL-based proprietary solution. For example, to provide the expressive semantics that OWL provides in XBRL. This can be done using XBRL definition relations[65]. I created arcroles to express all of the types of relations that I see are necessary for what I need to do to make sure a financial report is created correctly. What if someone implemented a semantic reasoner[66] tailored for XBRL-based digital financial reports or other digital business reports?

It is hard to say exactly what the best implementation approach might be all things considered. This is a decision for information technology professionals. But information technology professionals need to clearly understand the needs of business professionals in order to implement a complete solution.

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[61] Semantic Web Rules Language (SWRL), http://www.w3.org/Submission/SWRL/

[62] SPARQL Inferencing Notation (SPIN), http://www.w3.org/Submission/spin-overview/ and http://spinrdf.org/

[63] The RDF Data Cube Vocabulary, http://www.w3.org/TR/2014/REC-vocab-data-cube-20140116/

[64] JAVA-based open source OWL reasoner, http://code.google.com/p/owlreasoner/

[65] State-of-the-Art Use of XBRL Definition Relations to Express Business Rules, http://xbrl.squarespace.com/journal/2015/2/18/state-of-the-art-use-of-xbrl-definition-relations-to-express.html

[66] Semantic Reasoner, http://xbrl.squarespace.com/journal/2013/5/28/semantic-reasoner.html

4.11. Software usable by business professionals

As much as possible proprietary solutions should be avoided in favor of a solution which is based on global standard technical syntax. But that still does not provide business professionals with what they need. Business professionals will want to mainly do things like extend XBRL taxonomies (really they are ontologies). Some business professionals will create big base taxonomies such as the US GAAP XBRL Taxonomy or IFRS XBRL Taxonomy which exist for financial reporting. While those architectures need to be correct and it take more skilled professionals to design an architecture than to simply use an architecture; you will always have professional accountants needing to maintain those taxonomies (ontologies).

But most business professionals will be using taxonomies/ontologies created by other perhaps more highly skilled professionals in the area of knowledge engineering.

Software developers can leverage patterns to make software easier for business professionals to use. Patterns can be combined into composite patterns[67] make working with the technology less like working with low-level assembly language and more like working with Lego blocks.

There are three examples that help you understand what I mean by Lego blocks:

- **Blockly**[68]: This shows the abstract concept of how blocks can be used to work with syntax. Look at the visual, but also note that you can look at the same visual in the JAVA syntax, Python syntax, DART syntax, and XML syntax.
- **Scratch**[69]: This is a tool to help teach elementary school age children about programming. Imagine that the pieces of a financial report or other business report could be put together in this manner.
- **Quatrix**[70]: This is an application which while does not support XBRL, it works very similar to how I would expect an XBRL-based digital financial report creation tool to work.

There are three technically oriented tools that I have worked with to create OWL ontologies:

- **Protégé**[71]: (free download) This is a free software application which is very hard to use to create ontologies. Business professionals would never be able to use this type of tool.
- **Fluent Editor**[72]: (free download) This tool is a little easier to use because the user can simply create an ontology using a controlled natural language. However, you still need to understand how to create a correct ontology. Again, the typical business professional would never be able to effectively use this tool.

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[67] A Vision for Diagrammatic Ontology Engineering, see Patterns on page 5 and Merging patterns on page 7, http://ceur-ws.org/Vol-1299/paper1.pdf

[68] Blockly, https://blockly-demo.appspot.com/static/demos/code/index.html#5ge5sh

[69] Scratch, created by MIT, watch the video in the upper right hand corner of the web page, https://scratch.mit.edu/

[70] Quantrix videos, watch the Quantrix Key Concepts video, http://www.quantrix.com/en/community/videos/

[71] Protégé, http://protege.stanford.edu/

[72] Fluent Editor, http://xbrl.squarespace.com/journal/2015/1/29/fluent-editor-helps-accountants-see-where-financial-reportin.html

- **Top braid composer**[73]: (free download) This is probably the most complex tool that I have used to create ontologies, much too hard for business professionals to relate to.

Imagine the power of the technically oriented tools, an easy to user interface which hides complexity within well designed software which enables business professionals to only create things correctly. Business professionals would work with things that they understand from their business domain and deal with logic. If things act the way they expect, the logic of what they expect and the logic of what the software does are consistent; business professionals could very successfully make use of semantic technologies.

Too much to ask? I don't think so. Creating something that is complex is easy; anyone can do that. Creating something that is simple is hard work. Creating something simple takes thought, creativity, effort, etc. It takes a skilled craftsman. Such a tool will be elegant. Such tools can, and I believe will, be created.

XBRL International has created the Open Information Model working group[74] to develop a syntax-independent model of a business report. That shows that the understanding that syntax matters less and semantics matters more.

4.12. Understanding the critical importance of decidability

In order to understand critical aspects that make a system work we need to take a brief but important fork in this discussion to make the reader conscious of the notion of decidability. To understand the notion of decidability, we must also discuss the closed world assumption. We do that here.

There are two perspectives which can be adopted when evaluating information in a system: open world assumption and closed world assumption.

In the *open world assumption* a statement cannot be assumed true on the basis of a failure to prove the statement. On a World Wide Web scale this is a useful assumption; however a consequence of this is that an inability to reach a conclusion (i.e. not decidable).

In the *closed world assumption* the opposite stance is taken: a statement is true when its negation cannot be proven; a consequence of this is that it is always decidable. In other applications this is the most appropriate approach. So each application can choose to make the open world assumption or the closed world assumption based on its needs.

Because it is important that a conclusion as to the correct mechanics of a financial report is required because consistent and correct mechanics are necessary to making effective use of the information contained within a financial report; the system used to process a financial report must make the closed world assumption.

This assumption is not new to business professionals because business professionals make use of information from many, many relational databases and relational databases make the closed world assumption when working with data.

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[73] Top braid composer, standard edition, http://www.topquadrant.com/tools/modeling-topbraid-composer-standard-edition/

[74] See https://www.xbrl.org/news/open-information-model-call-for-participation/

Essentially what this means is that if the information is not within the set of information that you are directly working with, the information is assumed not to exist.

Decidability means that a conclusion can be reached. Specifically in our case, decidability means that a conclusion must always be reachable as to the correctness or incorrectness of the mechanical aspects of a financial report.

Decidable means that no interpretations that are not satisfied (unsatisfied or inconsistent) by at least one interpretation of the information in the system exists. If a representation of information is not decidable then the represented information is ambiguous because you cannot determine if the information is inconsistent or simply unsatisfied which means that a conclusion cannot be reached.

At the risk of being redundant we point out again the critical distinction between the mechanical aspects of a financial report and the subjective aspects which require or judgmental by a skilled accountant. A conclusion about the correctness or incorrectness of the mechanical aspects in no way suggests or implies that a computer will ever be able to determine the overall appropriateness of a financial report. Such determination always involves professional judgment and therefore always involves a skilled professional accountant.

4.13. Understanding the importance and limitations of first-order logic

First-order logic might seem hard to understand but in reality it is very a straight forward idea. First-order logic is simply an approach or language for describing things and relations between things. Again, different languages have different syntaxes, different levels of expressive power, they are good for some things and not as good as other things. Description logics[75] are a family of representational languages. *SROIQ* Description Logic[76] is one such language which is based on a fragment of first-order logic. There are two reasons *SROIQ* Description Logic is important: (a) it is decidable, (b) OWL 2 DL and *SROIQ* Description Logic have consciously equivalent expressive power. Meaning, they were consciously and specifically built to be equivalent for a reason and use the same fragment of first-order logic. While different syntaxes, semantically they are equivalent. While OWL and Description Logic were initially created independently, wise people realized that there are significant advantages to making them equivalent and with specific functionality[77]. The result was OWL 2 DL and *SROIQ* Description Logic which have different syntaxes but equivalent semantics.

Remember the discussion about decidability earlier? Both OWL 2 DL and *SROIQ* Description Logic where consciously created to be decidable. What is relevant here is not OWL 2 DL or *SROIQ* Description Logic. The two relevant pieces are that someone went through a lot of deliberate trouble to make these two tools equivalent and to use specific fragments of first-order logic which are decidable.

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[75] Description Logics, see http://en.wikipedia.org/wiki/Description_logic

[76] *A Description Logic Primer* describes the importance of *SROIQ*, http://arxiv.org/pdf/1201.4089.pdf

[77] *From SHIQ and RDF to OWL: The Making of a Web Ontology Language* helps you understand important ideas and concepts, see http://www.cs.man.ac.uk/~horrocks/Publications/download/2003/HoPH03a.pdf

A theory describes the world and tries to describe the principles by which the world operates. A theory is simply a system of ideas which is intended to explain something, for example the things and the relations between those things. A theory is generally explained using first-order logic.

A theory is a communications tool. A theory explains, using first-order logic, a theory explains real world things and relations between those things. A theory can be right or wrong, but it is characteristic by its intent: the discovery of essence. The purpose of a theory is to correctly describe the essence of some real world problem domain. Theories can be proven right or wrong. Theories can be tested.

For example, *Financial Report Semantics and Dynamics Theory*[78] is a theory that explains the mechanics of how a financial report works.

First-order logic is very powerful and can be used to express a theory which fully and categorically describes structures of a finite domain (problem domain). This is achieved by specifying the things of the problem domain and the relations between those things.

No first-order theory has the strength to describe an infinite domain. Essentially what this means is that the things and the relations between things which make up a problem domain must have distinct boundaries. They must be made finite.

This is not to say that such a system cannot be flexible. For example, a form is not flexible. A financial report is not a form. This is not to say, however, that a financial report cannot be finite.

4.14. Choice

There are many choices involved in the process of making digital financial reporting work. Digital financial reports need to be engineered. Computer science is just that; science.

The first choice is whether creating the machine-readable digital financial report is a desirable goal in the first place. Next, issues related to how a digital financial report might work need to be resolved.

Initial use of digital financial reports, mandated public company reporting to the SEC, has not gone perfectly and it can be hard to quantify the relative success or failure of that implementation of digital financial reports. But by all accounts, the following seems to be true:

- Software used to create XBRL-based digital financial reports is hard for public companies to use, there is no way private companies would tolerate that level of usability
- Data quality is not good enough to allow safe and reliable use of XBRL-based financial information which is reported.

This section is not about evangelizing XBRL-based digital financial reporting. Rather, this section explains general aspects of knowledge engineering that should be considered by accounting professionals in order to make digital financial reporting work effectively however one might define "work effectively". If creating and using a digital general purpose financial report is not simple, cost effective, and effective in

[78] *Financial Report Semantics and Dynamics Theory*, http://xbrl.squarespace.com/fin-report-sem-dyn-theory/

creating and exchanging financial information of a financial report, then digital financial reporting can never be adopted by the masses.

This section summarizes important general issues, outlines important considerations, and points out the opportunities which could be provided by digital financial reporting if it works as deemed appropriate by the financial reporting supply chain. The essence can be summarized in one concise reality:

> The only way a meaningful exchange of information can occur is the prior existence of agreed upon technical syntax rules, business domain semantics rules, and process/workflow rules.

4.15. Understanding the goal

As Stephen R. Covey pointed out in is seminal work *Seven Habits of Highly Effective People*[79], "Begin with the End in Mind." We begin with the end.

Prudence dictates that using financial information from a digital financial report not be a guessing game. It is only through conscious effort that the specific control mechanisms can be put in place to realize this intent.

The goal is a system that works safely, reliably, predictably, repeatedly, effectively, and efficiently.

Information technology professionals creating software must be able to create software which yields the same result when it would seem obvious to a business professional using software that the result, such as a query of basic information from a financial report, should be exactly the same even if different software applications are used.

Conscious and skillful execution using this approach can create digital financial reporting which is simple and elegant; and yet a sophisticated and powerful tool. Information in a digital financial reports must be deliberately created to be clear, consistent, logically coherent, and otherwise unambiguous to make sure the guessing game never takes place.

- *Complete solutions* are better than *incomplete solutions*
- *Less expensive solutions* are better than *more expensive solutions*
- *Powerful solutions* are better than *simplistic solutions*
- *Easy to maintain solutions* are better than *hard to maintain solutions*
- *Easy to use solutions* are better than *hard to use solutions*
- *Good solution performance* is better than *poor solution performance*
- *More scalable solutions* are better than *less scalable solutions*
- *Standard solutions* are better than *proprietary solutions*

[79] *Seven Habits of Highly Effective People, Habit 2*, http://www.amazon.com/The-Habits-Highly-Effective-People/dp/1455892823

4.16. Power of agreement

It is only through deliberate, methodical, rigorous and conscious collaboration, cooperation and coordination by the participants of the financial reporting supply chain that XBRL-based digital financial reporting will work safely, reliably, predictably, repeatedly, effectively, and efficiently. That is the goal. This goal will not be achieved by accident.

Consider the definitions of arbitrary and standard:

- **Arbitrary**: based on random choice or personal whim, rather than any reason or system; depending on individual discretion (as of a judge) and not fixed by law
- **Standard**: used or accepted as normal; something established by authority, custom, or general consent as a model or example

Is the purpose for each individual participant in the financial reporting supply chain to dig their heels into the ground and insist that their arbitrary reality is the only reality? Or is the purpose to consciously create a coordinated, shared, commonly accepted, standard, useful view of reality to achieve a specific purpose: so that reality does appear to be objective and stable enough yet nuanced enough to be useful so that information can be used safely, reliably, predictably, repeatedly by both human and automated machine-based processes. The desired system state is one of balance or equilibrium; of consistency.

Agreement is what creates the possibility of enabling machines to perform certain tasks. Business professionals are practical people. If business professionals wanted to have endless theoretical debates they would have become theologians, academics or philosophers. The goal is not to persist the debate; the goal is to agree in order to achieve a specific purpose.

4.17. Basic mechanics of a digital financial report

The basic mechanics of a digital financial report are consistent[80]. XBRL-based public company financial reports filed with the U.S. Securities and Exchange Commission are empirical evidence of this consistency. This consistency is caused by clarity as to these fundamental mechanics articulated by the technical specifications which describe how XBRL works. These mechanics are not open to interpretation.

And yet while 99.9%[81] of these relations are consistent, professional accountants, software vendors, and others do interpret these fundamental mechanics slightly differently.

At the highest level the financial information which is reported is likewise consistent. Overall consistency of a set of 22 basic relations such as "Assets = Liabilities and Equity" is about 98%[82]. Consistency of that specific relation, the accounting

[80] *Understanding the Basic Mechanics of a Digital Financial Report*, http://www.xbrlsite.com/2015/Library/UnderstandingTheMechanicsOfDigitalFinancialReport.pdf

[81] See *Arriving at Digital Financial Reporting All Stars: Summary Information*, page 4, http://www.xbrlsite.com/2014/Library/AnalysisSummary_ArrivingAtDigitalFinancialReportingAllStars.pdf

[82] See *Summary Information about Conformance with Fundamental Accounting Concept Relations*, http://www.xbrlsite.com/2014/Library/SummaryInformationAboutConformanceWithFundamentalAccountingConceptRelations.pdf

equation, is 99.75[83]%. By consistency we mean that every financial report universally follows a specific rule. This does not mean that every report follows exactly the same rules. For example, not every economic entity provides a classified balance sheet; some provide an unclassified balance sheet. But every entity provides either a classified or unclassified balance sheet. Classified and unclassified balance sheets have different rules. Liquidity basis statements of financial position are simply another class of statement.

And so it is the mechanical aspects of a financial report provides the frame of the report and are completely objective and not requiring judgment. What requires judgment is deciding *what* should go into the financial report; what gets disclosed.

4.18. Differentiating objective mechanical aspects from subjective aspects which require professional judgment

Digital financial reports contain thousands and sometimes many thousands of individual pieces or structures[84]. These structures, commonly formatted in machine-readable form using XBRL, are used to represent the information contained in the digital financial report. There are two distinct aspects of these pieces or structures that are important to recognize and be conscious of:

- **objective aspects** which are mechanical and do not require judgment and therefore can be managed using automated machine-based processes.
- **subjective aspects** which require the professional judgment of a skilled accountant, therefore they must be managed by humans.

These objective mechanical aspects are distinct from the subjective aspects which require professional judgment. The mechanical aspects relate to the things and relations between the things in a digital financial report. These mechanical aspects are governed by logic, common sense, and the rules of math. These mechanical aspects are what make up the structure or substrate of a financial report. Everything else fits into this frame or skeleton. This is much like the keystones of a building.

4.19. Representing the financial report problem domain in machine-readable form

A **problem domain**, such as the domain of financial reports, can be broken down into distinct, identifiable elements. This can happen on two different levels: first, on the level of individuals, when we break down this specific financial report into these specific elements unique to that specific financial report. And second, on the level of classes, when we distinguish classes of elements common to all financial reports and therefore universal to all financial reports. Another term for problem domain is area of concern.

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[83] See *Arriving at 2014 Digital Financial Reporting All Stars: Summary*, http://www.xbrlsite.com/2015/Library/AnalysisSummary2014_ArrivingAtDigitalFinancialReportingAllStars.pdf

[84] *Understanding that XBRL-based Digital Financial Reports are made up of Distinct Identifiable Pieces*, http://xbrl.squarespace.com/journal/2015/5/3/understanding-that-xbrl-based-digital-financial-reports-are.html

Historically, information technology professionals and knowledge engineers have used different terminologies and schemes for describing these identifiable elements of a problem domain (concept maps, UML, UML+ OCL, entity relationship diagrams, semantic data model[85], conceptual model[86], and now what is commonly referred to as the "Semantic Web"). Different schemes often use different terms to refer to exactly the same thing or they use the same term to refer to different things. Different approaches have different expressive power[87] which may, or may not, meet the needs of a business domain. This adds to the confusion of how to best represent real world problem domains in machine-readable form and get the results a business professional expects and desires.

Therefore, we created one common set of terms based on global standard and current state-of-the-art technology. That standard is OWL 2 DL[88] and SROIQ Description Logic which have different technical syntaxes but equivalent semantics.

XBRL should remain consistent with this W3C global standard.

4.20. Machine-readable representations, Taxonomy/Ontology 101

As mentioned, different terms are used to describe a machine-readable representation including taxonomy, ontology, and vocabulary[89]. Although it might seem scary, we will standardize on the term ontology and state that an XBRL taxonomy is, and ought to be, an ontology.

An ontology is a salient collection of the classes and subclasses of a problem domain or area of concern. An ontology accurately represents reality. The goal of an ontology is to provide a deliberate, rigorously and methodically worked out, description of the important things and relations between things which is clear, consistent, logically coherent, and unambiguous.

Ontologies identify and describe sets of basic categories of things and universal similarities that these sets have. Universals can be instantiated by more than one object at more than one time. Particulars are non-repeatable and can exist in only one place at any one given time. So, things can be universals or things can be particulars. Relations can exist between universals and particulars:

- **Universal to universal relations**, "is-a" or "is a subtype of" type relations
- **Universal to particular relations**, "has-property" type relations
- **Particular to particular relations**, "part-of" type relations

An ontology should fit the needs of the some specific community, such as a supply chain. Ontologies describe or explain how the collection of things within the problem domain can be represented.

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[85] Semantic data model, http://en.wikipedia.org/wiki/Semantic_data_model

[86] Conceptual model, http://en.wikipedia.org/wiki/Conceptual_model

[87] OWL and OCL for Semantic Integration, http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.2.7683&rep=rep1&type=pdf

[88] See OWL 2 Web Ontology Language Primer (Second Edition), http://www.w3.org/TR/owl2-primer/#OWL_2_DL_and_OWL_2_Full and the OWL 2 Overview, Semantics section, http://www.w3.org/TR/owl2-overview/#Semantics

[89] Interestingly, the W3C page http://www.w3.org/standards/semanticweb/ontology (notice ontology at the end of the URL) uses the term "Vocabularies".

Ontologies have no concern with computational efficiency of a software application.

An ontology should be tractable rather than intractable.

We have distilled the key terminology down to its essence, focusing on terms important to business professionals, information technology professionals, and knowledge engineering professionals who need to communicate in order to articulate information about a problem domain in machine-readable terms. We use the Semantic Web language OWL to capture what we see as the most important elements in the domain of financial reports. OWL is a state-of-the art global standard approach to describing a problem domain.

The following are the key high-level definitions of terms:

- **Thing**: A thing is something that exists in the real world, in the problem domain, in the area of concern. A thing is just a class that all classes and individuals of the problem domain must belong to. All classes are subclasses of thing. Every individual must be of some class. Every class is a thing. Therefore since all classes are subclasses of thing; then all individuals are likewise ultimately a thing. "Nothing" is the opposite of thing.
- **Class**: A class is a set of individuals that have one or more similar distinguishing features in common. Classes are universals. For example *person* is the class consisting of all persons of which *Bill Gates III* is a member. Each problem domain can be captured in terms of a family of classes, together with a set of relations. The most important relation is the subclass relation (also called *is-a*) which organizes the classes in a taxonomic tree. Other key types of relations are *whole-part* and *has-part*.
- **Individual**: An individual is some specific item that exists in reality. Individuals are particulars. For example, a specific person such as *Bill Gates III*, a specific report such as *Fiscal year 2014 financial statement*, a specific economic entity such as *Microsoft Corp*. An individual exists only once.
- **Property**: (universal to particular, has property) A property is a trait, quality, feature, attribute of an individual, for example the property of *being male* of a person, of *being filed* of a report, and so on.
- **Relations between individuals**: (particular to particular, part of) one individual can be related to another individual, as when *Bill* is *brother-of Dave*, *Bill* is *owner-of the building at 1835 73rd Ave NE, Medina*, and so on.
- **Relations between classes**: (universal to universal, is subtype of) when every member of a certain class stands in a certain relation to some member of another class, then the relation is universal and we can formulate this as a relation between classes. So for example because every brother *is identical to* some male person, we can assert this as a *relation* between the classes *brother* and *male person* to the effect that *brother is-a male person* – in other words the class *brother* is included as a subclass in the class *male person*. If every *financial report* has some *statement* as part, then we can assert *financial report has-part statement*. Relations between classes are universal and apply to every member of that class.

The result of the above rules is a system which always has a single root class at the very top called 'Thing' and a single leaf class at the bottom called 'Nothing'. Thing is the universal class to which all other classes are subclasses must ultimately belong in the financial report domain. All individuals are ultimately members of the universal class. Nothing is an empty class which has no members at all. And so, every such system has Thing at the top, Nothing at the bottom, and business problem domain classes in the middle.

This is a crucial distinction because that resulting organization allows for a conclusion to be reached as to the consistency of some human-readable or machine-readable representation of the problem domain with the description of the problem domain provided by the system. Basically, this system organization is finite rather than infinite.

Having a finite system organization is crucial because if a conclusion cannot be reached as to the consistency of some representation with the description then the system is infinite. Infinite systems are unsafe. Unsafe means that unexpected results, ambiguous results, complexity results which can lead to a machine entering an infinite loop from which it cannot escape could possibly occur.

The fact that the system can be completely described, to the extent of the expressive power of the language of the statements/axioms, by a given set of statements/axioms is provable using formal logic. As such, the finite system a useful tool: it is safe, predictable, reliable, results are repeatable, and no unexpected complexity-caused blowups will occur.

4.21. Representing reality

The ontology uses lower-level terms which fit into the higher-level terms we just described.

The central function of an ontology is to represent reality of the problem domain comprehensively, precisely, and accurately. The quality of an ontology is a function of the comprehensiveness and accuracy of the representation of things and relations between things which make up the problem domain. An ontology is a machine-readable "window" into reality.

There are two approaches to viewing "reality".

One approach is to believe that reality (the world) exists objectively in-and-of itself; reality is independent of any one person. Therefore, reality is knowable; the world exists and its properties are there to be discovered. This view implies that reality is objective and knowable and therefore constraints can exist as to what can be said about reality. In other words, ontologies which provide representations of the world could get things wrong. Therefore, an ontology is right insofar as it accurately reflects the way the world is.

A second approach is to believe that there is no one reality, that every individual perceives the world and that individual perception is reality. This view implies that reality is subjective. This view does not imply that reality is not knowable because there are so many realities that it is impossible to agree on one reality. Rather, it implies that there are "reality camps" or groups of individuals with common beliefs about reality. Therefore, an ontology can represent one "reality camp". Which implies that an ontology can be created for each camp. Therefore, the second approach becomes equivalent to the first approach.

The following terms help one understand the difference between an important nuance and an unimportant negligible difference.

- **Nuance**: a subtle difference in or shade of meaning, expression, or sound; a subtle distinction or variation
- **Subtle**: so delicate or precise as to be difficult to analyze or describe; hard to notice or see; not obvious
- **Negligible**: so small or unimportant as to be not worth considering; insignificant; so small or unimportant or of so little consequence as to warrant little or no attention

Business professionals can best differentiate important nuances from unimportant negligible differences. They do not do it perfectly and the only real way to make sure things are right is testing and experimentation at times.

Ontologies are about getting the salient aspects of a problem domain right. One needs to take a pragmatic view of the world because it is impossible to describe every single aspect of the world. Ontologies only need to represent the important things. An ontology is therefore more like a "wireframe" or a "substrate".

Central to the idea of representing the things in reality is the notion of fidelity. Fidelity means to be a faithful representation or expression of reality relevant to the domain experts who explain the problem domain. Fidelity is the correspondence between or quality of the ontology's representation of the problem domain and the real world.

One final set of terms is important to make clear:

- **Policy**: a course or principle of action adopted or proposed by a government, party, business, or individual; definite course or method of action selected from among alternatives or options and in light of given conditions to guide and determine present and future decisions or choices
- **Requirement**: a thing that is needed or wanted; something that is needed or that must be done
- **Choice**: an act of selecting or making a decision when faced with two or more possibilities or options; the act of choosing; the act of picking or deciding between two or more possibilities or options
- **Option**: a thing that is or may be chosen; the opportunity or ability to choose something or to choose between two or more things

The reason these terms are important is because if options exist and therefore a choice exists, but then a policy is established that no longer allows certain options; then an option can be turned into a requirement.

4.22. Difference between "simple" and "simplistic"

Anyone can create something that is sophisticated and complex. It is much harder to create something that is sophisticated and simple. Simple is not the same thing as simplistic. "Simple" is not about doing simple things. Simple is the ultimate sophistication. Simple is elegant.

Simplicity is "dumbing down" a problem to make the problem easier to solve. That is not what simple is about. Simple is about beating down complexity in order to make

something simple and elegant; to make sophisticated things simple to use rather than complex to use.

4.23. Challenges of representing a problem domain

The creation of an ontology is an engineering process, the specialty of knowledge engineers.

An ontology is created about some problem domain, the specialty of domain experts. Financial reporting is a problem domain and professional accountants are experts in that problem domain.

The creation of the machines, the software applications, which leverage the machine-readable ontology is likewise an engineering process, the specialty of software engineers.

It is important to define the term engineering. Engineering is the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of something." Building a bridge and engineering a bridge are different things.

Software engineering and knowledge engineering lives in their own little worlds, silos[90]. Professional accountants live in a completely different world.

And so to summarize this situation succinctly: software engineers generally don't understand knowledge engineering; knowledge engineers generally don't understand software engineering; neither software engineers nor knowledge engineers generally understand financial reporting; and professional accountants generally have no idea what knowledge engineering is and are only a little more adept at communicating with software engineers.

Yet, properly enabled functionality, when properly implemented in software, could provide professional accountants with an ability to automate certain specific mundane tasks.

Add to that differences in the interests of participants in the financial reporting supply chain. Professional accountants don't all have the same fundamental interests. Some professional accountants create financial reports. Other professional accountants, financial analysts, analyze the information reported within the financial reports. Other professional accountants work for the FASB and have to create the financial reporting standards necessary for economic entities to report and satisfy the information needs of financial analysts and other users of such information.

Each of these subgroups of professional accountants has a different take on reality because they have different fundamental interests.

Ontologies must be engineered (systematic, disciplined, qualified, etc.) by professionals who communicate effectively. All too often, a software engineer listens to a business professional, takes notes, and then implements what was written down in the notes. That is not engineering. Often, one needs to have the professional skills to "read between the lines" of what a business professional is saying in order to distill the true meaning from what was said.

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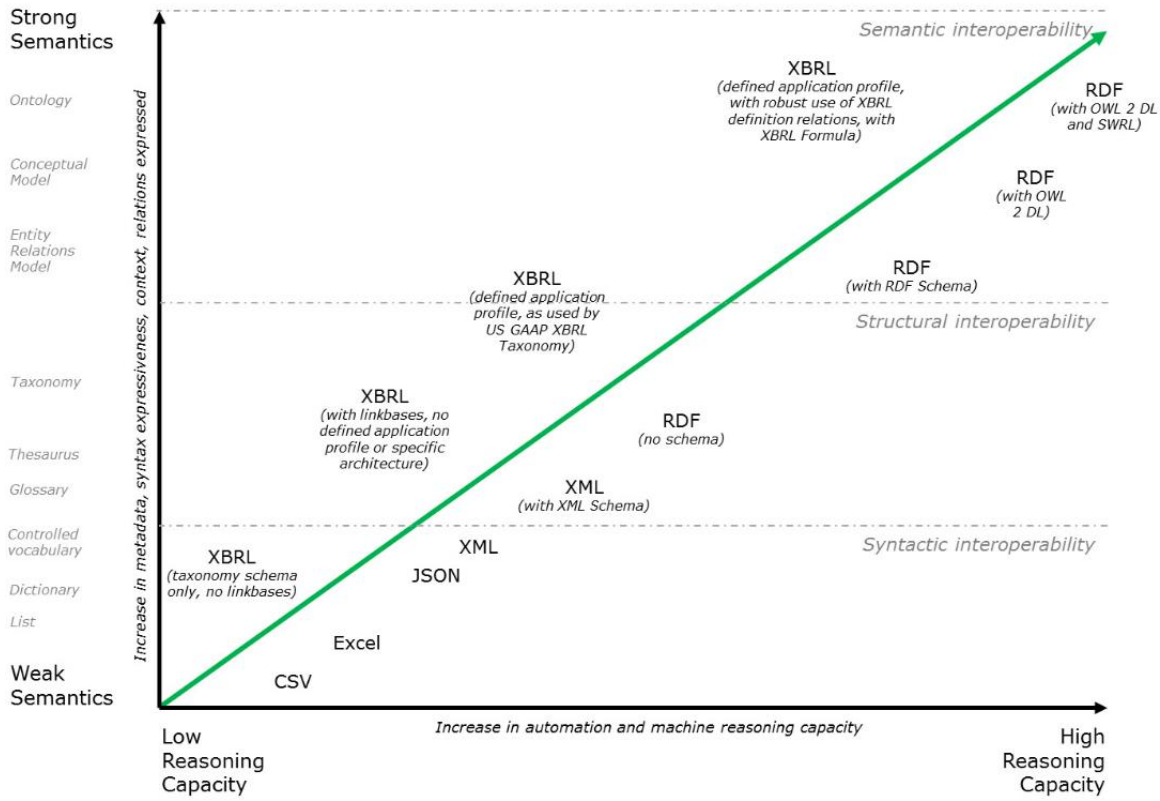
[90] *Applications of Ontologies in Software Engineering*, https://km.aifb.kit.edu/ws/swese2006/final/happel_full.pdf

4.24. Overcoming Limitations of Knowledge Representation Languages

No knowledge representation language is 100% complete. Each has limitations. One must be conscious of such limitations when creating a representation of some problem domain in machine readable form. The graphic below compares knowledge representation language expressive power with the achievable relative level of automation and/or reasoning capacity which can be achieved with that knowledge representation language.

Comparison of Knowledge Representation Language Expressiveness and Relative Automation/Reasoning Capacity



spired by similar comparisons from *An Intrepid Guide to Ontologies* http://www.mkbergman.com/date/2007/05/16/ and *Semantics Overview* http://prezi.com/prwsxj8po3ln/semantics-overview/

Neither XBRL nor OWL 2 DL + SAFE SWRL has 100% of what is necessary to represent 100% of what is necessary for digital financial reporting. Which is the best alternative is unknown at this point in time. The specific gap between the two in terms of expressive power is unknown at this time.

4.25. Pitfalls of knowledge engineering

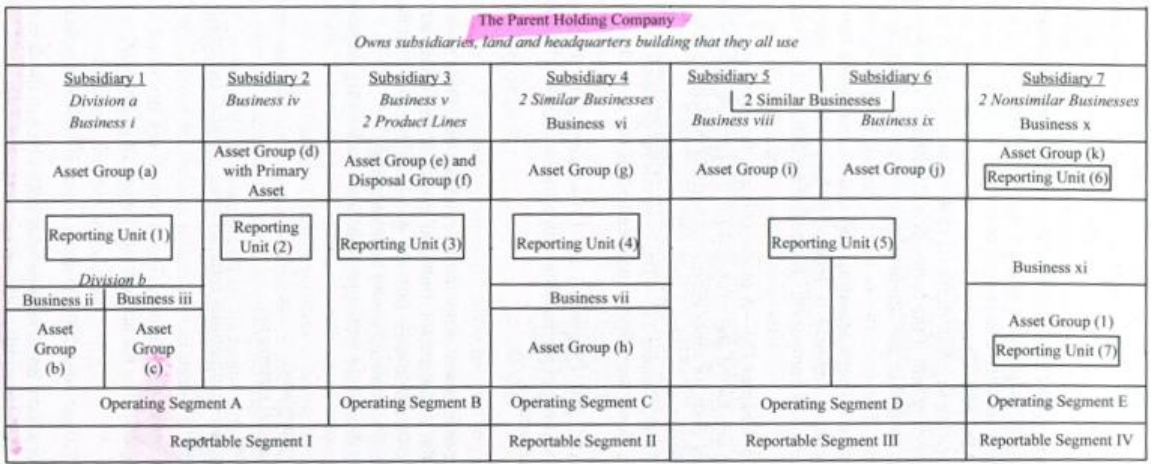
There are many different ways to stumble when trying to represent the knowledge of a problem domain. The following is a summary of many common pitfalls which should be recognized and then avoided.

4.25.1. One rigid reality

Many of the things in a business problem domain are the invention of humans: the foot or meter, currency such as the US Dollar or the Euro, laws, regulations, accounting rules, concept of a legal entity. As such, to a large extent these things that are the creation of humans are malleable. At times there cannot be one single "correct" ontology for things in a problem domain because of inconsistencies in these human inventions. And so it can be the case that there is no single objectively correct answer, but possibly some set of pragmatically-based set of correct answers of some set of groups of users with clearly defined goals but with different sets of interests or self-interest of the specific set or group.

Fundamentally, excessive commitment to reality can lead to and inappropriate level of flexibility or inflexibility.

To make this point clear we use the following example pointed out in the Wiley GAAP 2011, *Interpretations and Applications of Generally Accepted Accounting Principles*, Bragg, page 46:



The segments into which a reporting entity can be broken down are defined inconsistently in the financial reporting literature. From FASB Accounting Standards Codifications, ASC 280 relates to the classification of assets and sometimes liabilities uses the terms operating segments and reportable segments of the business. ASC 350 which relates to impairment uses the term reporting unit. ASC 860 which relates to special-purpose entities and the master glossary uses the term business. ASC 360 which relates to long-lived assets uses the term asset groups and disposal groups. Are all of these different sets of terminology necessary? Perhaps yes, perhaps no.

The following standard terminology is proposed by the Wiley GAAP Guide:

- Consolidated entity
- Parent holding company
- Operating segment (ASC 280)
- Reportable segment (ASC 280)
- Reporting unit (ASC 350)
- Business (ASC 805)
- Asset group (ASC 360)
- Disposal group (ASC 360)

There are two approaches to dealing with this issue: (a) get the FASB to fix the problem or (b) do something to address the symptoms of the problem because the FASB won't or can't address this issue.

Again, note that this is one specific example provided to show that reality is sometimes malleable. At other times reality is less malleable. This specific example is representative of a more general situation.

4.25.2. Overly complicated representation

On the one hand, one must be careful of the illusion of clarity and apparent rigor where, in fact, there is little or no rigor or clarity. These illusions mask problems definitions of things which can be exceedingly difficult and even problematic to correctly characterize or how things interact with one another. Some problem domain things can be untenable regardless if one attempts to articulate the things in machine-readable form. Not recognizing such issues provides a false sense of meaningful information exchange.

Overly complicated representations are spots where the illusion of clarity can hide. Making things obscure by adding unnecessary and perhaps inaccurate details. This also adds to complexity which is simply not necessary.

4.25.3. Blind trust of domain experts

Knowledge engineering calls for careful attention being paid to domain experts characterization of a domain by skilled knowledge engineers. But giving blind trust to domain experts is not appropriate. Knowledge engineers must have a critical side, analyzing and challenging representations for consistency and adequacy. Domain experts are not always right. Blind trust can lead to inappropriate tolerances and otherwise poorly constructed knowledge representations and ultimately an unworkable machine-readable representation.

One of the best ways to overcome this pitfall is to use deliberate and rigorous testing in order to check understanding.

4.25.4. Misuse of highly-expressive languages

Using a highly-expressive language is no guarantee against sloppiness or process deficiencies. Highly-expressive languages offer the power and ability to articulate rich and precise rules for important classes and relations between classes. A weakly-expressive language encourages sloppiness and commonly leads to inaccuracies due to the deficiencies in ability of the weakly-expressive languages to articulate important classes and relations between classes. Where only weak-expressivity is available rich expressiveness is not even available to the knowledge engineer; the result can be a superficial representation which is not useable by the problem domain.

4.26. Recognize that pitfalls are avoidable

Pitfalls are avoidable. Limitations are many times unavoidable and must be worked around. While the real world is malleable and there are always options for representing classes and relations between classes in various ways; this does not mean that everything can be created in any way one pleases. Using one approach in one specific area can mean that options are constrained for some other area of the

representation. Dysfunctional, irrational, nonsensical, illogical, inconsistencies, and other issues which cause problems must be discovered and dealt with.

There is a difference between conscious inconsistencies and unconscious inconsistencies. Conscious inconsistencies are generally choices which are made because things are truly different, perhaps only subtle differences or nuances. Unconscious inconsistencies are generally due to sloppiness and lack of attention to detail and cannot be explained which pointed out and questioned.

4.27. Rigorous testing maximizes communication and quality

The best way of assuring that a machine-readable representation is not dysfunctional, irrational, nonsensical, illogical, inconsistent or has some other issue is comprehensive, thorough, deliberate, rigorous testing. Another is examining empirical evidence. Testing is s robust and pragmatic approach to checking understanding and determining if communication has taken place between domain experts, knowledge engineers, and software engineers who ultimately must implement software.

4.28. Representational framework.

A framework which cannot be measured for simplicity is a recipe for unnecessary complexity. Conscientious knowledge engineers are compelled to express a problem domain's classes and relations as richly as possible. With a highly-expressive language at a knowledge engineer's disposal it is possible to think through different representational options at a level of detail that is impossible with a weaker-expressive language. Stronger frameworks push one more than one using a weaker framework. Testing pushes one more than not using testing toward greater accuracy and comprehensiveness. As is said, "Ignorance is bliss." Limitations of expressivity of the representation language used should be exposed so that the limitations become conscious.

4.29. Global standard knowledge engineering framework

Empowered by this goal and with the intension of achieving this goal; the intelligent and wise direction of those who brought OWL 2 DL and SROIQ Description Logic (fragment of first-order logic which is decidable) together should be emulated.

At a minimum, there will be software vendors and others who desire to convert from OWL 2 DL + SAFE SWRL to XBRL, and from XBRL to OWL 2 DL + SAFE SWRL. No matter what the representation language, the meaning expressed should be equivalent as the "reality" being represented by the domain is the same. It is only the representation language which changes. While different representation languages have different limitations in terms of what can be expressed, what can be expressed should mean the same in each representation language.

Today, neither XBRL nor OWL 2 DL + safe SWRL or safe SPIN can represent 100% of what the domain of financial reporting needs to express. Finite first-order logic can represent this information[91]. Eventually XBRL and/or OWL 2 DL will catch up to the needs of financial reporting. Until then, proprietary approaches likely need to be used. XBRL-based proprietary approaches are the best, all things considered.

[91] Terminology of a Financial Report, http://www.xbrlsite.com/2015/Library/TerminologyOfFinancialReport.pdf

4.30. Relations between things are business rules which should be managed by business professionals

As we pointed out earlier, an ontology provides a machine-readable representation of the important things and relations between the things of some problem domain. People refer to these relations in many different ways.

Some people use the terms "TBox[92]" and "ABox[93]". TBox statements describe the things, the terminology component or the controlled vocabulary of a problem domain. ABox statements describe the relations between the things, the assertions component of the problem domain.

Another term used to describe relations is business rule. The Business Rules Manifesto[94] does a good job of describing what a business rule is. Article 9; Of, By, and For Business People, Not IT People; points out the need for these business rules to be managed by business professionals:

- 9.1. Rules should arise from knowledgeable business people.
- 9.2. Business people should have tools available to help them formulate, validate, and manage rules.
- 9.3. Business people should have tools available to help them verify business rules against each other for consistency.

Business professionals are the ones who understand the problem domain. As such, business professionals are the ones who understand the business rules or relations between the things in their problem domain.

4.31. One global standard digital financial report or multiple global standards?

Unless someone consciously and explicitly creates one global standard digital financial report specification then there is a risk that multiple digital financial report specifications will exist. While consciously and explicitly creating one global standard digital financial report specification is no guarantee that only one such specification will exist; if no one specification is created it is at least highly likely that multiple specifications will come into existence and those digital financial report specifications may or may not be interoperable. Further, if one global standard specification is not created it opens up the possibility of multiple proprietary standards which are even less likely to be interoperable.

While it is not the end of the world if there are two or perhaps even a few more global standards for digital financial reporting it is the business professional who will ultimately pay the price for unnecessary standards. And this is not to say that if two global standards exist for conscious reasons and with explicit differences in functionality which someone can point to and explain. There is nothing wrong with two global standards if business professionals require two global standards.

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[92] T Box, http://en.wikipedia.org/wiki/Tbox

[93] A Box, http://en.wikipedia.org/wiki/Abox

[94] *Business Rules Manifesto*, http://www.businessrulesgroup.org/brmanifesto.htm

What would be a travesty is if there were 10 global standards when 1 global standard would have done and business professionals pay for the inattention which caused that problem to occur with higher priced software.

Imagine a bank trying to implement digital financial reporting in order to reduce the costs of collecting and managing financial information in support of a commercial loan. Say that digital financial reporting was adopted and that for one reason or another 10 different standards for creating a digital financial report existed. Say the bank had 10,000 customers who had loans and who now must submit digital financial reports to the bank. Say the 10 different standards where used equally, 1,000 customers used each of the 10 different formats. How would that work out for the bank which needed to deal with 10 different formats?

4.32. Understanding the taxonomy/ontology life cycle

Just like many other things a taxonomy or ontology has a life cycle. The paper *Towards ontology evaluation across the life cycle*[95] explains the problem of not understanding that life cycle and not being able to evaluate the quality of an ontology:

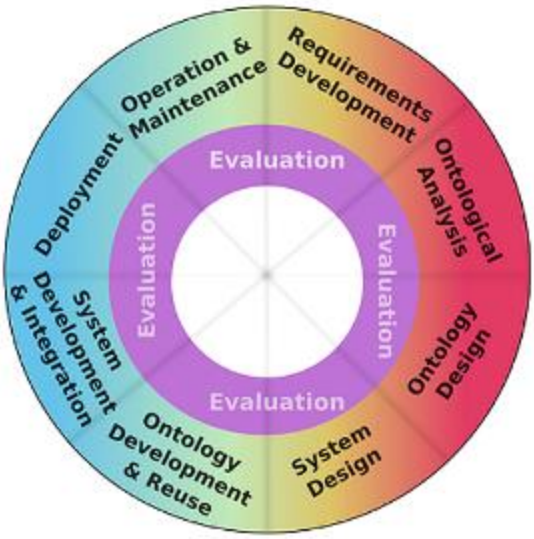
> Problem: Currently, there is no agreed on methodology for development of ontologies, and there is no consensus on how ontologies should be evaluated. Consequently, evaluation techniques and tools are not widely utilized in the development of ontologies. This can lead to ontologies of poor quality and is an obstacle to the successful deployment of ontologies as a technology.

The paper points out that there are five aspects to the quality of ontologies which need to be evaluated:

- intelligibility
- fidelity
- craftsmanship
- fitness
- deployability

The paper provides this diagram of the different stages of the taxonomy/ontology life cycle:

[95] Towards ontology evaluation across the life cycle, http://www.researchgate.net/publication/260834360_Toward_Ontology_Evaluation_across_the_lifecycle



This is a list of the stages which are explained in the document:

- System design
- Ontology design
- Ontological analysis
- Requirements definition
- Operations/maintenance
- Deployment
- System development and integration
- Ontology development and reuse

As we mentioned in a previous section, testing helps to maximize communication and therefore quality of an ontology or taxonomy. Evaluation and testing are the same thing.

4.33. Reading list

The following books are extremely helpful in trying to understand digital financial reporting. We strongly recommend that for anyone who wants to understand digital financial reporting well or who want to build rock-solid products/solutions to read the following books:

Data and Reality[96], by William Kent: (162 pages) While the first and last chapters of this book are the best, the entire book is very useful. The primary message of the Data and Reality book is in the last chapter, Chapter 9: Philosophy. The rest of the book is excellent for anyone creating a taxonomy/ontology and it is good to understand, but what you don't want to do is get discouraged by the detail and then miss the primary point of the book. The goal is not to have endless theoretical/philosophical debates about how things could be. The goal is to create

[96] See, http://xbrl.squarespace.com/journal/2014/7/28/data-and-reality-what-is-the-purpose-of-sec-xbrl-financial-f.html

something that works and is useful. A shared view of reality. That enable us to create a common enough shared reality to achieve some working purpose.

Everything is Miscellaneous[97], by David Wenberger: (277 pages) This entire book is useful. This is very easy to read book that has two primary messages: (1) Every classification system has problems. The best thing to do is create a flexible enough classification system to let people classify things how they might want to classify them, usually in ways unanticipated by the creators of the classification system. (2) The big thing is that this book explains the power of metadata. First order of order, second order of order, and third order of order.

Models. Behaving. Badly.[98], by Emanual Derman: (231 pages) The first 100 pages of this book is the most useful. If you read the *Financial Report Semantics and Dynamics Theory*, you got most of what you need to understand from this book. But the book is still worth reading. It explains extremely well how it is generally one person who puts in a ton of work, figures something out, then expresses extremely complex stuff in terms of a very simple model and then thousands or millions of people can understand that otherwise complex phenomenon.

Semantic Web for the Working Ontologist[99], by Dean Allenmang and Jim Hendler: (354 pages) The first to chapters are the most useful. This is an extremely technical book, but the first chapter (only 11 pages) explains the big picture of "smart applications". It also explains the difference between the power of a query language like SQL (relational database) and a graph pattern matching language (like XQuery). Querying can be an order of magnitude more powerful if the information is organized correctly.

Ontology for the Twenty First Century: An Introduction with Recommendations[100], by Andrew D. Spear: (132 pages) The introduction first 45 pages are the best. This chapter is highly influenced by this resource. This can be challenging to make your way through but if you really want to understand all of the issues in creating useful ontologies; reading this is worth the effort.

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[97] See, http://xbrl.squarespace.com/journal/2011/1/31/us-gaap-taxonomy-build-it-to-allow-reoganization.html

[98] See, http://xbrl.squarespace.com/journal/2014/7/20/updated-financial-report-semantics-and-dynamics-theory.html

[99] See, http://www.amazon.com/Semantic-Web-Working-Ontologist-Effective/dp/0123735564

[100] See, http://ifomis.uni-saarland.de/bfo/documents/manual.pdf

5. Understanding Basic Mechanics of a Digital Financial Report

In the section on knowledge engineering for accounting professionals we set the groundwork which we will not build upon.

Digital financial reports contain thousands and sometimes many thousands of details. These details can be grouped into *objective* mechanical aspects which can be automated using machines and *subjective* aspects which require the professional judgment of a skilled accountant. Information technology professionals creating software for business professionals need to be aware of the mechanical things and relations between things which make up a financial report in order to create software useful to business professionals. With useful software the mechanical aspects can be handled by software freeing accounting professionals to use their skills in area which are impossible to automate, areas which require the professional judgment of a skilled human.

5.1. Paper-based financial reports

The primary purpose of this section is to describe the mechanical aspects of a representational model of an XBRL-based digital financial report which was gleaned by reverse-engineering publically available public company XBRL-based financial filings submitted to the U.S. Securities and Exchange Commission (SEC). All public company XBRL-based financial reports must be valid business reports and valid financial reports. But not every financial report is a public company SEC-type financial report. Public company financial reports are a subtype of financial report the specifics of which are discussed in the next chapter.

While it is the case that every aspect of every XBRL-based financial report provided to the SEC by public companies are not 100% consistent with the representational model; enough aspects of enough of these reports point to what each report needs to look like in order for XBRL-based digital financial reporting to provide useful functionality.

5.2. Overview

By basic mechanics of a financial report we simply mean the basic important real world things that make up a financial report and the basic important relations between those real world things, the essence of a financial report. This is done so that we can then explain how a financial report works to a machine, such as a computer, so that the machine can help us create and make use of the information contained within financial reports.

With paper-based reports understanding these mechanical pieces and describing them is not important because tools used to create such paper-based reports are presentation oriented and have no knowledge of a financial report. Humans interact with these software tools used for creating financial reports by interacting with things such as paragraphs, tables, rows, columns, and cells.

These mechanical aspects are distinct from the subjective aspects which require judgment. The mechanical aspects are objective and require no judgment. The mechanical aspects relate more to logic, common sense, and mathematics. These subjective and therefore judgmental aspects have to do with *which* things exist in

the financial report, some aspects of the *values* of those things, how the values are *measured*, and so forth.

Our focus is on the mechanical aspects which are ruled by logic, sensibility, basic mathematics, and common sense. Subjective and therefore aspects which require the professional judgment of a skilled accountant are not addressed because they are not in scope.

5.3. Understanding things and relations between things in a financial report

As we mentioned in the section on knowledge engineering we use the following terms to discuss the things and relations between things which make up any domain of knowledge:

- **Thing**
- **Individual**
- **Class**
- **Relations between one class and another class**
- **Relations between one class and an individual**
- **Relations between one individual and another individual**

5.4. Understanding the notion of patterns

A pattern is a representation model or set of rules which are used to guide. Patterns are important to IT professionals. Computers can leverage patterns. Patterns are both a communications tool that can help business professionals and IT professionals communicate, functionality templates which can be leveraged to make software easier to create, and a specimen that exemplifies the ideal qualities of something.

Basically, patterns describe.

A pattern is something that recurs. The world is full of patterns and information technology engineers leverage these patterns when trying to get a computer to do something effectively and efficiently for humans. Understanding the patterns which exist can help make both building and using software easier.

Patterns perform two fundamental tasks. First, they enable implementation of functionality at a higher-level. So rather than working with low-level pieces, business professionals can interact with higher-level ideas. This is like working with "Lego blocks" to build something. Second, patterns provide boundaries. Boundaries are necessary in order to make a system work safely and predictably.

The following types patterns exist in digital financial reports:

- **Concept arrangement pattern**: Concept arrangement patterns are relations between the Concepts and Abstracts which make up a set of [Line Items]

    - Whole-part
        - Roll up
        - Roll forward
        - Adjustment
    - Is-a
        - Hierarchy (or Set)
        - Text Block
- **Member arrangement pattern**: Member arrangement patterns are relations between the set of [Member]s of an [Axis].
    - Whole-part
    - Is-a
- **Network arrangement pattern**: A network arrangement pattern is the sequence or order of the set of networks of a digital financial report
    - Is-a

Only identified patterns are allowed. If a new pattern is identified, that pattern can be added. See the appendix *Understanding why adding new patterns is both rare and not a significant constraint* and *Understanding that patterns maintenance is an evolutionary process* and *Understanding that patterns are finite (i.e. not infinite)*.

5.5. Understanding the notion of slot or opening

While a form is finite but inflexible, a financial report is finite and flexible. The difference between the two can be described using the notion of a "slot" or "opening". A form has no slots or openings. A form only has cells into which information may be placed.

A **slot** is simply the idea of an allotted place in an arrangement where something can be logically and sensibly placed. Slots standardize where a component can be edited and where it cannot be edited.

For example, suppose you wanted to add something to a roll up of property, plant and equipment as shown below:

Property, Plant and Equipment, by Component [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Property, Plant and Equipment, by Component [Roll Up]		
Land	1,000,000	1,000,000
Machinery and equipment, gross	2,000,000	2,000,000
Furniture and fixtures, gross	6,000,000	6,000,000
Accumulated depreciation	(1,000,000)	(1,000,000)
Property, plant and equipment, net	8,000,000	8,000,000

You cannot add a second total to a roll up as a roll up only has one total. It would not make logical sense to add a second total to a roll up. Other terms used to describe this are illogical or irrational. What makes sense is to add another line item to the total of the roll up, somewhere in the list of existing line items. One slot is adding a line item between *Land* and *Machinery and equipment, gross*. Another slot is adding a line item before the first item *Land*.

Further, *what* you add to the list is also constrained. For example, what you add needs to be a number as a roll up involves showing how some list of numbers rolls up. You would not add text. And it cannot be just any number, it needs to be an "as of" type number (as contrast to a "for the period" number from, say, the income statement). Why? Because all of the other numbers in the list are "as of" some balance sheet date, not "for the period" of some income statement or cash flow statement period.

There is another slot which makes sense in the information above. You can see that there are two periods. Adding information for a third or even more periods makes sense. It could also make sense to add an entirely new characteristic such as Geographic Area [Axis] and break down the information by that dimension.

Basically, it makes no sense to simply add information randomly or arbitrarily to the roll up. While every slot or opening where it makes sense to add information to the existing information above has not been pointed out, the set of examples provide should help you understand the notion of a slot.

5.6. Understanding the classes of a financial report

A class[101] is a set or *category of things* having some property or properties in common and differentiated from other things. For example, *Assets* is one thing. *Revenue* is another thing. Something cannot be both an asset and revenue; they are different classes of things. However, at another level, Assets is a concept and Revenues is a concept. And so from the perspective of a concept, they are both of the class concept[102]. While a comprehensive discussion of the notion of a class is beyond the scope of this document, it is important for business professionals to understand the notion of a class. IT professionals should realize that the term class is being used differently than how object oriented programming (OOP) uses this term.

A financial report problem domain is made up of classes of things. In fact, a financial report is finite in the sense that it is made up of exactly the following structural pieces or things which can be grouped into the following classes:

- Economic or accounting **entity** which creates a report
- **Report** which is created by an entity which contain a set of components
- **Component** which contains or groups a sets of facts
- **Characteristics** which describe and distinguish facts contained within a component from other facts
- **Facts** which are reported and can be organized into components and described by characteristics

[101] For more information on classes, see http://www.xbrlsite.com/2015/fro/us-gaap/html/Classes/

[102] Just like one person may call something "data" and another may call it "metadata", assigning classes can be subject to the perspective of the user of the class.

- **Blocks** which is a part[103] of a component, a component is made up of one to many blocks
- **Relations pattern** which can be either a "whole-part[104]" type relation, an "is-a" type relation, a concept arrangement pattern, or a business rule which describes relations; Concept characteristic-type relations pattern (called concept arrangement patterns also a type of whole-part or is-a relation) which can be a "roll up", a "roll forward", an "adjustment", or a "hierarchy"
- **Properties** of an economic/accounting entity, report, component, block, fact, characteristic, or relation pattern

So the salient things that make up a financial report fall into that finite set of distinct and identifiable classes. Each of those classes of things has different slots or openings into which things can be added.

Individual systems can be implemented differently and so they could operate differently. Generally, a system could add additional classes. However, a system must have all of the classes in the list above. It is perhaps the case that a system might eliminate the notion of a block by specifying that a component may only contain one concept arrangement pattern.

We are looking at the U.S. Securities and Exchange EDGAR system and the XBRL-based financial filings which go into that specific system.

5.7. Notion of Block

Because distinguishing a component and a block can be a little tricky, we wanted to provide some additional detail and examples which help make this idea more understandable. Consider the following financial report disclosure represented using XBRL:

Property, Plant and Equipment, by Component [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Property, Plant and Equipment, by Component [Roll Up]		
Land	1,000,000	1,000,000
Machinery and equipment, gross	2,000,000	2,000,000
Furniture and fixtures, gross	6,000,000	6,000,000
Accumulated depreciation	(1,000,000)	(1,000,000)
Property, plant and equipment, net	8,000,000	8,000,000

[103] A block is a sub-set of a component. For example, the disclosure Funding Status of Defined Benefit Plans is made up of two roll forwards, a roll up, and a hierarchy each of which is a block of the component, see http://www.xbrlsite.com/2013/ReportingTemplates/2013-05-15/Library/730000-003-FundingStatusOfDefinedBenefitPlans/Template.jpg

[104] Whole-part relations are a significant topic and beyond the scope of this document, for more information see http://xbrl.squarespace.com/journal/2015/1/20/toward-understanding-whole-part-relations.html

That disclosure is a roll up of the components that make up property, plant, and equipment, net. Basically there is a one-to-one correlation between the concept arrangement pattern (i.e. roll up) and the component.

Similarly, the following component contains one disclosure in one component:

Schedule of Accrued Liabilities [Line Items]	Period [Axis]		
	2013-01-01 - 2013-12-31	2012-01-01 - 2012-12-31	2011-01-01 - 2011-12-31
Balance at beginning of period	26,987,000	12,742,000	8,972,000
Acquisition			3,151,000
Deferral of new extended warranty revenue	20,191,000	22,344,000	8,659,000
Recognition of extended warranty deferred revenue	(12,789,000)	(8,099,000)	(8,040,000)
Balance at end of period	34,389,000	26,987,000	12,742,000

Again, there is a one-to-one correlation between the component and the concept arrangement pattern (i.e. this time a roll forward).

But now consider the component below. In that component you see one component but you see two concept arrangement patterns: a roll forward and then a roll up:

Restructuring Cost and Reserve [Line Items]	Period [Axis]					
	2010-01-01 - 2010-12-31			2009-01-01 - 2009-12-31		
	Restructuring Type [Axis]			Restructuring Type [Axis]		
	Facility Closing [Member]	Severance [Member]	All Restructuring Types [Domain]	Facility Closing [Member]	Severance [Member]	All Restructuring Types [Domain]
Restructuring Reserve [Roll Forward]						
Restructuring reserve, beginning balance	97,000,000	204,000,000	301,000,000	94,000,000	200,000,000	294,000,000
Restructuring charge	(1,000,000)	0	(1,000,000)	(4,000,000)	(4,000,000)	(8,000,000)
Cash payments	(4,000,000)	(4,000,000)	(8,000,000)	(6,000,000)	(6,000,000)	(12,000,000)
Accrual adjustment	0	(1,000,000)	(1,000,000)	(1,000,000)	0	(1,000,000)
Translation adjustment	30,000,000	5,000,000	35,000,000	14,000,000	14,000,000	28,000,000
Restructuring reserve, ending balance	122,000,000	204,000,000	326,000,000	97,000,000	204,000,000	301,000,000
Restructuring Reserve [Roll Up]						
Current portion of restructuring reserve	96,000,000	204,000,000	300,000,000	96,000,000	204,000,000	300,000,000
Long-term portion of restructuring reserve	26,000,000	0	26,000,000	1,000,000	0	1,000,000
Restructuring reserve	122,000,000	204,000,000	326,000,000	97,000,000	204,000,000	301,000,000

In order to maintain a one-to-one correlation between a piece of the report and the concept arrangement pattern used to represent the piece of the report, the notion of the *block* is used.

By thinking of the one component as two blocks, each with a one-to-one relation between the represented information and the concept arrangement pattern, software can help business professionals using and creating the information in many ways.

Accountants have the option of combining information in different ways when they want to present their disclosures. But they have far fewer options when it comes to representing the information in logical, sensible, and mathematically correct ways.

Not understanding the information makes it harder to create and harder to use the information.

Consider the component taken from an XBRL-based public company financial filing submitted to the SEC below. The component contains six different blocks of information: one hierarchy and five roll ups. But it is harder to understand the information because the pieces are not separated.

Software can create the separations for business users making use of the information within a component. Different disclosures can be identified by their structural signatures. A roll up always has (or always should have) XBRL calculation relations expressed. A roll forward always has an XBRL preferred label role for the start date and another for the end date of the roll forward. These structural signatures can be used by software to help business users making use of reported information. The more creators of information help the software, the better the experience software can provide to business users.

Commitments (Details) (USD $) In Millions, unless otherwise specified	12 Months Ended		
	Oct. 31, 2012	Oct. 31, 2011	Oct. 31, 2010
Commitments			
Rent expense	$ 1,012	$ 1,042	$ 1,062
Sublease rental income	37	38	46
Property under capital lease	882	577	
Accumulated depreciation on property under capital lease	453	454	
Minimum lease payments, sublease rental income			
Minimum lease payments, 2013	780		
Minimum lease payments, 2014	665		
Minimum lease payments, 2015	517		
Minimum lease payments, 2016	351		
Minimum lease payments, 2017	218		
Minimum lease payments, thereafter	805		
Minimum lease payments, total	3,336		
Less: Sublease rental income, 2013	(28)		
Less: Sublease rental income, 2014	(23)		
Less: Sublease rental income, 2015	(18)		
Less: Sublease rental income, 2016	(9)		
Less: Sublease rental income, 2017	(4)		
Less: Sublease rental income, thereafter	(12)		
Sublease rental income, total	(94)		
Minimum lease payments net of sublease rental income, 2013	752		
Minimum lease payments net of sublease rental income, 2014	642		
Minimum lease payments net of sublease rental income, 2015	499		
Minimum lease payments net of sublease rental income, 2016	342		
Minimum lease payments net of sublease rental income, 2017	214		
Minimum lease payments net of sublease rental income, thereafter	793		
Minimum lease payments net of sublease rental income, total	3,242		
Capital lease commitments			
Capital lease commitments, 2013	59		
Capital lease commitments, 2014	240		
Capital lease commitments, 2015	11		
Capital lease commitments, 2016	7		
Capital lease commitments, 2017	4		
Capital lease commitments, thereafter	33		
Capital lease commitments, total	354		
Less: Interest payments, 2013	(8)		
Less: Interest payments, 2014	(6)		
Less: Interest payments, 2015	(3)		
Less: Interest payments, 2016	(2)		
Less: Interest payments, 2017	(2)		
Less Interest payments, thereafter	(12)		
Interest payments, total	(33)		

Here is one final example. Below you see four blocks: the first two are [Roll Forward]s, the third a [Roll Up], and the fourth a [Hierarchy]. The two [Roll Forward]s are connected to the [Roll Up], the ending balances of the [Roll Forward]s are the items which are being rolled up in the [Roll Up]. Because the information is represented correctly and because the rendering engine which produced the renderings from the machine-readable representation, the information is easy to understand.

In addition to the concept arrangement patterns which show the organization of the [Line Items] (which are in the rows on the left of the rendering), the information is further distinguished using the *Defined Benefit Plan Category [Axis]*.

A block is a combination of a *concept arrangement pattern* and *member arrangement patterns* which work together to distinguish reported facts.

Defined Benefit Plan Disclosure [Line Items]	Period [Axis]					
	2011-01-01 - 2011-12-31			2010-01-01 - 2010-12-31		
	Defined Benefit Plan Category [Axis]			Defined Benefit Plan Category [Axis]		
	U.S. Pension Benefits [Member]	Non-U.S. Pension Benefits [Member]	Other Postretirement Benefits [Member]	U.S. Pension Benefits [Member]	Non-U.S. Pension Benefits [Member]	Other Postretirement Benefits [Member]
Change in benefit obligation [Roll Forward]						
Benefit obligation at beginning of year	444,000,000	593,000,000	166,000,000	375,000,000	327,000,000	157,000,000
Service cost	38,000,000	9,000,000	8,000,000	32,000,000	8,000,000	10,000,000
Interest cost	21,000,000	33,000,000	8,000,000	22,000,000	26,000,000	9,000,000
Actuarial loss	43,000,000	25,000,000	28,000,000	31,000,000	4,000,000	10,000,000
Benefits paid	(19,000,000)	(16,000,000)	(14,000,000)	(47,000,000)	(12,000,000)	(15,000,000)
Curtailment	0	(4,000,000)	0	0	(1,000,000)	0
Acquisitions of businesses	0	2,000,000	0	34,000,000	253,000,000	27,000,000
Plan amendments	0	0	0	0	0	(32,000,000)
Other changes	(3,000,000)	1,000,000	0	(3,000,000)	2,000,000	0
Exchange rate adjustments	0	0	0	0	(14,000,000)	0
Benefit obligation at end of year	524,000,000	643,000,000	196,000,000	444,000,000	593,000,000	166,000,000
Change in plan assets [Roll Forward]						
Fair value of plan assets at beginning of year	416,000,000	474,000,000	0	346,000,000	248,000,000	0
Actual return on plan assets	(5,000,000)	38,000,000	0	48,000,000	36,000,000	0
Employer contributions	43,000,000	28,000,000	14,000,000	72,000,000	52,000,000	15,000,000
Acquisitions of businesses	0	0	0	0	160,000,000	0
Administration expenses	(2,000,000)	1,000,000	0	(3,000,000)	1,000,000	0
Exchange rate adjustments	0	1,000,000	0	0	(11,000,000)	0
Fair value of plan assets at end of year	433,000,000	526,000,000	0	416,000,000	474,000,000	0
Funding Status [Roll Up]						
Fair value of plan assets	433,000,000	526,000,000	0	416,000,000	474,000,000	0
Benefit obligation	524,000,000	643,000,000	196,000,000	444,000,000	593,000,000	166,000,000
Funded status - underfunded at end of year	(91,000,000)	(117,000,000)	(196,000,000)	(28,000,000)	(119,000,000)	(166,000,000)
Accumulated Benefit Obligation [Hierarchy]						
Accumulated benefit obligation	491,000,000	616,000,000	196,000,000	421,000,000	553,000,000	166,000,000

5.8. Realizing that creating a financial report is about creating subclasses or individuals and adding things into slots

As stated, the structural pieces or things which make up a financial report can be grouped into classes. No new classes can be added, you may only use existing

classes[105]. Classes may never be redefined; you cannot arbitrarily change the meaning of a class. However, subclasses can be added and identified as being associated with one of those existing classes of things. But subclasses can only be added as specified by the system. Individuals can be created and specified as being a member of one class or another, you simple cannot create an individual which is associated with nothing or which is two things at the same time.

And so:

- **Adding new economic/accounting entities**: (Individual) An economic/accounting or reporting entity is created by creating a new instance of identifier. For example the CIK number of a public company which reports to the SEC.
- **Adding new report**: (Individual) A new report is created by creating a new report instance. For example, Microsoft submits a new financial report for fiscal year ended 2014.
- **Adding a new characteristic:** (Class and/or Individual) A new characteristic can be added but the characteristic MUST be distinguished as being either a "whole-part" or "is-a" type of relation or some existing subclass of existing relations (which must be one of those two). For example, Microsoft uses the existing characteristic "Legal Entity [Axis]" (which is a whole-part type relation) or Microsoft creates the characteristic "Tax Entity [Axis]" and distinguishes that characteristic as being a "whole-part" type of relation.
- **Adding new concept characteristic:** (Class and/or Individual) A new concept can be added but the concept MUST be distinguished as being a subclass of some existing concept or distinguished as being a new type of class (if that is allowed). For example, Microsoft might add a new concept to its balance sheet such as "Ultra-tangible asset"; however it MUST NOT break the rules of a "roll up" because a balance sheet is a roll up. Further, the added concept MUST be identified as a subclass of something that exists on a balance sheet which can contain ONLY assets, liabilities, or equity.
- **Adding new disclosure (component or block):** (Class and/or Individual) A disclosure is in essence a set of facts which must be disclosed. A set of facts is represented as a component and that component might have one or many blocks. To add a new disclosure, a reporting entity simply creates a new component and/or block individual. That individual of the class component MUST be (i.e. follow) the relations patterns of the existing component which the individual is a member of. For example, if Microsoft creates a "balance sheet" individual, it must associate that individual with the existing class "balance sheet" and therefore must follow the relation rules of a roll up because the existing component "balance sheet" is a roll up. Why? Because a balance sheet is a roll up, it is not ever a roll forward. Now, a reporting entity could also, if they desired, create a new subclass of "balance sheet" called "my balance sheet" and associate it with the class "balance sheet". Or, a company could create an entirely new disclosure such as "cash and cash equivalents by county", associate that disclosure not with some existing disclosure but rather with the root class "component" and then provide a

[105] Individual systems can add whatever classes, relations between classes, and properties that they want. Here we are assuming the SEC EDGAR system and XBRL-based financial filings which go into that system only.

completely new disclosure. However, what the reporting entity may NOT do is create some new relations pattern, it must use existing relations patterns (i.e. no new relation patterns can be added). Basically, any individual MUST follow the rules as must any new class.

- **Adding facts**: (Individual) A fact is always an individual. Facts are put into blocks which go into components. Facts are never "free floating in space". Every fact has distinguishing aspects to make them identifiable from other reported facts. Facts are described by characteristics, exist within a report, and are reported by an economic/accounting entity. For example, the accounting entity Microsoft might report the fact 1,000,000 which relates to the consolidated entity, to the current balance sheet date of December 31, 2014, be reported in US Dollars, and report the balance sheet line item Cash and cash equivalents. That fact might be in the component balance sheet and has a relation between the concept Current assets in that it rolls up to that total.
- **Adding new properties**: New properties MUST NEVER be added, XBRL-based financial filings to the SEC does not allow the addition of new properties, there is no "slot" available where new properties may be added.

Different systems can have different rules for allowing new classes, subclasses, relations between classes, or properties. System boundaries can be extended by adding new relation patterns. New relation patterns must be consciously and formally added in a controlled and coordinated manner only by system implementers before any new pattern is allowed to be used. System boundaries can be extended by adding new classes or properties. New classes and new properties must be consciously and formally added in a controlled and coordinated manner only.

5.9. Understanding why adding new patterns is both rare and not a significant constraint

Adding new patterns is both rare and not a significant constraint. While this notion might seem absurd or unintuitive, it is important to look at empirical evidence to understand why this is the case.

If one were to observe XBRL-based financial filings, one would realize that 98% or more of public company financial reports contain [Line Items] which contain concepts and abstracts which follow these concept arrangement patterns:

- **Text block**
  - Level 1 Note Level Text Block
  - Level 2 Policy Level Text Block
  - Level 3 Disclosure Level Text Block
- **Roll Up**: Concept A + Concept B + Concept *N* = Total
- **Roll Forward**: Beginning balance + Additions – Subtractions – Ending balance
- **Hierarchy**: No mathematical relationships
- **Adjustment**: Originally stated balance + Adjustments = Restated balance

- **Roll Forward Info**: Beginning balance info + Additions info – Subtractions info – Ending balance info (there are no mathematical relations, but information for the beginning and ending balances must be distinguished)

Similarly, each [Axis] falls into one of two categories and describes the [Member]s of that [Axis] as being one of the following two member arrangement patterns:

- **Whole-part**: Characteristic describes something composed exactly of their parts and nothing else or more where the parts add up to the whole
- **Is-a**: Characteristic describes some list but the list does not add up mathematically

Consider the following theory: A combination of those *concept arrangement patterns* and *member arrangement patterns* describes every component of every report of every reporting entity which submits XBRL-based financial information to the SEC.

That theory is speculated to be true for 98% of the components of public company financial reports. Being conservative, we leave room for 2% of report components which might deviate from these rules because they are not structural patterns described in this document. Basically, the following spectrum delineates all possible alternatives:

1. A reporting entity report component follows (**is consistent with**) existing concept arrangement patterns and existing member arrangement patterns.
2. A reporting entity component DOES NOT FOLLOW, however SHOULD FOLLOW (**is inconsistent with**) existing concept arrangement patterns and existing member arrangement patterns. HOWEVER, after the inconsistency is corrected within the report, the reporting entity report component follows (**is consistent with**) existing patterns.
3. A reporting entity component DOES NOT FOLLOW, but either a concept arrangement pattern or member arrangement pattern IS MISSING from the list of allowed patterns. The pattern is logical, rational and sensible and would NOT RENDER the system NOT DECIDABLE. THEREFORE, the pattern should be added (**is consistent with**).
4. A reporting entity component DOES NOT FOLLOW, but either a concept arrangement pattern or member arrangement pattern IS MISSING from the list of allowed patterns. The pattern is logical, rational and sensible HOWEVER; the pattern (a) can be reduced down to a less complex pattern and (b) if added it WOULD RENDER THE SYSTEM NOT DECIDABLE. THEREFORE, the pattern should NOT BE ADDED. Rather, the reporting entity should change how they report information to keep the overall system safe (**is consistent with**).
5. A reporting entity component follows (**is consistent with**) the existing [Hierarchy] concept arrangement patterns and an existing member arrangement pattern; HOWEVER the pattern is in reality not a [Hierarchy] but rather some other unsupported mathematical relation or some other unsupported member arrangement pattern. While not optimal because specific information which could be verified to be consistent is not being verified, this is still on par with current practices. Currently, a [Roll Forward] is a known and a commonly used pattern. The pattern is identifiable, but has no computation articulated.

And so either a filer is already consistent with the existing system (#1), or should be consistent with the existing system (#2). It is possible that a reporting entity is using a logical and sensible concept arrangement pattern or member arrangement pattern that is missing (#3); and if so, that pattern should be added to the system. It is possible that a reporting entity is using a logical and sensible concept arrangement pattern or member arrangement pattern; however, (a) that pattern can be broken down into a simpler, less complex pattern an (b) if the pattern were added to the system it would make the system not decidable and therefore should not be added to the system.

And, as discussed in the next section, there is always a fallback position (#5). Everything can be represented as a [Hierarchy] concept arrangement pattern. Other concept arrangement patterns simply add additional rules, generally mathematical computations. This allows new patterns to evolve. This is explained in more detail in the next section.

5.10. Understanding that pattern maintenance is an evolutionary process

Every concept arrangement pattern is some [Hierarchy][106] of concepts. Other non-[Hierarchy] concept arrangement patterns add some sort of mathematical computation. For example,

- A [Roll Up] is simply a [Hierarchy] with the addition of XBRL calculation relations which articulate the information about how the concepts roll up.
- A [Roll Forward] is simply a [Hierarchy] with the addition of a preferred label role to differentiate the beginning and ending instant concept.
- An [Adjustment] is simply a [Hierarchy] with the addition of a preferred label role to differentiate the originally stated and restated balances plus a member arrangement pattern to distinguish the Report Date [Axis].
- A [Text Block] is a [Hierarchy] which has only one concept which is of a specific data type.

Basically, any information can be represented as a [Hierarchy]. The down side of representing information in this manner if it really is some other pattern is that you do not provide metadata which software can use to assure that what is represented is consistent with reality. The information might be consistent with the knowledgebase of information, but that is only because the rules are not included in the knowledgebase. What that means is that the information needs to be verified using manual processes because consistency cannot be determined using automated processes because there are no machine-readable business rules.

This situation is not optimal, but it is also not the end of the world either. As was stated above, this situation is on par with current XBRL-based public company financial filings in that [Roll Forward] concept arrangement patterns in existing SEC filings do not provide business rules for the [Roll Forward].

What this means is that there is already a process to allow patterns to evolve.

[106] I really don't like the name [Hierarchy] because everything is a hierarchy. A better term might be [Set] or some other term.

5.11. Understanding that patterns are finite (i.e. not infinite)

To understand that it is not an overwhelming task to inventory all patterns and add new patterns to the system, consider the notion of report frame patterns[107]. If you look closely at the report frame patterns, this is what you observe:

- Every public company can be grouped into one of 95 report frames.
- Of the approximately 8,000 reporting entities in scope (funds and trusts are excluded as they follow other patterns which are not of interest); 90% of all public companies fall into one of 13 report frames. The remaining 10% of reporting entities use the other 82 report frames.
- Some of the report frames which are used are likely illegal. For example, why would a commercial and industrial company report using an unclassified balance sheet? Meaning, some existing report frames need to be removed.
- It is highly-likely that some report frames will have only 1 reporting entity, for example JPMorgan seems to fall into that category. Nothing wrong with that.
- It is highly-likely that there are between perhaps 100 to maybe even 250 additional report frames. It is of no consequence to have 100 or even 250 additional report frames.

Every other class works precisely the same way. Some finite list of subclasses can exist. And so, the system is finite, the system has boundaries, but the system is flexible but only where specific flexibility is exposed.

5.12. Understanding technical syntax rules and workflow/process rules

There has not really been much emphasis on technical syntax rules and workflow/process rules, the primary focus is on business domain semantic rules.

The reason for less effort in explaining technical syntax rules is because of the following:

- XBRL technical syntax rules were created and interoperability between software is excellent due to a publically available conformance suite provided by XBRL International.
- Because of the first point; XBRL-based digital financial reports provided to the SEC by public companies are 99.9% consistent with the XBRL technical syntax rules.
- Business professionals should never be exposed to technical syntax; software should hide all aspects of technical syntax from business professionals.

Basic workflow/process rules are worth covering a little because that would yield important useful information. However, there has not been a lot of focus on workflow/process rules so we really don't know the full extent of what workflow/process rules are necessary.

However, we do understand the basic, fundamental rules which are necessary for any system to work with a digital financial report.

[107] For more information on report frame patterns, see http://www.xbrlsite.com/2015/fro/us-gaap/html/ReportFrames/

Consider a simple query of two concepts: *Assets* and *Liabilities and Equity*. In order to extract that information from any XBRL-based financial filing using a machine-based process the following process needs to be followed:

1. Software MUST locate each report you want to query.
2. The report MUST be valid XBRL technical syntax. If the technical syntax is invalid, you may or may not get the correct results.
3. Software MUST locate the appropriate reporting units (currency). In the case of public company financial reports, 99% of entities report using US Dollars. However, 1% use other currencies as the reporting units.
4. Software MUST appropriately identify the root reporting entity in the report. Generally, this is the consolidated entity but it could be a parent holding company or some other accounting entity.
5. Software MUST appropriately locate the current balance sheet date. Generally you want information about the current balance sheet data and not the prior balance sheet.
6. Software MUST find the appropriate US GAAP concept used to express *Assets* which is us-gaap:Assets.
7. Software MUST find appropriate US GAAP concept for *Liabilities and Equity*. This is a little harder because there are multiple possible concepts: us-gaap:LiabilitiesAndStockholdersEquity or us-gaap:LiabilitiesAndPartnersCapital.
8. Software MUST check the returned information to assure that it is consistent with what is expected, the business domain rule that "Assets = Liabilities and Equity".

That is an overview of the workflow/process to obtain a basic set of information from the knowledgebase of XBRL-based public company financial filings. And here are the results of that query for every financial report in that data set:

xbrl:Entity	Legal Entity	Fiscal Period	Fiscal Year	Assets	Liabilities and Equity	Units	Difference in Value
All CIK numbers	Root economic entity	FY	2001	280	280	iso4217:USD	0
All CIK numbers	Root economic entity	FY	2009	31,586,555,000	31,586,555,000	iso4217:USD	0
All CIK numbers	Root economic entity	FY	2010	23,061,516,000	23,061,516,000	iso4217:CAD	0
All CIK numbers	Root economic entity	FY	2010	8,833,200,000	8,833,200,000	iso4217:GBP	0
All CIK numbers	Root economic entity	FY	2010	33,205,444,569,755	33,235,543,477,631	iso4217:USD	30,098,907,876
All CIK numbers	Root economic entity	FY	2011	45,216,467	45,216,467	iso4217:AUD	0
All CIK numbers	Root economic entity	FY	2011	110,885,000	110,885,000	iso4217:BRL	0
All CIK numbers	Root economic entity	FY	2011	28,708,716,218	28,708,716,218	iso4217:CAD	0
All CIK numbers	Root economic entity	FY	2011	1,226,733,000	1,226,733,000	iso4217:EUR	0
All CIK numbers	Root economic entity	FY	2011	7,938,800,000	7,938,800,000	iso4217:GBP	0
All CIK numbers	Root economic entity	FY	2011	1,565,000	1,565,000	iso4217:ILS	0
All CIK numbers	Root economic entity	FY	2011	46,395,324,314,234	46,165,763,878,111	iso4217:USD	(229,560,436,123)
All CIK numbers	Root economic entity	FY	2012	49,066,850	49,066,850	iso4217:AUD	0
All CIK numbers	Root economic entity	FY	2012	32,470,161,238	32,470,161,238	iso4217:CAD	0
All CIK numbers	Root economic entity	FY	2012	1,303,349,000	1,303,349,000	iso4217:EUR	0
All CIK numbers	Root economic entity	FY	2012	10,504,300,000	10,504,300,000	iso4217:GBP	0
All CIK numbers	Root economic entity	FY	2012	47,493,211,088,244	47,307,285,874,940	iso4217:USD	(185,925,213,304)
All CIK numbers	Root economic entity	FY	2013	54,642,443	54,642,443	iso4217:AUD	0
All CIK numbers	Root economic entity	FY	2013	39,919,462,935	39,919,385,738	iso4217:CAD	(77,197)
All CIK numbers	Root economic entity	FY	2013	13,120,000	13,120,000	iso4217:EUR	0
All CIK numbers	Root economic entity	FY	2013	48,909,115,040,682	48,735,740,980,605	iso4217:USD	(173,374,060,077)
All CIK numbers	Root economic entity	FY	2014	342,493,649,881	342,493,649,881	iso4217:USD	0
				176,531,415,952,227	175,972,655,073,402		(558,760,878,825)
							-0.3%

The results[108] show that most of the balance sheets balance, Assets = Liabilities and Equity. Some are inconsistent with what you would expect. The total inconsistency is .3% which is not too bad. However, the information needs to be 100% consistent in order to not get humans involved to figure out what is causing the inconsistencies.

5.13. Proving the structural mechanics using XBRL-based public company financial filings

How can you tell if the mechanics that this paper describes is correct? It is actually rather easy: look at publically available XBRL-based financial filings which public companies report to the SEC. First though, you need to reconcile the mechanical representation with an implementation of the mechanical representation in software[109]. While it is beyond the scope to do a detailed reconciliation between the semantics use in this document, the terms use by software and the US GAAP XBRL Taxonomy and SEC, and the XBRL technical syntax specification; it is necessary to provide an overview because we need to shift terminology slightly. This is that overview which reconciles terminology:

Term used in this document	**Term used by software**
Economic or accounting entity	Reporting Entity CIK (XBRL context entity identifier)

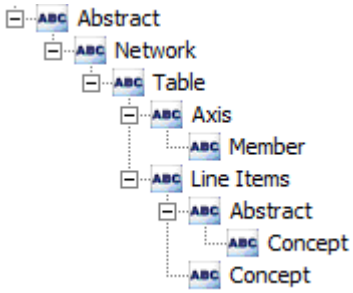
[108] Query and results provided by SECXBRL.info which is a commercial software application, see http://app.secxbrl.info/

[109] Reconciliation of Financial Report Semantics and Dynamics Theory, to US GAAP XBRL Taxonomy Architecture and SEC implementation, to XBRL technical syntax, see http://www.xbrlsite.com/2012/Library/SemanticObjectlReconciliation.pdf

Report	XBRL instance document + XBRL taxonomy
Component	XBRL **Network** + [**Table**]
Characteristic (other than concept)	[**Axis**] + [**Member**]
Characteristic (concept)	[**Line Items**] + **Concept**
Fact	Fact
Block	XBRL Network + [**Table**] + [**Abstract**]
Relations pattern	NOT IN SCOPE
Properties	NOT IN SCOPE

That is a rough explanation of the terms we use to describe the mechanics of a financial report and terms use by software applications, SEC filings, and the US GAAP XBRL Taxonomy. A complete reconciliation of terminology is beyond the scope of this document and would cause more confusion and complexity that most business professionals would tolerate.

To keep this simple, the implementation of the mechanics can be distilled down to the following classes of report elements: Network, Table, Axis, Member, Line Items, Abstract and Concept. They are roughly related as follows:



Software was used to query the mechanical structure of 6,674 XBRL-based public company 10-K filings for primarily fiscal year 2013 and the following results were obtained:

		Parent						
		Network 477,041	Table 232,230	Axis 386,912	Member 1,216,391	LineItems 232,690	Abstract 732,409	Concept 3,165,249
Child	Network	0	0	0	0	0	0	0
	Table	1,261	1	0	0	45	230,899	24
	Axis	1	386,888	0	0	3	20	0
	Member	3	0	450,091	766,221	4	72	0
	LineItems	183	232,181	0	0	107	217	2
	Abstract	474,310	22	0	1	113,059	144,471	546
	Concept	46	26	11	137	1,222,427	1,929,257	13,346

In the columns are the mechanical class of pieces which serve as the parent for some child mechanical class of piece: Network, Table, Axis, and so on. In the rows are the child mechinacal pieces: Network, Table, Axis, and so on. The cells show the number of relations which exist in the set of 6,674 digital financial reports.

This second graphic of the same information will help you to interpret and understand the results:

		Parent						
		Network 477,041	Table 232,230	Axis 386,912	Member 1,216,391	LineItems 232,690	Abstract 732,409	Concept 3,165,249
Child	Network	0	0	0	0	0	0	0
	Table	1,261	1	0	0	45	230,899	24
	Axis	1	386,888	0	0	3	20	0
	Member	3	0	450,091	766,221	4	72	0
	LineItems	183	232,181	0	0	107	217	2
	Abstract	474,310	22	0	1	113,059	144,471	546
	Concept	46	26	11	137	1,222,427	1,929,257	13,346

What the graphic says about the reltionships between the structural pieces of the digital financial reports is the following:

- Of the 386,912 [Axis] which exist in the report, there are ZERO occasions where a parent [Axis] has a child [Axis].
- Of the 232,690 [Line Items] which exist in the report, there are 1,222,427 occasions where the parent [Line Items] has a child which is a Concept.

Without going into a lot of detail, the following graphic shows what the above graphic means: the allowed and disallowed relations between the mechanical building blocks: Network, Table, Axis, Member, LineItems, Abstract and Concept.

		Parent						
		Network	Table	Axis	Member	LineItems	Abstract	Concept
Child	Network	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL
	Table	OK	Disallowed	Disallowed	Disallowed	Disallowed	OK	Disallowed
	Axis	Disallowed	OK	Disallowed	Disallowed	Disallowed	Disallowed	Disallowed
	Member	Disallowed	Disallowed	OK	OK	Disallowed	Disallowed	Disallowed
	LineItems	Disallowed	OK	Disallowed	Disallowed	Disallowed	Disallowed	Disallowed
	Abstract	OK	Disallowed	Disallowed	Disallowed	OK	OK	Not advised
	Concept	Not advised	Disallowed	Disallowed	Disallowed	OK	OK	Not advised

The point here is not to have a debate about what should be allowed and what should not be allowed. While that debate and perhaps even a theoretical or philosophical discussion about the merits of allowing or disallowing relations could prove useful, that is not the point.

The point is this: First, if a profound majority of XBRL-based financial reports are represented in a certain way, it is very difficult to say that the approach is wrong. Not impossible because the majority could be incorrect in certain occasions.

But second, and most importantly, if rules can be created and enforced by software and it is possible to have 100% agreement then why is that not done?

Look at the graphic again. Notice that there are ZERO occasions where a Network is a child of any other mechanical structure. Why is that? The reason that there are ZERO is that the XBRL technical specification states that such relations are not allowed, and the XBRL consistency suite tests to make sure software does not make this mechanical mistake.

And so an obvious question is this: why are not other mechanical aspects not enforced in this manner?

5.14. Proving other mechanics using XBRL-based public company financial filings

The following is a summary of the consistency of other mechanics of XBRL-based public company 10-K financial filings from the same set of 6,674 filings for FY 2013, an earlier set of similar 10-K financial reports for FY 2012, and for another similar set of 10-Q and 10-K financial filings for FY 2014[110].

#	Goal or Desired State	Process tests	FY 2014	FY 2013	FY 2012
1	Consistent XBRL technical syntax	Automated XBRL technical syntax error checks	99.9%	99.9%	99.9%
2	Consistent EDGAR Filer Manual (EFM) syntax/semantics	Automated EFM syntax and semantics error checks	98.0%	97.9%	80.5%
3	Consistent report level structure	Automated model structure error checks	97.6%	95.8%	97.9%
4	Detectable economic entity or accounting entity or "root reporting entity" or "entity of focus"	Successful and unambiguous identification of the "entity of focus"	99.3%	99.2%	98.8%
5	Detectable and unambiguous current period balance sheet and income statement period dates	Successful and unambiguous identification of the current balance sheet date and income statement period	98.4%	99.3%	99.8%
6	Detectable and unambiguous set of fundamental reported facts and intact relations between those fundamental facts which prove trustworthy nature of information	Automated verification checks to be sure fundamental accounting concepts are distinguishable/decipherable and the relations between those fundamental concepts are intact/sound	97.9%	97.8%	97.9%
7	Detectable basic primary financial statement roll up computations are intact which prove trustworthy nature of information	Automated verification checks for existence of business rules which articulate these basic primary financial statement relations and successful passing of these business rules	90.7%	90.1%	84.9%

The primary point here is that if you look at the columns on the right for FY 2014, FY 2013, and FY 2012 you notice that testing against what we would expect yielded a very high number of XBRL-based public company financial reports that are consistent with those expectations.

[110] Not all FY 2014 financial filings have been submitted to the SEC as of the date of this document, so the latest 10-Q was used if the 10-K was not available.

5.15. Distinguishing between a component and a block

Because distinguishing a component and a block can be a little tricky, we wanted to provide some additional detail and examples which help make this idea more understandable. Consider the following financial report disclosure represented using XBRL:

Property, Plant and Equipment, by Component [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Property, Plant and Equipment, by Component [Roll Up]		
Land	1,000,000	1,000,000
Machinery and equipment, gross	2,000,000	2,000,000
Furniture and fixtures, gross	6,000,000	6,000,000
Accumulated depreciation	(1,000,000)	(1,000,000)
Property, plant and equipment, net	8,000,000	8,000,000

That disclosure is a roll up of the components that make up property, plant, and equipment, net. Basically there is a one-to-one correlation between the concept arrangement pattern (i.e. roll up) and the component.

Similarly, the following component contains one disclosure in one component:

Schedule of Accrued Liabilities [Line Items]	Period [Axis]		
	2013-01-01 - 2013-12-31	2012-01-01 - 2012-12-31	2011-01-01 - 2011-12-31
Balance at beginning of period	26,987,000	12,742,000	8,972,000
Acquisition			3,151,000
Deferral of new extended warranty revenue	20,191,000	22,344,000	8,659,000
Recognition of extended warranty deferred revenue	(12,789,000)	(8,099,000)	(8,040,000)
Balance at end of period	34,389,000	26,987,000	12,742,000

Again, there is a one-to-one correlation between the component and the concept arrangement pattern (i.e. this time a roll forward).

But now consider the component below. In that component you see one component but you see two concept arrangement patterns: a roll forward and then a roll up:

Restructuring Cost and Reserve [Line Items]	Period [Axis]					
	2010-01-01 - 2010-12-31			2009-01-01 - 2009-12-31		
	Restructuring Type [Axis]			Restructuring Type [Axis]		
	Facility Closing [Member]	Severance [Member]	All Restructuring Types [Domain]	Facility Closing [Member]	Severance [Member]	All Restructuring Types [Domain]
Restructuring Reserve [Roll Forward]						
Restructuring reserve, beginning balance	97,000,000	204,000,000	301,000,000	94,000,000	200,000,000	294,000,000
Restructuring charge	(1,000,000)	0	(1,000,000)	(4,000,000)	(4,000,000)	(8,000,000)
Cash payments	(4,000,000)	(4,000,000)	(8,000,000)	(6,000,000)	(6,000,000)	(12,000,000)
Accrual adjustment	0	(1,000,000)	(1,000,000)	(1,000,000)	0	(1,000,000)
Translation adjustment	30,000,000	5,000,000	35,000,000	14,000,000	14,000,000	28,000,000
Restructuring reserve, ending balance	122,000,000	204,000,000	326,000,000	97,000,000	204,000,000	301,000,000
Restructuring Reserve [Roll Up]						
Current portion of restructuring reserve	96,000,000	204,000,000	300,000,000	96,000,000	204,000,000	300,000,000
Long-term portion of restructuring reserve	26,000,000	0	26,000,000	1,000,000	0	1,000,000
Restructuring reserve	122,000,000	204,000,000	326,000,000	97,000,000	204,000,000	301,000,000

In order to maintain a one-to-one correlation between a piece of the report and the concept arrangement pattern used to represent the piece of the report, the notion of the *block* is used.

By thinking of the one component as two blocks, each with a one-to-one relation between the represented information and the concept arrangement pattern, software can help business professionals using and creating the information in many ways.

Accountants have the option of combining information in different ways when they want to present their disclosures. But they have far fewer options when it comes to representing the information in logical, sensible, and mathematically correct ways.

Not understanding the information makes it harder to create and harder to use the information.

Consider the component taken from an XBRL-based public company financial filing submitted to the SEC below. The component contains six different blocks of information: one hierarchy and five roll ups. But it is harder to understand the information because the pieces are not separated.

Software can create the separations for business users making use of the information within a component. Different disclosures can be identified by their structural signatures. A roll up always has (or always should have) XBRL calculation relations expressed. A roll forward always has an XBRL preferred label role for the start date and another for the end date of the roll forward. These structural signatures can be used by software to help business users making use of reported information. The more creators of information help the software, the better the experience software can provide to business users.

Commitments (Details) (USD $) In Millions, unless otherwise specified	12 Months Ended		
	Oct. 31, 2012	Oct. 31, 2011	Oct. 31, 2010
Commitments			
Rent expense	$ 1,012	$ 1,042	$ 1,062
Sublease rental income	37	38	46
Property under capital lease	882	577	
Accumulated depreciation on property under capital lease	453	454	
Minimum lease payments, sublease rental income			
Minimum lease payments, 2013	780		
Minimum lease payments, 2014	665		
Minimum lease payments, 2015	517		
Minimum lease payments, 2016	351		
Minimum lease payments, 2017	218		
Minimum lease payments, thereafter	805		
Minimum lease payments, total	3,336		
Less: Sublease rental income, 2013	(28)		
Less: Sublease rental income, 2014	(23)		
Less: Sublease rental income, 2015	(18)		
Less: Sublease rental income, 2016	(9)		
Less: Sublease rental income, 2017	(4)		
Less: Sublease rental income, thereafter	(12)		
Sublease rental income, total	(94)		
Minimum lease payments net of sublease rental income, 2013	752		
Minimum lease payments net of sublease rental income, 2014	642		
Minimum lease payments net of sublease rental income, 2015	499		
Minimum lease payments net of sublease rental income, 2016	342		
Minimum lease payments net of sublease rental income, 2017	214		
Minimum lease payments net of sublease rental income, thereafter	793		
Minimum lease payments net of sublease rental income, total	3,242		
Capital lease commitments			
Capital lease commitments, 2013	59		
Capital lease commitments, 2014	240		
Capital lease commitments, 2015	11		
Capital lease commitments, 2016	7		
Capital lease commitments, 2017	4		
Capital lease commitments, thereafter	33		
Capital lease commitments, total	354		
Less: Interest payments, 2013	(8)		
Less: Interest payments, 2014	(6)		
Less: Interest payments, 2015	(3)		
Less: Interest payments, 2016	(2)		
Less: Interest payments, 2017	(2)		
Less Interest payments, thereafter	(12)		
Interest payments, total	(33)		

Here is one final example. Below you see four blocks: the first two are [Roll Forward]s, the third a [Roll Up], and the fourth a [Hierarchy]. The two [Roll Forward]s are connected to the [Roll Up], the ending balances of the [Roll Forward]s are the items which are being rolled up in the [Roll Up]. Because the information is represented correctly and because the rendering engine which produced the renderings from the machine-readable representation, the information is easy to understand.

In addition to the concept arrangement patterns which show the organization of the [Line Items] (which are in the rows on the left of the rendering), the information is further distinguished using the *Defined Benefit Plan Category [Axis]*.

A block is a combination of a *concept arrangement pattern* and *member arrangement patterns* which work together to distinguish reported facts.

Defined Benefit Plan Disclosure [Line Items]	Period [Axis]					
	2011-01-01 - 2011-12-31			2010-01-01 - 2010-12-31		
	Defined Benefit Plan Category [Axis]			Defined Benefit Plan Category [Axis]		
	U.S. Pension Benefits [Member]	Non-U.S. Pension Benefits [Member]	Other Postretirement Benefits [Member]	U.S. Pension Benefits [Member]	Non-U.S. Pension Benefits [Member]	Other Postretirement Benefits [Member]
Change in benefit obligation [Roll Forward]						
Benefit obligation at beginning of year	444,000,000	593,000,000	166,000,000	375,000,000	327,000,000	157,000,000
Service cost	38,000,000	9,000,000	8,000,000	32,000,000	8,000,000	10,000,000
Interest cost	21,000,000	33,000,000	8,000,000	22,000,000	26,000,000	9,000,000
Actuarial loss	43,000,000	25,000,000	28,000,000	31,000,000	4,000,000	10,000,000
Benefits paid	(19,000,000)	(16,000,000)	(14,000,000)	(47,000,000)	(12,000,000)	(15,000,000)
Curtailment	0	(4,000,000)	0	0	(1,000,000)	0
Acquisitions of businesses	0	2,000,000	0	34,000,000	253,000,000	27,000,000
Plan amendments	0	0	0	0	0	(32,000,000)
Other changes	(3,000,000)	1,000,000	0	(3,000,000)	2,000,000	0
Exchange rate adjustments	0	0	0	0	(14,000,000)	0
Benefit obligation at end of year	524,000,000	643,000,000	196,000,000	444,000,000	593,000,000	166,000,000
Change in plan assets [Roll Forward]						
Fair value of plan assets at beginning of year	416,000,000	474,000,000	0	346,000,000	248,000,000	0
Actual return on plan assets	(5,000,000)	38,000,000	0	48,000,000	36,000,000	0
Employer contributions	43,000,000	28,000,000	14,000,000	72,000,000	52,000,000	15,000,000
Acquisitions of businesses	0	0	0	0	160,000,000	0
Administration expenses	(2,000,000)	1,000,000	0	(3,000,000)	1,000,000	0
Exchange rate adjustments	0	1,000,000	0	0	(11,000,000)	0
Fair value of plan assets at end of year	433,000,000	526,000,000	0	416,000,000	474,000,000	0
Funding Status [Roll Up]						
Fair value of plan assets	433,000,000	526,000,000	0	416,000,000	474,000,000	0
Benefit obligation	524,000,000	643,000,000	196,000,000	444,000,000	593,000,000	166,000,000
Funded status - underfunded at end of year	(91,000,000)	(117,000,000)	(196,000,000)	(28,000,000)	(119,000,000)	(166,000,000)
Accumulated Benefit Obligation [Hierarchy]						
Accumulated benefit obligation	491,000,000	616,000,000	196,000,000	421,000,000	553,000,000	166,000,000

5.16. Summary of the complete representation model and mechanics

To tie all of the pieces together, we provide this summary of the representation model and an overview of the mechanical aspects of a financial report. The graphic below shows each of the implementation pieces which can be different depending upon how a software application exposes the pieces of a digital financial report to its business users. This is a summary of the pieces of a financial report.

- Report (Required)
  - Network (Required)
    - Table (Explicit or Implied) (Required)
      - Reporting Entity (Required)
      - Period (Member)
      - Units (Required for numeric facts)
      - Axis (Optional)
        - Whole-Part [Axis]
        - Is-A [Axis]
      - Line Items (Required)
        - Text Block
          - Level 1 Text Block (Note)
          - Level 2 Text Block (Policy)
          - Level 3 Text Block (Disclosure)
        - Level 4 Detail (Disclosure)
          - Hierarchy (Concepts related, but not mathmatically)
          - Roll Up (A + B + N = Total)
          - Roll Forward (Beginning Balance + Changes = Ending Balance)
          - Adjustment (Origionally Stated Balance + Adjustments = Restated Balance)
          - Roll Forward Info (Beginning Balance Info, Changes Info, Ending Balance Info)
          - Complex Compuation (Other specifically allowed mathmatical compuation pattern)
  - Fact

The table below summarizes the pieces that exist in the 10-K financial information of 6,674 public companies who report to the SEC using the XBRL format. The class of report piece, a count of the individuals in those reports, an average for many of the pieces and a brief comment is provided:

Class	**Count**	**Average per Report**	**Comment**
Report	6,674	1	Facts required to exist in Report
Network	477,041	71	Part of Component
Table	232,230	35	Part of Component
Axis	386,912	58	Part of Characteristic
Member	1,216,391	181	Part of Characteristic

Line Items	232,690	35	Type of [Axis], subclass of Characteristic
Abstract	732,409	111	No meaning, only used for organization
Concept	3,165,249	474	Part of Characteristic
Properties	Not counted		Each class has different but finite properties
Fact	8,532,275	1,278	Described by Characteristic, Required to exist within Network, Required to exist within explicit or implied Table
Text Block	398,492	59	Counted facts with data type of nonnum:textBlockItemType
Roll Forward	48,960		Counted preferred label roles which had start date and end date (approximate)
Roll Forward Info	18,794		Counted preferred label roles which had start date and end date but data type was not monetary (approximate)
Roll Up	114,584		Counted XBRL calculation relation roots
Hierarchy			Counted Networks with no matching XBRL calculation and no start date/end date preferred label role (work in progress)
Whole-part			Count specific [Axis] types (work in progress)
Is-a			Count specific [Axis] types (work in progress)

Taking this one step further, this provides lists of the next level of the digital financial report, the classes of text blocks, disclosures, characteristics, etc:

Class	**Comment**
Axis (need to break this out by whole-part and is-a type relations)	http://www.xbrlsite.com/2015/fro/us-gaap/html/Classes/Axes_Tree.html
Level 1 Note Level Text Blocks	http://www.xbrlsite.com/2015/fro/us-gaap/html/Classes/Level1TextBlock_Tree.html

Level 2 Policy Level Text Blocks	http://www.xbrlsite.com/2015/fro/us-gaap/html/Classes/Level2TextBlock_Tree.html
Level 3 Disclosure Level Text Blocks	http://www.xbrlsite.com/2015/fro/us-gaap/html/Classes/Level3TextBlock_Tree.html
Hierarchy	http://www.xbrlsite.com/LinkedData/Exemplars/Disclosures.aspx?InformationModel=[Hierarchy]
Roll Up	http://www.xbrlsite.com/LinkedData/Exemplars/Disclosures.aspx?InformationModel=[Roll Up]
Roll Forward	http://www.xbrlsite.com/LinkedData/Exemplars/Disclosures.aspx?InformationModel=[Roll Forward]
Report	http://www.sec.gov/Archives/edgar/monthly/xbrlrss-2014-12.xml

5.17. Expanding base mechanics, advanced mechanics articulated by the Financial Report Ontology

In order to explore the idea of consistent mechanics of a digital financial report, we used a base subset of the things and relations between things that one would find in a financial report. The purpose of using this base is to both reduce complexity of trying to explain these mechanics and to avoid debates by focusing on easy to distinguish things and relations and where high percentages of XBRL-based public company financial reports submitted to the SEC are consistent with those mechanics. If someone looks at the facts, these mechanical aspects are self-evident.

But these basic mechanical aspects of a financial report form only the base or foundation of a digital financial report.

The *Financial Report Ontology*[111] builds on that base.

The *Financial Report Ontology* is nothing more than a set of things and relations between things. It is basically a set of business rules which describe how a digital financial report works. The ontology is expressed in machine-readable terms.

Article 9 of *The Business Rules Manifesto*[112] states that business rules are: "Of, By, and For Business People, Not IT People". Article 9 further details what it means with the following three sub points:

- 9.1. Rules should arise from knowledgeable business people.
- 9.2. Business people should have tools available to help them formulate, validate, and manage rules.
- 9.3. Business people should have tools available to help them verify business rules against each other for consistency.

[111] Financial Report Ontology, http://xbrl.squarespace.com/financial-report-ontology/
[112] Business Rules Manifesto, http://www.businessrulesgroup.org/brmanifesto.htm

Business professionals understand their domains. Accounting professionals understand the domain of financial reporting. Business rules both *describe* the business domain rules, the semantics are IT professionals call them, of a business domain such as financial reporting and serve as the *quality control* mechanism that assures financial reports created are consistent with that description.

There is a direct relation between the description and quality control. In fact, description and quality control are two different sides of exactly the same coin. What we stated earlier in this document is worth repeating:

The only way a meaningful exchange of information can occur is the prior existence of agreed upon technical syntax rules, domain semantics rules, and workflow/process rules.

The *Financial Report Ontology* is simply additional helpful rules. The more business rules there are, the more software can do to help business and accounting professionals.

5.18. Final comments about basic mechanics of a financial report

We explained the mechanics of a digital financial report and showed that extremely high levels XBRL-based public company financial reports filed with the U.S. Securities and Exchange Commission are consistent with these mechanics. In fact, these mechanics were reverse-engineered from these XBRL-based financial reports.

We point out that these basic mechanics are finite and provide the necessary boundaries to allow for the system to be completely described by these basic mechanics using a fragment of first-order logic which is decidable.

By sticking to these basic mechanics digital financial reports can achieve the important criteria of being able to conclude if the mechanical aspects of the digital financial report are consistent with the description of the mechanics of a financial report or inconsistent. The reason that this is necessary is to be able to write software to assure that the mechanics of such digital financial reports are consistent.

Digital financial reports contain thousands and sometimes many thousands of individual pieces or structures. These structures, commonly formatted in machine-readable form using XBRL, are used to represent the information contained in the digital financial report. There are two distinct aspects of these pieces or structures that are important to recognize:

- **objective aspects** which are mechanical and do not require judgment and therefore can be managed using automated machine-based processes.
- **subjective aspects** which require the professional judgment of a skilled accountant, therefore they must be managed by humans.

These objective mechanical aspects are distinct from the subjective aspects which require professional judgment. The mechanical aspects relate to the things and relations between the things in a digital financial report. These mechanical aspects are governed by logic, common sense, and the rules of math. These mechanical aspects are what make up the structure of a financial report.

IT professionals creating software for business professionals need to be aware of the mechanical things and relations between things which make up a financial report in order to create software useful to business professionals. With useful software the

mechanical aspects can be handled by software freeing accounting professionals to use their skills in area which are impossible to automate, areas which require the professional judgment of a skilled human.

Is the purpose for each individual to dig their heels into the ground and insist that their arbitrary reality is the only reality? Or is the purpose to consciously create a coordinated, shared, commonly accepted, standard, useful view of reality to achieve a specific purpose: so that reality does appear to be objective and stable enough yet nuanced enough to be useful so that information can be used safely, reliably, predictably, repeatedly by both human and automated machine-based processes. The desired system state is one of balance or equilibrium; of consistency.

Prudence dictates that using financial information from a digital financial report not be a guessing game. It is only through conscious effort that the specific control mechanisms can be put in place to realize this intent.

It is only through deliberate conscious collaboration, cooperation and coordination by the participants of the financial reporting supply chain that that XBRL-based digital financial reporting will work safely, reliably, predictably, repeatedly, effectively, and efficiently. That is the goal.

Deliberate, methodical, conscious, and skillful execution using this approach can create digital financial reporting which is simple and elegant; and yet a sophisticated and powerful tool.

These general purpose financial reports will serve the needs of private entities creating financial reports under US GAAP. Public companies are covered in the next section.

6. Understanding Mechanics of an SEC-type XBRL-based Digital Financial Report

The purpose of this section is to summarize the mechanics of an SEC-style XBRL-based financial report created by public companies which submit their reports to the U.S. Securities and Exchange Commission (SEC).

6.1. Introduction

Section 6 of the SEC EDGAR Filer Manual[113] (EFM), the "Tagging Instructions" makes the following statement:

"This approach, though admittedly technical, is intended to provide information that is independent of the various commercially available software applications that filers may use to create their XBRL documents."

The EFM section on Interactive Data is written for a *technical audience*. This document is written for accounting professional or other business professionals who want to understand SEC-style digital financial reports.

This section builds on your understanding of knowledge engineering ideas, the basic mechanics of a digital financial report, and expands these ideas to include what is required to create an XBRL-based public company financial report which would be submitted to the SEC.

The vast majority of XBRL-based public company financial filings filed with the U.S. Securities and Exchange Commission are consistent with the mechanics and semantics described in this section. Some are not. The primary reason for inconsistency is the lack of rules that describe what such a report should look like when submitted to the SEC and also used to verify that a digital financial report is consistent with that description which would include these mechanics.

6.2. Summary of the Basic Mechanics of a Digital Financial Report

The following provides a summary overview of the foundational terminology used to describe machine-readable digital financial reports and the basic mechanics of such reports. Having a consistent understanding of these key terms is important for accounting professionals, information technology professionals, and knowledge management professionals to communicate effectively.

6.3. Foundational terms

We will use foundational terminology which is consistent with the state-of-the-art W3C vocabularies for describing the information of a problem domain or area of concern, the Semantic Web[114] terms which is covered in the section knowledge engineering for professional accountants and summarized here:

- **Thing**
- **Individual**

[113] EDGAR Filer Manual (Version 29), http://www.sec.gov/info/edgar/edgarfm-vol2-v29.pdf
[114] Semantic Web, http://www.w3.org/standards/semanticweb/

- **Class**
- **Property**
- **Relations between individuals**
- **Relations between classes**

6.4. Classes

As explained, a class is a set or category of individuals that have one or more distinguishing features in common which differentiates the class from other classes. The following are the classes of a digital financial report:

- **Economic entity**: Economic or accounting entity which creates a report.
- **Report**: A report is created by an economic entity. By report we mean digital financial report.
- **Component**: A report is made up of pieces. The pieces of a report are called a component. A component contains or groups a sets of facts. (Another term for component is Report Fragment[115].)
- **Characteristic**: Characteristics describe and distinguish facts contained within a component from other facts. (Another term for characteristic is Aspect[116].)
- **Fact**: A fact is reported and can be organized into components and described by characteristics. Another term for fact is Data Point.
- **Parenthetical explanation**: A parenthetical explanation provides additional descriptive information about a fact.
- **Block**: A block is a part[117] of a component; a component is made up of one to many blocks.
- **Part-whole[118] relation**: A whole-part relations is something composed exactly of their parts and nothing else or more where the parts add up to the whole.
- **Is-a relation**: An is-a relation describes some list but the list does not add up mathematically.
- **Has-property relation**:
- **Properties**: Each economic entity, report, component, characteristic, fact, block, and relation has a finite set of properties.

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[115] The US GAAP Taxonomy Architecture uses the term report fragment, http://xbrl.us/Documents/SECOFM-USGAAPT-Architecture-20080428.pdf

[116] The XBRL Abstract Model 2.0 uses the term Aspect, http://www.xbrl.org/Specification/abstractmodel-primary/PWD-2012-06-06/abstractmodel-primary-pwd-2012-06-06.html

[117] A block is a sub-set of a component. For example, the disclosure Funding Status of Defined Benefit Plans is made up of two roll forwards, a roll up, and a hierarchy each of which is a block of the component, see http://www.xbrlsite.com/2013/ReportingTemplates/2013-05-15/Library/730000-003-FundingStatusOfDefinedBenefitPlans/Template.jpg

[118] Toward Understanding Whole-Part Relations, http://xbrl.squarespace.com/journal/2015/1/20/toward-understanding-whole-part-relations.html

No new classes may be added. No properties may be added.

The salient classes of things that make up a financial report fall into that finite set of distinct and identifiable classes. Each of those classes has different but specific slots or openings into which things can be added.

6.5. Slots

As mentioned, a slot is simply the idea of an allotted place in an arrangement where something can be logically and sensibly placed.

For example, suppose you wanted to add something to a roll up of property, plant and equipment as shown below:

Property, Plant and Equipment, by Component [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Property, Plant and Equipment, by Component [Roll Up]		
Land	1,000,000	1,000,000
Machinery and equipment, gross	2,000,000	2,000,000
Furniture and fixtures, gross	6,000,000	6,000,000
Accumulated depreciation	(1,000,000)	(1,000,000)
Property, plant and equipment, net	8,000,000	8,000,000

Basically, it makes no sense to simply add information randomly or arbitrarily to the roll up. While every slot or opening where it makes sense to add information to the existing information above has not been pointed out, the set of examples provide should help you understand the notion of a slot.

6.6. Creating/adding subclasses or individuals into slots

You can never create a new class in the open system of a financial report. Creating new classes is not allowed. You can, however, create new classes in your own system which you understand and control and which you may explain to others and therefore make use of.

But you can add subclasses and individuals. These subclasses and individuals can only be added into specific allowed slots. This maintains system boundaries and the important feature of being able to determine if a financial report is consistent with the prescribed representation description.

As mentioned in the section *Understanding Basic Mechanics of a Digital Financial Report*, the following is a summary of subclasses and individuals which may be added to a digital financial report:

- Adding new economic/accounting entities
- Adding new report
- Adding a new characteristic
- Adding new concept characteristic
- Adding new disclosure (component or block)

- Adding facts
- Adding new parenthetical explanation to fact
- Adding new properties is not allowed

Different systems can have different rules for allowing new classes, subclasses, relations between classes, or properties. System boundaries can be extended by adding new relation patterns. New relation patterns must be consciously and formally added in a controlled and coordinated manner only by system implementers before any new pattern is allowed to be used. System boundaries can be extended by adding new classes or properties. New classes and new properties must be consciously and formally added in a controlled and coordinated manner only.

6.7. Patterns

The following types patterns exist in digital financial reports:

- **Concept arrangement pattern**
- **Member arrangement pattern**
- **Network arrangement pattern**

Only identified patterns are allowed. If a new pattern is identified, that pattern can be added. See the appendix *Understanding why adding new patterns is both rare and not a significant constraint* and *Understanding that patterns maintenance is an evolutionary process* and *Understanding that patterns are finite (i.e. not infinite)*.

6.8. Block

Because distinguishing a component and a block can be a little tricky, we wanted to provide some additional detail and examples which help make this idea more understandable. Consider the following financial report disclosure represented using XBRL:

Property, Plant and Equipment, by Component [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Property, Plant and Equipment, by Component [Roll Up]		
Land	1,000,000	1,000,000
Machinery and equipment, gross	2,000,000	2,000,000
Furniture and fixtures, gross	6,000,000	6,000,000
Accumulated depreciation	(1,000,000)	(1,000,000)
Property, plant and equipment, net	8,000,000	8,000,000

That disclosure is a roll up of the components that make up property, plant, and equipment, net. Basically there is a one-to-one correlation between the concept arrangement pattern (i.e. roll up) and the component.

Similarly, the following component contains one disclosure in one component:

Schedule of Accrued Liabilities [Line Items]	Period [Axis]		
	2013-01-01 - 2013-12-31	2012-01-01 - 2012-12-31	2011-01-01 - 2011-12-31
Balance at beginning of period	26,987,000	12,742,000	8,972,000
Acquisition			3,151,000
Deferral of new extended warranty revenue	20,191,000	22,344,000	8,659,000
Recognition of extended warranty deferred revenue	(12,789,000)	(8,099,000)	(8,040,000)
Balance at end of period	34,389,000	26,987,000	12,742,000

Again, there is a one-to-one correlation between the component and the concept arrangement pattern (i.e. this time a roll forward).

But now consider the component below. In that component you see one component but you see two concept arrangement patterns: a roll forward and then a roll up:

Restructuring Cost and Reserve [Line Items]	Period [Axis]					
	2010-01-01 - 2010-12-31			2009-01-01 - 2009-12-31		
	Restructuring Type [Axis]			Restructuring Type [Axis]		
	Facility Closing [Member]	Severance [Member]	All Restructuring Types [Domain]	Facility Closing [Member]	Severance [Member]	All Restructuring Types [Domain]
Restructuring Reserve [Roll Forward]						
Restructuring reserve, beginning balance	97,000,000	204,000,000	301,000,000	94,000,000	200,000,000	294,000,000
Restructuring charge	(1,000,000)	0	(1,000,000)	(4,000,000)	(4,000,000)	(8,000,000)
Cash payments	(4,000,000)	(4,000,000)	(8,000,000)	(6,000,000)	(6,000,000)	(12,000,000)
Accrual adjustment	0	(1,000,000)	(1,000,000)	(1,000,000)	0	(1,000,000)
Translation adjustment	30,000,000	5,000,000	35,000,000	14,000,000	14,000,000	28,000,000
Restructuring reserve, ending balance	122,000,000	204,000,000	326,000,000	97,000,000	204,000,000	301,000,000
Restructuring Reserve [Roll Up]						
Current portion of restructuring reserve	96,000,000	204,000,000	300,000,000	96,000,000	204,000,000	300,000,000
Long-term portion of restructuring reserve	26,000,000	0	26,000,000	1,000,000	0	1,000,000
Restructuring reserve	122,000,000	204,000,000	326,000,000	97,000,000	204,000,000	301,000,000

In order to maintain a one-to-one correlation between a piece of the report and the concept arrangement pattern used to represent the piece of the report, the notion of the *block* is used.

By thinking of the one component as two blocks, each with a one-to-one relation between the represented information and the concept arrangement pattern, software can help business professionals using and creating the information in many ways.

Accountants have the option of combining information in different ways when they want to present their disclosures. But they have far fewer options when it comes to representing the information in logical, sensible, and mathematically correct ways.

Not understanding the information makes it harder to create and harder to use the information.

6.9. Public Company Digital Financial Report Details

This section provides and overview of a financial report (report). A report is created by an economic entity. The report is created at some point in time (report creation date). The report is for a fiscal year, for a fiscal period, it has a current balance sheet date, it has a current year-to-date income statement period, the report has one or more report components, the report components contain facts which are reported. Some reported facts exist in more than one report component (i.e. intersections between report components).

6.9.1. Economic entity

An economic entity or accounting entity creates a financial report. An economic entity always has the following properties:

- Entity registrant name (dei:EntityRegistrantName)
- Entity central index key (CIK) (dei:EntityCentralIndexKey)
- Standard industry classification (SIC) (assigned by SEC EDGAR system)
- Current fiscal year end (dei:CurrentFiscalYearEndDate)
- Current reporting status (dei:EntityCurrentReportingStatus)
- Voluntary filer status (dei:EntityVoluntaryFilers)
- Entity filer category (dei:EntityFilerCategory)
- Well known seasoned issuer (dei:EntityWellKnownSeasonedIssuer)
- Public float (dei:EntityPublicFloat) (required for 10-K only)

Economic entities may have additional information, but every public company which submits a digital financial report to the SEC has the information above. The SIC is assigned to an entity but does not appear in the report itself. The public float fact is required only for 10-K report documents.

Economic entities may be broken down into smaller units which is discussed in a subsequent section of this document.

HINT: In an SEC XBRL-based financial report, the entity identifier of the context is identical for every context within the document. The entity identifier must be equal to the CIK number provided in the fact dei:EntityCentralIndexKey.

6.9.2. Report document

An economic entity creates a report. An economic entity can create one or many reports. This document covers only financial reports (financial information from a 10-K or 10-Q document). A report document always has the following properties:

- Document type (dei:DocumentType)
- Document period end date (dei:DocumentPeriodEndDate)
- Amendment flag (dei:AmendmentFlag)
- Report fiscal year focus (dei:DocumentFiscalYearFocus)
- Report fiscal period focus (dei:DocumentFiscalPeriodFocus)

6.9.3. Report creation date

Each report document has a creation date. The creation date is the acceptance date which is assigned when the report document is accepted by the EDGAR system. If a prior period adjustment is reported for an accounting error or change in accounting principle, then the *Report Date [Axis]* (us-gaap:CreationDateAxis) articulates the report creation date.

HINT: All reported facts have the same report creation date unless a prior period adjustment is reported using the Report Date [Axis] which indicates that some information in a prior report is being adjusted to be some new value.

6.9.4. Report periods (fiscal year, fiscal period, current balance sheet date, current income statement period)

Every report is for a fiscal year (e.g. 2013, 2014), is for some fiscal period of that fiscal year (e.g. Q1, Q2, Q3, FY).

Every report has a current balance sheet date. There are three places where the current balance sheet date is reported and all three must be consistent:

- The value of the reported fact with the concept dei:DocumentPeriodEndDate is the current balance sheet date.
- The value of the endDate context which is used on the reported fact with the concept dei:DocumentPeriodEndDate.
- The actual calendar period characteristic value which is used for the balance sheet concepts.

Note that all three of these occurrences of the current balance sheet date must be consistent.

Every report has a current year-to-date income statement period. The current balance sheet date is also the end date of the current year-to-date income statement period. There are two places where the start date of the current year-to-date income statement period must be consistent:

- The value of the startDate context which is used on the reported fact with the concept dei:DocumentPeriodEndDate.
- The actual calendar period characteristic value which is used for the income statement concepts.

Note that the current year-to-date cash flow statement period is the same as the current year-to-date income statement period.

6.10. Report components

A report is made up of report components. All reported facts are reported within one or more report components.

HINT: Reported facts are never "free-floating", they always exist within one or more report components. While it is the case that a fact can be used apart from the report component or components to which it is a member, it is the responsibility of the user of the fact to also bring the appropriate characteristics which describe that reported fact.

The following is a high-level overview of the sequence or ordering of report components within a report as prescribed by the SEC (see EFM section 6.7.12):

- **Report**
  - Document and Entity Information
    - Document information
    - Entity information
  - Statements
    - Statements
    - Statement related Parenthetical
  - Notes (Level 1Text Blocks)
    - Each Level 1 Text Block
  - Policies (Level 2 Text Blocks)
    - Each Level 2 Text Block
  - Disclosures (Level 3Text Blocks)
    - Each Level 3 Text Block
  - Disclosures (Detail)
    - Each Level 4 Detailed Disclosure

HINT: For some reason, the EFM example does not include document and entity information. Most public companies (virtually all really) provide this information in the first report component.

The statements of a financial report are consistently the following:

- Statement of financial position or balance sheet
  - Classified
  - Unclassified
  - Liquidation basis
- Statement of financial condition or income statement
- Statement of comprehensive income (may be combined with income statement)
- Statement of cash flows
- Statement of changes in equity

The disclosures of a company vary based on the transactions, events, and circumstances of the economic entity which is creating a financial report. However, every economic entity must disclose the following information:

- Nature of business/operations
- Basis of presentation/reporting
- Significant accounting policies

Economic entities might call these by slightly different terms but those three disclosures are essentially required in every financial report.

If certain line items show up on the primary financial statements, additional disclosures are expected to exist.

6.11. Intersections

A financial report contains facts, those facts are organized within components, and facts can exist within multiple components. For example, consider this balance sheet fragment and the related disclosure of property, plant, and equipment which shows one fact shown in two components:

Reporting Entity [Axis]	0000000001 (http://www.sec.gov/CIK)	
Legal Entity [Axis]	Consolidated Entity [Domain]	
	Period [Axis]	
Balance Sheet [Line Items]	2012-12-31	2011-12-31
Assets [Roll Up]		
Current assets [Roll Up]		
Cash, cash equivalents, and marketable securities [Roll Up]		
Cash and cash equivalents	11,000,000	10,000,000
Marketable securities	9,000,000	10,000,000
Cash, cash equivalents, and marketable securities	20,000,000	20,000,000
Accounts receivable, net of allowance for doubtful accounts of $1,000 and $1,000	29,000,000	29,000,000
Inventories	4,000,000	4,000,000
Prepaid expenses	3,000,000	3,000,000
Total current assets	56,000,000	56,000,000
Noncurrent assets [Roll Up]		
Property, plant and equipment, net	82,000,000	82,000,000
Deferred costs	9,000,000	9,000,000
Total noncurrent assets	91,000,000	91,000,000
Total assets	147,000,000	147,000,000
Liabilities and Equity [Roll Up]		
Current liabilities [Roll Up]		
Accounts payable	3,000,000	3,000,000
Accrued liabilities	4,000,000	4,000,000
Current portion of long-term debt	22,000,000	22,000,000
Product warranty accrual, current portion	26,000,000	26,000,000

Contrast the balance sheet to the disclosure below which shows the property, plant, and equipment breakdown:

Reporting Entity [Axis]		0000000001 (http://www.sec.gov/CIK)	
Legal Entity [Axis]		Consolidated Entity [Domain]	
		Period [Axis]	
Property, Plant and Equipment [Line Items]	Property, Plant and Equipment, Type [Axis]	2012-12-31	2011-12-31
Property, Plant and Equipment, Net, by Type [Roll Up]			
Property, plant and equipment, gross	Land [Member]	40,000,000	40,000,000
	Machinery and equipment [Member]	50,000,000	50,000,000
	Furniture and fixtures [Member]	7,000,000	7,000,000
	Property, Plant and Equipment, All Types [Domain]	97,000,000	97,000,000
Accumulated depreciation	Property, Plant and Equipment, All Types [Domain]	(15,000,000)	(15,000,000)
Property, plant, and equipment, net	Property, Plant and Equipment, All	82,000,000	82,000,000

The fact is the same. In both cases the fact is "property, plant, and equipment, net" which has the value 82,000,000. However the characteristics which describe the fact are different. On the balance sheet, there is no property, plant and equipment type [Axis], but in the disclosure there is. This is because the component which represents the disclosure needs to be able to differentiate the concepts.

It is challenging to show[119] the notion of an intersection and how useful it is in software applications without using software. This is best experienced to be fully appreciated.

HINT: A good way to view intersections is using the free Firefox XBRL plug-in[120] or the XBRL Cloud Viewer.

An intersection is where a fact in one component also exists in another component creating in essence a link between the two components, an intersection.

6.12. Reported facts

Finally we get to the essence of what a report does which is to report facts.

A fact is reported. A fact defines a single, observable, reportable piece of information contained within a financial report, or fact value, contextualized for unambiguous interpretation or analysis by one or more distinguishing characteristics. A fact value is one property of a fact. Every fact has exactly one fact value. The set of characteristics which describes the fact is also a property of the fact.

[119] This video walks you through the notion of an intersection, https://www.youtube.com/watch?v=INPjwKy2Obs

[120] To get the Firefox plug-in See http://xbrl.squarespace.com/journal/2010/10/29/game-changer-xbrl-viewer-add-on-for-firefox.html

Reporting entity	Legal entity	Period	Concept	Fact Value
ABC Company	Consolidated entity	January 1, 2011 to December 31, 2011	Revenues	2000
ABC Company	Consolidated entity	January 1, 2010 to December 31, 2010	Revenues	2500
ABC Company	Consolidated entity	January 1, 2009 to December 31, 2009	Revenues	2300
ABC Company	Consolidated entity	January 1, 2011 to December 31, 2011	Cost of revenues	1800
ABC Company	Consolidated entity	January 1, 2010 to December 31, 2010	Cost of revenues	1700
ABC Company	Consolidated entity	January 1, 2009 to December 31, 2009	Cost of revenues	1600
ABC Company	Consolidated entity	January 1, 2011 to December 31, 2011	Gross profit	200
ABC Company	Consolidated entity	January 1, 2010 to December 31, 2010	Gross profit	800

HINT: An all too common mistake which public companies make is that a fact is reported and it is represented with characteristics which have nothing to do with the reported fact.

6.13. Structural Pieces of a Digital Financial Report

The following structural pieces are used to organize the contents of a digital financial report. These structural pieces are used to represent the structure (model structure) of a digital financial report.

6.13.1. Networks

Networks have no specific semantics other than to separate a digital financial report into pieces. At times the pieces are desired. At other times the pieces are required in order to avoid conflicts in the relations between report elements.

While XBRL networks have one label (role definition), the SEC breaks that one label into three parts (EFM section 6.7.12): {SortCode} - {Type} - {Title}

- **SortCode**: Alphanumeric value which is used to sequence networks.
- **Type**: Describes the type of network and must be one of the following values: Document, Statement, Disclosure, Schedule
- **Title**: Describes what the network contains.

The following are the rules related to the ordering and content of networks which are contained in a report:

1. Document and entity information is generally the first network(s).
2. Each primary financial statement (and statement related parenthetical information immediately following the statement); the order of the statements must match human readable versions provided to the SEC.
3. Level 1 Text Blocks (note level text blocks) which contain information for each note follow immediately after each statement, one note per network.
4. Level 2 Text Blocks (policy level text blocks) must follow immediately after the note text blocks.
5. Level 3 Text Blocks (disclosures level text blocks) must follow immediately after the policy text blocks.

6. Level 4 Detail (disclosure detail level) must follow immediately after the disclosure level text blocks)

The following example is provided in the EFM (EFM section 6.7.12):

Example link:definition Text	Type of Facts in Presentation Links			
	Each Footnote as a Text Block	Each Accounting Policy as a Text Block	Each Table in a Footnote as a Text Block	Individual Values or Narratives
01 - Statement - Statement of Income				Yes
02 - Statement - Balance Sheet				Yes
03 - Statement - Balance Sheet (Parenthetical)				Yes
04 - Statement - Cash Flows				Yes
05 - Statement - Changes in Equity				Yes
06 - Statement - Comprehensive Income				Yes
07 - Disclosure - Accounting Policies	Yes			
08 - Disclosure - Inventories	Yes			
09 - Disclosure - Earnings per Share	Yes			
10 - Disclosure - Unearned Revenue	Yes			
11 - Disclosure - Equity	Yes			
12 - Disclosure - Accounting Policies, by Policy		Yes		
13 - Disclosure - Inventories (Tables)			Yes	
14 - Disclosure - Unearned Revenue (Tables)			Yes	
15 - Disclosure - Equity, Share Repurchases (Table)			Yes	
16 - Disclosure - Equity, Dividends (Table)			Yes	
17 - Disclosure - Inventories (Detail)				Yes
18 - Disclosure - Unearned, by Component (Detail)				Yes
19 - Disclosure - Unearned, by Segment (Detail)				Yes
20 - Disclosure - Equity, Share Repurchases (Detail)				Yes
21 - Disclosure - Equity, Dividends (Detail)				Yes

6.13.2. Report elements

The US GAAP Taxonomy Architecture[121] section 4.5 *Implementation of Tables* describes the relations between [Table], [Axis], [Member], [Line Items], Concept, and [Abstract] report elements.

Software was used to query the mechanical structure of 6,674 XBRL-based public company 10-K filings for primarily fiscal year 2013 and the following results were obtained:

[121] US GAAP Taxonomy Architecture, http://www.fasb.org/cs/ContentServer?c=Document_C&pagename=FASB%2FDocument_C%2FDocumentPage&cid=1176163689810

		Parent						
		Network 477,041	Table 232,230	Axis 386,912	Member 1,216,391	LineItems 232,690	Abstract 732,409	Concept 3,165,249
Child	Network	0	0	0	0	0	0	0
	Table	1,261	1	0	0	45	230,899	24
	Axis	1	386,888	0	0	3	20	0
	Member	3	0	450,091	766,221	4	72	0
	LineItems	183	232,181	0	0	107	217	2
	Abstract	474,310	22	0	1	113,059	144,471	546
	Concept	46	26	11	137	1,222,427	1,929,257	13,346

In the columns are the mechanical class of pieces which serve as the parent for some child mechanical class of piece: Network, Table, Axis, and so on. In the rows are the child mechinacal pieces: Network, Table, Axis, and so on. The cells show the number of relations which exist in the set of 6,674 digital financial reports.

This second graphic of the same information will better help you to interpret and understand the results:

		Parent						
		Network 477,041	Table 232,230	Axis 386,912	Member 1,216,391	LineItems 232,690	Abstract 732,409	Concept 3,165,249
Child	Network	0	0	0	0	0	0	0
	Table	1,261	1	0	0	45	230,899	24
	Axis	1	386,888	0	0	3	20	0
	Member	3	0	450,091	766,221	4	72	0
	LineItems	183	232,181	0	0	107	217	2
	Abstract	474,310	22	0	1	113,059	144,471	546
	Concept	46	26	11	137	1,222,427	1,929,257	13,346

What the graphic says about the reltionships between the structural pieces of the digital financial reports is the following:

- Of the 386,912 [Axis] which exist in the report, there are ZERO occasions where a parent [Axis] has a child [Axis].
- Of the 232,690 [Line Items] which exist in the report, there are 1,222,427 occasions where the parent [Line Items] has a child which is a Concept.

Without going into a lot of detail, the following graphic shows what the above graphic means: the allowed and disallowed relations between the mechanical building blocks: Network, Table, Axis, Member, LineItems, Abstract and Concept.

		Parent						
		Network	Table	Axis	Member	LineItems	Abstract	Concept
Child	Network	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL
	Table	OK	Disallowed	Disallowed	Disallowed	Disallowed	OK	Disallowed
	Axis	Disallowed	OK	Disallowed	Disallowed	Disallowed	Disallowed	Disallowed
	Member	Disallowed	Disallowed	OK	OK	Disallowed	Disallowed	Disallowed
	LineItems	Disallowed	OK	Disallowed	Disallowed	Disallowed	Disallowed	Disallowed
	Abstract	OK	Disallowed	Disallowed	Disallowed	OK	OK	Not advised
	Concept	Not advised	Disallowed	Disallowed	Disallowed	OK	OK	Not advised

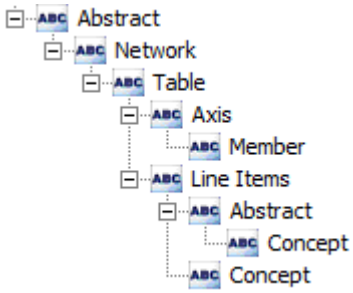
You need to reconcile the mechanical representation with an implementation of the mechanical representation in software[122]. While it is beyond the scope to do a detailed reconciliation between the semantics use in this document, the terms use by software and the US GAAP XBRL Taxonomy and SEC, and the XBRL technical syntax specification; it is necessary to provide an overview because we need to shift terminology slightly. This is that overview which reconciles terminology:

Term used in this document	**Term used by software**
Economic or accounting entity	Reporting Entity CIK (XBRL context entity identifier)
Report	XBRL instance document + XBRL taxonomy
Component	XBRL **Network** + [**Table**]
Characteristic (other than concept)	[**Axis**] + [**Member**]
Characteristic (concept)	[**Line Items**] + **Concept**
Fact	Fact
Block	Network + [**Table**] + Concept Arrangement Pattern
Relations pattern	Member arrangement pattern

That is a rough explanation of the terms we use to describe the mechanics of a financial report and terms use by software applications, SEC filings, and the US GAAP XBRL Taxonomy. A complete reconciliation of terminology is beyond the scope of this document and would cause more confusion and complexity that most business professionals would tolerate.

[122] Reconciliation of Financial Report Semantics and Dynamics Theory, to US GAAP XBRL Taxonomy Architecture and SEC implementation, to XBRL technical syntax, see http://www.xbrlsite.com/2012/Library/SemanticObjectlReconciliation.pdf

To keep this simple, the implementation of the mechanics can be distilled down to the following classes of report elements: Network, Table, Axis, Member, Line Items, Abstract and Concept. They are roughly related as follows:



The point here is not to have a debate about what should be allowed and what should not be allowed. While that debate and perhaps even a theoretical or philosophical discussion about the merits of allowing or disallowing relations could prove useful, that is not the point.

The point is this: First, if a profound majority of XBRL-based financial reports are represented in a certain way, it is very difficult to say that the approach is wrong. Not impossible because the majority could be incorrect in certain occasions.

But second, and most importantly, if rules can be created and enforced by software and it is possible to have 100% agreement then why is that not done?

Look at the graphic again. Notice that there are ZERO occasions where a Network is a child of any other mechanical structure. Why is that? The reason that there are ZERO is that the XBRL technical specification states that such relations are not allowed, and the XBRL consistency suite tests to make sure software does not make this mechanical mistake.

And so an obvious question is this: why are not other mechanical aspects not enforced in this manner?

6.13.3. Properties

The following is a summary of the relevant properties for each class of report element:

- Report
  - Collection of components
- Component
  - Collection of report elements
- Network
  - Name
  - Label (SortCode + Type + Title)
- Table
  - Name

    - Label
- Axis
    - Name
    - Label
- Member
    - Name
    - Label
- Line Items
    - Name
    - Label
- Abstract
    - Name
    - Label
- Concept
    - Name
    - Label
    - Data Type
    - Period Type
    - Balance Type
- Fact
    - Collection of characteristics
    - Fact value
    - Collection of parenthetical explanations
    - Units (numeric facts only)
    - Decimals (numeric facts only)

Note that while the XBRL technical syntax might require other properties (implemented as an attribute of an element), the properties are meaningless in terms of semantics. For example, a Table is required to have a data type of string, a period type of duration, and an abstract value of true; but that information is not relevant to the meaning of a Table.

While all report elements are required to have an ID attribute, that ID attribute is always identical to the namespace prefix plus "_" plus the name of the report element. Machines can automatically manage the ID.

6.13.4. Components and blocks

A component, referred to as a "report fragment" by the US GAAP Taxonomy Architecture and defined as "a portion of a financial report that includes one or more reported facts", is defined as follows

- **Component**: A component is a set of facts which go together (tend to be cohesive and share a certain common nature) for some specific purpose within a financial report. For example, a "balance sheet" is a component. "Maturities of long-term debt" is a component. A component can also be broken down into blocks.
- **Block**: A block is a set of facts within one component which are part of the same concept arrangement pattern.

A component contains one or more blocks. Each block has exactly one concept arrangement pattern, but shares the same member arrangement pattern as every other block.

A component is a combination of one network and one implied table or explicitly defined [Table].

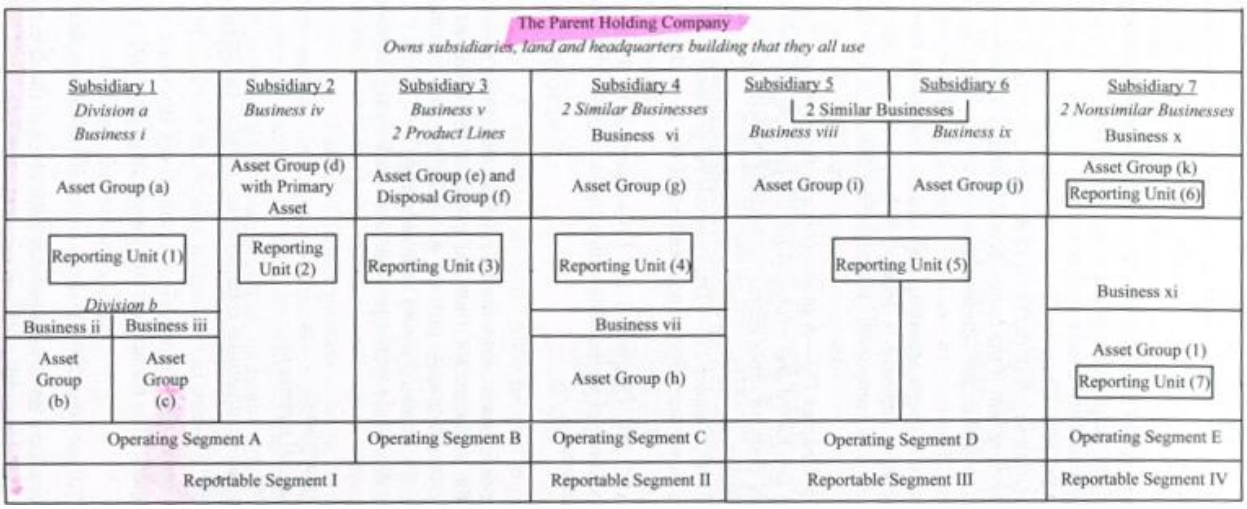
6.14. Relations between Structural Pieces of a Financial Report

Pieces of a report can be related to other pieces of a report. This is a summary of key relations.

6.14.1. Economic entity and parts of economic entity

An economic entity or accounting entity creates a financial report. That economic entity could be broken out into numerous different pieces of the economic entity. To use the information within a financial report, you need to discover the root economic entity. Software has to be able to identify that root economic entity. From that root economic entity, information about other parts of the economic entity can then be obtained.

To make this point clear we use the following example pointed out in the *Wiley GAAP 2011, Interpretations and Applications of Generally Accepted Accounting Principles*, Bragg, page 46:



6.14.2. Current balance sheet date and other balance sheet dates

Financial reports contain information for the current balance sheet date but also for prior balance sheet dates and perhaps balance sheets of some sub-part of the

economic entity reporting. Software analyzing a financial report must be able to discover the current balance sheet date.

From the current balance sheet date, other "as of" dates can be determined such as the prior period balance sheet information.

6.14.3. Current year-to-date income statement period and other periods

Financial reports contain information for the current year-to-date income statement period but also for prior income statements, other periods, and information for sub-parts of the economic entity. As such, software making use of a financial report needs to be able to discover the current year-to-date income statement period. That same period is used on the cash flow statement.

From the current year-to-date income statement period, other periods can be determined.

6.14.4. Primary financial statement line items and line item breakdowns

The primary financial statement line items tend to be a high-level summary of the information in a financial report. The primary financial statements can be seen as the first layer of a financial report.

The disclosures are used to break down the line items of a financial report into more detail. The breakdown could be a roll up of the components of some primary financial report line item or a roll forward of a line item.

Some disclosures do not physically tie to the primary financial statements. For example, information about subsequent events generally does not tie to the primary financial statements.

6.14.5. Fundamental accounting concepts and relations between concepts

Certain relations in a financial report never change. For example:

- Assets = Liabilities and Equity (the accounting equation)
- Assets = Current Assets + Noncurrent Assets (classified balance sheet only)
- Equity = Equity Attributable to Parent + Equity Attributable to Noncontrolling Interest
- Liabilities = Current Liabilities + Noncurrent Liabilities (classified balance sheet only)
- Liabilities and Equity = Liabilities + Temporary Equity + Equity
- Current Assets = Assets - Noncurrent Assets (classified balance sheet only)
- Current Liabilities = Liabilities - Noncurrent Liabilities (classified balance sheet only)
- Noncurrent Assets = Assets - Current Assets (classified balance sheet only)
- Noncurrent Liabilities = Liabilities - Current Liabilities (classified balance sheet only)
- Gross Profit = Revenues - Cost Of Revenue (Multi-step approach only)

- Operating Income (Loss) = Gross Profit - Operating Expenses + Other Operating Income (Multi-step approach only)
- Income (Loss) from Continuing Operations after Tax = Income (Loss) from Continuing Operations Before Tax - Income Tax Expense (Benefit)
- Net Income (Loss) = Income (Loss) from Continuing Operations After Tax + Income (Loss) from Discontinued Operations, Net of Tax + Extraordinary Items, Gain (Loss)
- Net Income (Loss) = Net Income (Loss) Attributable to Parent + Net Income (Loss) Attributable to Noncontrolling Interest
- Net Income (Loss) Available to Common Stockholders, Basic = Net Income (Loss) Attributable to Parent - Preferred Stock Dividends and Other Adjustments
- Comprehensive Income (Loss) = Comprehensive Income (Loss) Attributable to Parent + Comprehensive Income (Loss) Attributable to Noncontrolling Interest
- Comprehensive Income (Loss) = Net Income (Loss) + Other Comprehensive Income (Loss)
- Operating Income (Loss) = Revenues - Costs And Expenses + Other Operating Income (Single-step approach)
- Costs And Expenses = Cost Of Revenue + Operating Expenses (Single-step approach)
- Net Cash Flow = Net Cash Flows, Operating + Net Cash Flows, Investing + Net Cash Flows, Financing + Exchange Gains (Losses)
- Net Cash Flows, Continuing = Net Cash Flows, Operating, Continuing + Net Cash Flows, Investing, Continuing + Net Cash Flows, Financing, Continuing
- Net Cash Flows, Discontinued = Net Cash Flows, Operating, Discontinued + Net Cash Flows, Investing, Discontinued + Net Cash Flows, Financing, Discontinued
- Net Cash Flows, Operating = Net Cash Flows, Operating, Continuing + Net Cash Flows, Operating, Discontinued
- Net Cash Flows, Investing = Net Cash Flows, Investing, Continuing + Net Cash Flows, Investing, Discontinued
- Net Cash Flows, Financing = Net Cash Flows, Financing, Continuing + Net Cash Flows, Financing, Discontinued

Remember that the statement that these relations must be true have nothing to do with whether an economic entity is required to report a concept. For example, many economic entities do not report "Noncurrent assets". However, just because that line item is not explicitly reported does not invalidate the relationship. Noncurrent assets can be easily imputed by taking values which were reported. So, the value can be implied to be: Noncurrent assets = Assets – Current assets.

HINT: These relations truly never change. If it is the case that they do change, then a new reporting pallet or report frame is created. (See the section on report pallets.) The process of adding report pallets can continue until a set of relations exist which do not change.

6.15. Primary financial statement roll ups

Every balance sheet is a roll up of assets and of liabilities and equity; therefore every balance sheet should have business rules describing these relations. Every income statement is a roll up of net income (loss) and therefore every income statement should have business rules describing those relations. Every cash flow statement is a roll forward; that roll forward contains a roll up of net cash flow; and therefore every cash flow statement must provide business rules which describes those relations.

6.16. Reporting units

Every financial report has some base reporting units which it uses. For the vast majority of public company financial reports filed to the SEC those base reporting units are US Dollars. However, not all economic entities report using US Dollars. As such, the reporting units must be determined and it may even need to be discovered of more than one reporting units is used in the report.

6.17. Relations between text block, text blocks and detail

The SEC requires different levels of information to be reported using Level 1 Text Blocks (note level), Level 2 Text Blocks (policy level), Level 3 Text Blocks (disclosure level) and Level 4 Detail (disclosure level).

There are relations between text blocks and relations between text blocks and detailed information. The following is a summary of these relations:

- **Level 1 Text Blocks represent all notes**: Each note provided by a reporting entity is represented by one Level 1 Text Block.
- **Significant accounting policies**: One of the Level 1 Text Blocks contains the significant accounting policies of an economic entity. Those significant accounting policies are detailed in one set of Level 2 Text Blocks which represent the individual policies.
- **Level 3 Text Blocks provide details of specific Level 1 Text Blocks**: There is a relation between a Level 3 Text Block and a Level 1 Text Block. Said another way, some set of Level 3 Text Blocks go with some Level 1 Text Block.
- **Level 4 Detail relates to Level 3 Text Block**: Each Level 3 Text Block has one or more Level 4 Detail disclosures which provides equivalent information.

HINT: The SEC, for some reason, does not require text blocks for the primary financial statements or document and entity information. If they did, the 100% of the contents of a financial report would be provided in similar form to the HTML version of the financial report. As such, it would make a lot of sense to provide text blocks for the primary financial statements.

HINT: Software should be able to convert detailed disclosures into text blocks, eliminating the need to manually create text blocks.

6.18. Workflow and Process Related to Financial Reports

There is a workflow and/or process related to submitting, having the reports accepted by the EDGAR system, and so forth. We don't want to get into this workflow/process in detail. However, the following workflow or process related items are important to note.

6.18.1. Amended reports

An economic entity may submit a report to the SEC EDGAR system, have that report become available, and then amend the submitted report; replacing it with an amended report.

When an amended report is submitted, a different document type is used. Rather than 10-K, the document becomes a 10-K/A. Rather than a 10-Q, the document becomes a 10-Q/A. The amended flag value is switched from false to true. If the amended flag is true, indicating an amended report, an amendment description is provided.

When a report is amended, applications querying information should generally ignore the original submission and use the amended submission instead.

6.19. Consequences of Implementation Choices

The SEC made implementation choices when it implemented XBRL-based financial filings within its EDGAR system. Understanding the consequences of these choices helps business users better understand how the system operates.

6.19.1. Consequences of using non-unique and non-explicit tables

A consequence of non-unique and non-explicit tables being used is that in order to identify a component of a report you must use both the Network and [Table] (implied or explicit) in order to uniquely identify any component within an XBRL-based public company filing to the SEC.

Said another way, because the [Table] named *us-gaap:StatementTable* could be used to represent a balance sheet, and income statement, a cash flow statement, or literally any other component in an XBRL-based digital financial report; the name of the table is insufficient to uniquely identify report components.

For example, Microsoft uses *us-gaap:StatementTable* to represent their balance sheet, income statement, and cash flow statement (among other uses). As such, the network is necessary to differentiate the report components.

Network	Table
103 - Statement - INCOME STATEMENTS	us-gaap:StatementTable
106 - Statement - BALANCE SHEETS	us-gaap:StatementTable
108 - Statement - CASH FLOWS STATEMENTS	us-gaap:StatementTable

118 - Disclosure - GOODWILL	us-gaap:StatementTable

Contrast that to what this might look like if unique and explicit [Table]s were used:

Network	Table
103 - Statement - INCOME STATEMENTS	us-gaap:IncomeStatement
106 - Statement - BALANCE SHEETS	us-gaap:BalanceSheet
108 - Statement - CASH FLOWS STATEMENTS	us-gaap:CashFlowStatement
118 - Disclosure - GOODWILL	us-gaap:Goodwill

The [Table]s above are not in the US GAAP XBRL Taxonomy, rather they were created to make a point. Suppose those [Table]s did exist in the US GAAP XBRL Taxonomy and suppose that every public company used those concepts. Suppose an investor wanted to locate the balance sheet of every public company. The query would be as simple as looking for the [Table] *us-gaap:BalanceSheet*.

The balance sheet is only provided as an example. This situation exists for every disclosure of every financial report of every public company.

And so an alternative to the design choice of non-unique and non-explicit [Table]s would be to have unique and explicit [Table]s which would make querying information easier.

This is not to say that querying information is impossible. The current approach only makes things harder. It is still quite possible to query information using prototype theory[123].

6.19.2. Consequences of not employing explicit concept class relations

There are two salient consequences of not employing explicit concept class relations in public company XBRL-based financial reports to the SEC. The first consequence is that reporting entities can in essence use any concept in any way that it chooses without being aware that they have changed the explicit definition of a concept.

The second consequence is that because no mechanism exists to explicitly define class and subclass relations, when extension concepts are created by an economic entity there is no way for the entity to indicate what concept from the US GAAP XBRL Taxonomy they are extending.

Examples will make these consequences clear. The vast majority of reporting entities use the concept named *us-gaap:AssetsNoncurrent* to represent both what the name suggests and the document of the concept explicitly states: total noncurrent assets of a reporting entity. Yet a minority of reporting entities use that

[123] *Understanding Prototype Theory and How it Can be Useful in Analyzing and Creating SEC XBRL Filings*, http://www.xbrlsite.com/2013/Library/UnderstandingPrototypeTheory.pdf

concept to report what amounts to a line item which is included in *Other noncurrent assets*.

A second example is that economic entities generally use the concept *us-gaap:Revenue* or some fairly obvious subclass of *us-gaap:Revenue*, indicated by the XBRL calculation relations between revenues concepts provided in the US GAAP XBRL Taxonomy. Some economic entities do not find a concept in that list which satisfies their needs and they create some extension concept, for example *my:Revenues*. While humans may be able to deduce the fact that the extension concept articulates information about revenues, machine-based processes cannot reach that conclusion. However, if the reporting entity were required to state in essence "The extension concept which I created *my:Revenues* is a subclass of the concept *us-gaap:Revenue* but the definition is tweaked slightly to indicate that …" This mechanism already exists in XBRL[124].

6.19.3. Consequences of not requiring explicit business rules for roll forwards and member aggregations

One common mathematical relationship in public company XBRL-based financial filings is a roll up. Balance sheets are roll ups, as are income statements and cash flow statements have roll ups also. While most public companies provide the XBRL calculation relations required to represent and verify the consistency of these relations, a few do not.

Another common mathematical relation which also exists in public company XBRL-based financial filings are roll forwards. A roll forward reconciles a beginning balance to an ending balance by showing the changes between the beginning and ending balances. (e.g. Beginning balance + Additions – Subtractions = Ending balance) A cash flow statement, a statement of changes in equity, and a change in benefit obligation are all examples of roll forwards.

Not requiring public companies to articulate these roll forward relations has the consequence of allowing mathematical error in the digital financial reports of public companies.

Another common mathematical relation is many times referred to as a member aggregation. An example of a member aggregation is a breakdown of revenues by business segment or a breakdown of long-lived assets by geographic area. A member aggregation is very similar to a roll up but it aggregates values across some [Axis].

Neither a roll forward nor a member aggregation relationship can be represented using XBRL calculation relations. However, both of these types of mathematical relations can be represented using XBRL Formula.

A consequence of not requiring these relations to be represented by public companies providing XBRL-based financial reports to the SEC are data quality errors.

[124] Basically an XBRL definition linkbase relation is created between the extension concept and the existing US GAAP XBRL Taxonomy concept using the "essence-alias" (http://www.xbrl.org/2003/arcrole/essence-alias) relation.

7. Understanding Advanced Mechanics of a Financial Report

As we explained previously, **cognitive computing** is the simulation or mimicking of human thought processes in a computerized model. Cognitive computing will make semantic-oriented, model-based digital financial reporting work. Cognitive computing relies on a think metadata layer to help machines understand what you need the machine to do for you.

The only thing better than metadata is more metadata. That is what the advanced mechanics of a financial report is all about.

While not necessary for making use of digital financial reports, there are additional semantics which make working with such reports both easier and provides increases in functionality. This section covers this additional functionality.

Financial reporting and accounting ontologies

There are no official or formal ontologies which are being used for financial reporting yet. But there are some financial reporting and accounting ontologies being experimented with[125]. Here are a few that I have run across:

- **Accounting ontology**: To express the conceptual framework if IFRS.
- **Financial industry business ontology** (FIBO): Is an initiative by OMG to create an industry initiative to define financial industry terms, definitions and synonyms using semantic web principles.
- **Financial report ontology (prototype)**: This is an ontology which I created with metadata for financial reports and financial reporting.

7.1. Financial report ontology

The financial report ontology[126] extends the basic mechanics of a financial report and provides a set of additional semantics which makes working with financial reports easier and more functional. Some of the things included in the financial report ontology are:

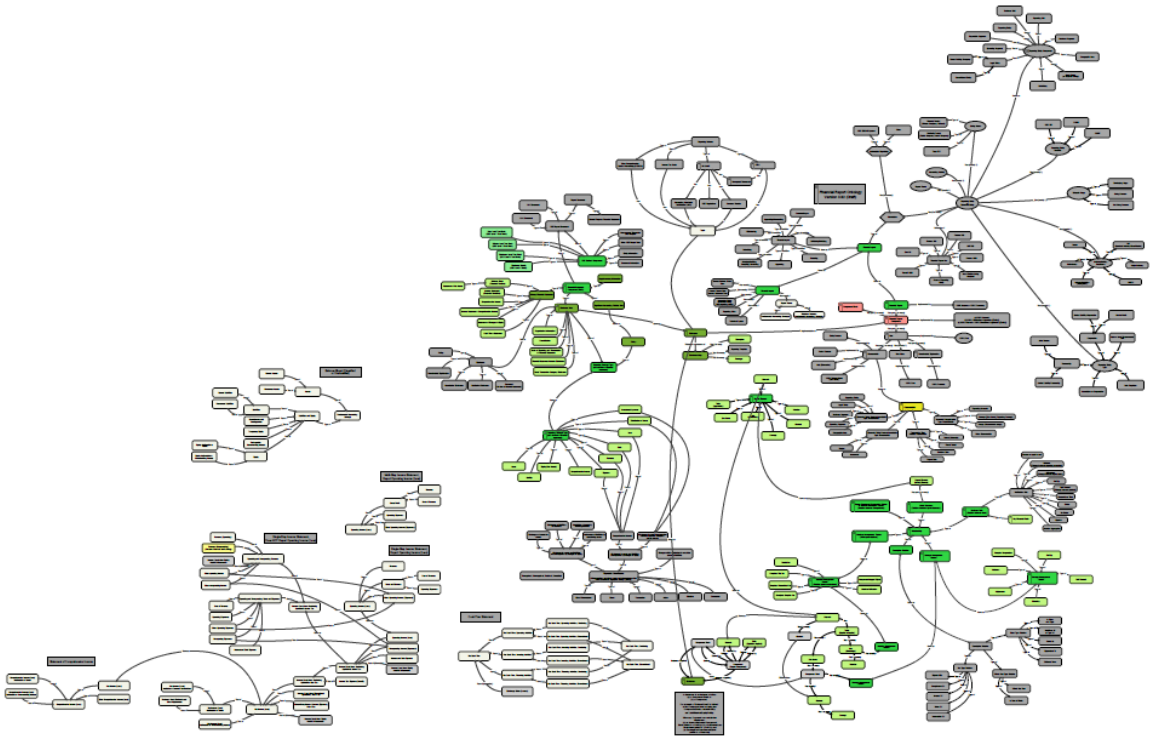
- **Disclosure**: A disclosure is a set of one or more blocks which together make up something that is disclosed within a financial report.
- **Topic**: A topic can be used to organize disclosures (disclosures can be organized by topic): Because there are so many different disclosures; the notion of a topic was created as a way to organize or categorize disclosures into sensible groups.
- **Exemplar**: An exemplar is a disclosure which has been made within some financial report which has been submitted to the SEC and serves as an example of what a disclosure might look like.

[125] See *Others use "Ontology" and "Accounting" or "Business" in Same Sentence*, http://xbrl.squarespace.com/journal/2015/4/4/others-use-ontology-and-accounting-or-business-in-same-sente.html

[126] Financial report ontology, http://xbrl.squarespace.com/financial-report-ontology/

- **Prototype**: A prototype describes a disclosure.

A good way to understand the things and relations between things in the financial report ontology is to view the things and their relations visually. Here is a visualization to give you an idea of what is included[127]:



Again, the financial report ontology is a working prototype which is being used to figure out what metadata needs to be created to provide the metadata needed by cognitive computing oriented applications to get computers to do work for professional accountants.

While these financial reporting related ontologies are still maturing, they can help you get an idea of where digital financial reporting is headed. We will leave it at this for now; however, this is the area which is the most interesting when it comes to digital financial reporting.

In the next chapter we will show how ontologies can be used to make US GAAP easier for humans to understand and advantages of making parts of US GAAP possible for machines to understand.

[127] Visual representation if the financial report ontology, http://www.xbrlsite.com/2015/fro/FinancialReportOntology-2015-01-19.pdf

8. Differentiating US GAAP Alternatives from US GAAP Ambiguity

Financial reporting needs clear, consistent, logically coherent, and unambiguous standards to support the creation of quality financial information in financial reports. This is contrast to financial reporting standards which might be vague, inconsistent, logically incoherent, and ambiguous.

Consistent and having allowed alternative and options are different situations which people commonly confuse.

In the financial reporting world we can live with clear, known alternatives or options. Professional accountants use their judgment to pick and choose amongst those known alternatives or options; applying what they consider the best alternative given all available alternatives or options. Exercising professional judgment is and should be part of financial reporting.

What financial reporting cannot live with are diverse interpretations which result in different results based on the exact same facts due to standard definitions and principles that are vague, inconsistent, logically incoherent, and ambiguous. A different understanding of the exact same facts is not judgement; it is lack of clarity, lack of consistency, lack of coherence, and ambiguity. You can have different interpretations of facts, that is judgment.

The vagueness, inconsistencies, logically incoherent, and ambiguities in the definitions and principles used in financial reporting standards are not alternatives or options; they are unintended errors in the standards.

Accounting professionals determine the difference between errors and differences in interpretation.

The FASB or IASB and others in the financial reporting supply chain aspire to create clear, consistent, logically coherent, and unambiguous definitions and principles which make up financial reporting standards. The definitions and principles are consciously, deliberately, methodically, and rigorously worked out specifications of the concepts and ideas which are used to express information in financial reports which are then used within the financial reporting supply chain. Vagueness, inconsistencies, incoherence, and ambiguities are minimized.

8.1. Role of ontologies in reducing ambiguity

When humans try and describe complicated things such as financial reporting standards in books it is easy to inadvertently make mistakes which contribute to vagueness, inconsistencies, incoherence, and ambiguities because the only way to check the meaning which is written is manually using humans.

However, when financial reporting standards are described using machine-readable formats[128] to express such information; then machines can be used to help humans check to make sure there is no vagueness, inconsistencies, logical incoherence, or ambiguities in the definitions and principles which make up the standards. Machines

[128] See the paper *An analysis of fundamental concepts in the conceptual framework using ontology technologies* which can be found here: http://xbrl.squarespace.com/journal/2015/4/19/accountants-understand-utility-of-ontology-for-reducing-ambi.html

will never be able to check everything, but there are certain things they can do better than humans.

The financial accounting conceptual framework created by the FASB contributes to this clear, consistent, logically coherent, and unambiguous terminology and principles by providing a disciplined framework[129] which can be used to think about financial accounting. A discussion of the framework in a FASB special report states in part:

- Providing a set of common premises as a basis for discussion
- Provide precise terminology
- Helping to ask the right questions
- Limiting areas of judgment and discretion and excluding from consideration potential solutions that are in conflict with it
- Imposing intellectual discipline on what traditionally has been a subjective and ad hoc reasoning process

However, given the idiosyncratic tendencies of humans, interpretations which reflect the arbitrary peculiarities of individuals can sometimes slip in or mistakes can be made when expressing such terminology. Further, parts of our understanding of financial reporting can be incorrect and can evolve and improve and may even simply change over time.

If different groups of professional accountants use different terminology for the same concepts and ideas to express the exact same truths about financial reporting; those professional accountants should be able to inquire as to why these arbitrary terms are used, identify the specific reasoning for this, and specifically identify concepts and ideas which are the exact same as other concepts and ideas but use different terminology or labels to describe what is in fact exactly the same thing; and to also understand the subtleties and nuances of concepts and ideas which are truly different from other concepts and ideas.

If idiosyncrasies result only in different terms and labels which are used to express the exact same concepts and ideas, then mappings can be created to point out these different terms used to express the same concepts and ideas. Such mappings make dialogue more intelligible and could get groups to accept a single standardized term or set of terminology for the purpose of interacting with common repositories of information, such as XBRL-based financial filings of public companies.

If the difference in terminology and expression are rooted in true and real theoretical differences between professional accountants, and the different terms express and point out important subtleties and nuances between what seemed to be the same terms; then these differences can be made explicit and discussed, in a rigorous and deliberate fashion within the accounting profession once the differences are made explicit.

While accumulating and articulating this information in the form of books and other human readable resources adds to the discipline and rigor of clearly, logically, coherently, unambiguously defining concepts and ideas; articulating this information in machine-readable fashion takes the discipline and rigor to an entirely new level.

[129] Per FASB Special Report, *The Framework of Financial Accounting Concepts and Standards* (1998)

Further, other new and interesting possibilities and flexibility are opened up because this information is expressed in machine-readable form.

And so while many professional accountants believe the purpose of the US GAAP XBRL Taxonomy is simply being something necessary for public companies to create and provide XBRL-based financial reports to the SEC; the reality is that it is much, much more than this.

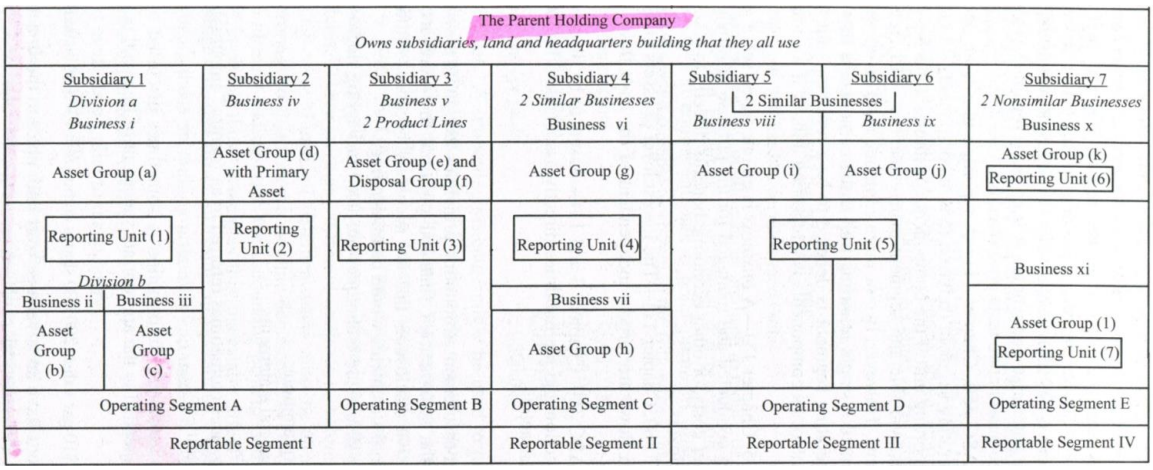
The US GAAP XBRL Taxonomy is a communications tool which will improve the clarity, logical coherence, consistency, reduce ambiguity, and improve overall quality of US GAAP based financial reporting for both public and private companies.

Below I provide three examples of vagueness, inconsistencies, logical incoherence, or ambiguousness observed in the financial reports of public companies which have been submitted to the SEC in digital form using the global standard XBRL. Because the financial reports are XBRL-based and therefore machine-readable 100% of the population of financial reports can be tested.

These three examples are intended to show the possibilities which are opened up because information is structured and therefore machine-readable.

8.2. Inconsistent financial position segmentation schemes

Wiley GAAP 2011 (page 46 to 48) points out inconsistencies in the financial position segmentation schemes used within the Accounting Standards Codification (ASC). Different schemes are required for various reporting purposes and depending upon specific circumstances. However, those different schemes use inconsistent and sometimes conflicting terminology. The *Wiley GAAP 2011* goes as far as providing a standard taxonomy which organizes and specifically describes these segmentations:



When trying to decipher the segmentation of entities in XBRL-based public company financial filings to the SEC it should be possible to locate the root economic entity[130] and then navigate down the hierarchy of segments. I have no data on whether it is or is not possible or to what extent the hierarchy can be navigated; however, for a small minority of public companies it is not even possible to identify the root

[130] The SEC refers to this as the entity of focus.

economic entity. Out of 6,751 entities analyzed[131], the root economic entity could be found for 6,720 or 99.5% but not for 31 public companies or .5%. The fact that 99.5% of root economic entities can be found is evidence that some scheme for discovering the starting point of entity segmentation is very possible. No attempt was made to analyze the next layer of segmentation because there is so much inconsistency between public company XBRL-based financial reports.

It would be very hard to get the XBRL-based information consistent given the inconsistency in US GAAP.

8.3. Variability in reporting Income (loss) from Equity Method Investments

Per an analysis of 9,679[132] public company XBRL-based financial filings to the SEC, 1,048 or about 11% of economic entities reported the line item *Income (loss) from equity method investments*. Of the 1,048 public companies which reported that line item; the following is a summary of where on the income statement the line item was reported:

- 624 entities (60%) reported the line item before tax directly as part of income (loss) from continuing operations before tax
- 128 entities (12%) reported the line item as part of nonoperating income (loss)
- 110 entities (10%) reported the line item after tax as part of special reporting items
- 20 entities (2%) reported the line item as part of revenues
- 22 entities (2%) reported the line item with income tax expense (benefit), between income (loss) from continuing operations before and after tax
- 10 entities (less than 1%) reported the line item as part of costs and expenses
- 8 entities (less than 1%) reported the line item as part of operating expenses
- 126 entities (12%) reported this information in some other manner which was not specifically identified.

As a professional accountant, I did not even realize that this sort of variability was allowed. Intuitively, I was surprised and found it hard to believe that this amount of variability was useful. Other accountants I spoke with were likewise surprised that income (loss) from equity method investments could be reported in so many locations on the income statement. I am not saying that any of these reporting entities did anything wrong. I am simply making an observation. Financial analysts I spoke with said this idiosyncrasy was one of the top 10 things that needed to be changed about financial reporting. These observations raise the following questions in my mind.

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[131] Understanding Public Company XBRL-based Financial Report Quality, see http://xbrl.squarespace.com/journal/2015/4/7/understanding-public-company-xbrl-based-financial-report-qua.html

[132] This analysis was done on 2013 information and can be found here, http://xbrl.squarespace.com/journal/2014/10/14/options-for-dealing-with-line-items-that-bounce-around-incom.html

- What is the purpose of this variability? Are there legitimate reasons why entities which use US GAAP have so much flexibility with this line item and not nearly the flexibility with other line items?
- Why exactly does this variability exist for this line item, but other line items do not have nearly so much variability? Are the accounting standards ambiguous? Was it a conscious choice to allow this level of variability, or was it caused by a sloppily written accounting standard?
- What would happen if someone like the SEC or FASB would say, "This line item always goes after tax with other special reporting items, similar to discontinued operations and extraordinary items." Could the FASB or SEC do this? Should the FASB or SEC do this? Would analysts be happy about this or would they not like this to be forced into one slot on the income statement?

I am not saying that I have appropriate answers to these questions. However, I do believe that these are reasonable questions.

8.4. Exchange gains (losses) in two locations in cash flow statement

An analysis of 6,751 entities showed that 2,169 or 32% reported the line item Exchange gains (losses) from foreign currency transactions on their cash flow statement[133]. Of those 2,169 entities; there were two approaches to reporting that line item:

- 2,068 or 95%: Beginning balance in cash + Net changes in cash = Ending balance in cash *(i.e. exchange gains are included within net change in cash)*
- 101 or 5%: Beginning balance in cash + Net changes in cash + Exchange gains (losses) from cash transactions = Ending balance in cash *(i.e. exchange gains are included in the roll forward between beginning and ending cash, not within net changes in cash)*

Originally, the US GAAP XBRL Taxonomy provided for only the first alternative which was used by the majority of public companies. Eventually, the US GAAP XBRL Taxonomy was modified to include both alternatives.

When talking with a number of other professional accountants, one indicated that the second alternative was a reporting error and the alternative used by the 95% of public companies was the only allowed alternative. Another accountant stated that there was nothing that prohibited the lesser used alternative.

These questions come to my mind about this situation:

- Are there really two (or maybe even more) ways of computing the value of the line item net change in cash?
- If alternatives exist, what is the specific reason for the alternative? What is the specific benefit that this variability provides?
- Would there be benefit to only having one alternative in order to improve financial report comparability?

[133] An earlier version of this analysis can be found here, http://xbrl.squarespace.com/journal/2009/11/24/issue-relating-to-effect-of-exchange-rate-on-cash-and-cash-e.html

Again, to be clear I am not saying that I know the answer to these questions or that any public company is doing anything incorrectly; rather am only raising the questions based on this observation.

8.5. Understanding Accounting Consistency and Comparability

The conceptual framework of the FASB uses the terms consistency and comparability in precise ways which may be different than how many people understand and define these terms.

Accounting *comparability* helps users of financial reports see similarities and differences between the reported transactions, events and circumstances when analysts try and compare information across entities. A part of accounting comparability is *consistency* of accounting practices across time periods which allows for the comparison across different periods for the same entity.

Entities must be consistent in applying their accounting policies to allow for comparability across time periods. For example, an entity cannot simply use the FIFO approach to valuing inventory in one period, change to LIFO in another period, and then back to FIFO. That is an inconsistent application of accounting policies.

While information across entities should be comparable that is not to mean that information is reported identically. For example, some entities report using a classified balance sheet, others use an unclassified balance sheet. Whether an entity uses a classified balance sheet or unclassified balance sheet has to do with industry accounting practices. A classified and unclassified balance sheet is not comparable at the level of current and noncurrent assets and liabilities because an unclassified balance sheet does not make that distinction. However, the balance sheets are comparable should you choose to compare them at the assets and liabilities and equity level. Likewise, a multi-step[134] income statement which reports gross profit is not directly comparable to a single-step income statement which does not report gross profit. However, there are levels of comparison which can be achieved and certain industry practices which, if followed, allow for more comparability.

Also, this is not to say that entities cannot change policies or other practices. They can. However, there are specified ways for doing so.

And so to be clear, there is no requirement that every line item of every financial report be directly comparable. It is very possible to compare entities which use different accounting practices and policies. Professional analysts understand how to perform appropriate comparisons. Having 100% consistency between entities is likewise not a requirement.

Stating that something is consistent with some description is different. Describing a financial report universally as having the relationship (business rules) "Assets = Liabilities and equity" and that a financial report is consistent with that description or rule is a different way to view consistency. This view is just as valid, just describing somethings slightly different.

Keeping these different definitions of consistency and comparability straight are important.

[134] To better understand comparability, see this information on report frames, http://www.xbrlsite.com/2015/fro/us-gaap/html/ReportFrames/

9. Understanding Fundamental Accounting Concepts and Report Frames

Economic entities report information in their financial reports. That information is not random. Relations exist between reported information. Some of those relations are universal to every economic entity that reports, such as the accounting equation. Other relations are universal to sets of entities that use a specific style of reporting. Whether economic entities explicitly report information or users of a financial report need to impute a fundamental accounting concept value, these universal relations are at play. These universal relations are both important to safely, reliably, and predictably using reported financial information and can be leveraged.

9.1. Interpreting fundamental accounting concepts

There are several moving pieces which relate to working with fundamental accounting concepts and relations between those concepts which must be understood. Not understanding these ideas can make it hard to interpret the dynamics of situations which are encountered[135].

9.1.1. Understanding the notion of category or class

When something is expressed in a taxonomy it is one specific category of thing. That one thing cannot be some other category of thing, something that it is not[136]. For example, *Assets* is something that is completely distinct from *Equity*.

One thing can be a sub-type of some other thing. For example, *Cash and cash equivalents* can be a sub-type of *Current asset*. By defining Cash and cash equivalents as a type of *Current asset*, you are implying that it is not a sub-type of *Equity*.

When some new thing is created, it needs to be created based on some other thing and not just placed into a taxonomy and not associated with anything at all. For example, when s public company creates an extension concept, that extension concept needs to be associated with something else for a machine-based process to understand what that extension means.

Public companies creating XBRL-based financial filings sometimes move a fundamental accounting concept to be part of some other fundamental accounting concept, "**crossing categories**", causing confusion when information is interpreted by users of the information. A common situation is where a public company moves the fundamental accounting concept "*Interest and Debt Expense*" to be included as part of the fundamental accounting concept "*Nonoperating Income (Expenses)*". Another common error is to report both a total and then a component of the total as siblings. For example, if a financial report provides a fact with the concept "*Preferred stock dividends and other adjustments*", and then outside that total it provides "*Preferred stock dividends*", machines trying to make use of this information stumble when attempting to interpret information.

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[135] See *Interpretation of Fundamental Accounting Concept Test Results*, http://www.xbrlsite.com/2014/Reference/InterpretationOfFundamentalAccountingConceptTestResults.pdf

[136] Some might argue that something can switch categories. If this is true, then exactly how to switch categories must be described.

Also, when an extension concept is created by a public company and no machine-readable information exists which relates an extension concept to some existing US GAAP XBRL Taxonomy concept or concept category, the machine using the information cannot possibly know the nature of the extension concept, the **extension concept is unknowable**. For example, if a filer reports the concept *my:SomeTypeOfOperatingExpense* and they intended that to be an operating expense, while a human can figure out the nature of the extension concept by reading the documention, but a machine cannot understand that the extension is an operating expense. However, if the public company created a machine-readable relation using the provided XBRL "general-special" relation, then computers attempting to make use of this information could decipher the nature of the extension concept.

While in many cases the intent of the reporting entity can be implied from perhaps roll up relations which have been expressed, in many other cases the intent cannot be interpreted. Neither the FASB nor SEC provide explicit guidance and therefore many different arbitrary interpretations could result. The best case scenario is for intent of reporting entities to be explicitly stated.

9.1.2.Imputed information as compared to explicitly reported information

If a reporting entity explicitly reports the concept *Noncurrent assets*, an analyst using a financial report can always be 100% sure of the value of *Noncurrent assets*. If, however, a reporting entity does not explicitly report the concept *Noncurrent assets*; but does report explicit values for *Current assets* and *Assets* (total assets), and the relation *Assets* = *Current assets* + *Noncurrent assets* is known to always be true, then an analyst can always safely and reliably use the rules of logic and math to imply or impute the value of *Noncurrent assets* using the know relation between *Assets*, *Current assets*, and *Noncurrent assets*.

Using explicitly reported information is always safer, but using the rules of logic and math to impute a value is likewise very safe if certain relations are always known to be true. With explicitly reported information you can also check relations in numerous ways in order to be ultra-sure that you are using the correct information, somewhat like a parity check. But parity checks are not as useful if information is imputed.

9.1.3.Mapping reported concepts

Sometimes, creators of a financial report have several different concepts which they might use to report what amounts to the same fact. For example, consider the concept *Equity*. The US GAAP XBRL Taxonomy provides numerous concept which could be used to report the fundamental accounting concept *Equity*:

Fundamental Concept Name	US GAAP XBRL Taxonomy Concept Name
fac:Equity	us-gaap:StockholdersEquityIncludingPortionAttributableToNoncontrollingInterest
fac:Equity	us-gaap:StockholdersEquity
fac:Equity	us-gaap:PartnersCapitalIncludingPortionAttributableToNoncontrollingInterest
fac:Equity	us-gaap:PartnersCapital
fac:Equity	us-gaap:CommonStockholdersEquity
fac:Equity	us-gaap:MembersEquity

Part of the reason multiple concepts exist has to do with inconsistencies in the US GAAP XBRL Taxonomy. One type of inconsistency is interpreting what is an entirely different concept and what is really only different labeling of what amounts to the same concept. For example, stockholders equity, partner capital, and member equity are all really one concept Equity with three different preferred labels for the concept.

Another reason different concepts are used is differences in interpretation of the meaning of certain line items. For example, if an economic entity reports *Equity attributable to parent*, *Equity attributable to noncontrolling interest*, and *Equity* (total equity); it is easy to sort out which concept is being used to report *Equity*. However, many times a reporting entity with report the line item labeled *Equity* and imply the meaning *Equity attributable to parent*; or report the line item labeled *Equity* and imply the meaning *Equity* (total equity). This can take some sorting out. As long as completely incorrect concepts are used, this can be sorted out by machines such as computers.

9.1.4. Coordination and cooperation important

There are exactly three possible reasons why a relation between the high-level fundamental accounting concepts expressed within XBRL-based public company financial reports do not conform to these fundamental accounting concept relations:

- **Reporting error**: The XBRL-based public company financial report to the SEC which reports some fact or facts does so incorrectly; a fact is wrong or a relation between facts is wrong or is interpreted differently than was anticipated for some reason. Basically, there is some inconsistency between the description of the information and what is reported.
- **Base taxonomy error**: The US GAAP XBRL Taxonomy expresses a concept which would be used to report a fact is unclear, inconsistent, logically inconsistent, or otherwise ambiguous and therefore there are different possible interpretations by those using that taxonomy or some important or common concept is missing altogether. Basically, there is some inconsistency between how reporting entities interpret the information description.
- **Software metadata or algorithm error**: The metadata used by the software algorithm to compute or otherwise interpret the fundamental accounting concepts or the relations between those concepts is in error or are interpreted differently by different software creators. Basically, software used to make use of fundamental accounting concept information is not consistent with the description provided by the US GAAP XBRL Taxonomy.

Coordination and cooperation in arriving at the description of concepts and relations between concepts is crucial. Idiosyncrasies in interpretations cause the system to not work as anticipated. Fundamental accounting concepts and relations between concepts is a control mechanism to help coordinate consistent understanding.

9.2. Overview of fundamental accounting concepts and report frames

In a financial report information is reported. For example, concepts such as *assets* and *liabilities and equity* are reported, among many others. There are relations

between reported concepts. For example, one of the most important relations is the accounting equation[137]: *assets = liabilities and equity*.

While the accounting equation and some other relations are true for all entities creating a financial report, other relations are unique to the industry accounting practices of specific industries and the economic entities in those industries. Other relations are applicable only if entities choose to use a specific alternative, for example reporting using a multi-step income statement as opposed to a single-step income statement.

9.3. Notion of fundamental accounting concepts

While not all financial reports have all facts in common, and different industries can have more or less in common, there are some core components which all accounting entities have. These facts can be thought of as "key stones" or "corner stones" which hold a financial report together or provide somewhat of a "skeleton" for a financial report. Note that this is not to say that all accounting entities report these accounting concepts; if a concept is not reported it can be logically imputed leveraging such known relations.

For example, these are fundamental accounting concepts which are common to most commercial and industrial reporting entities in all industries and relations which exist between these concepts which can never change:

- Assets = Liabilities and Equity
- Assets = Current Assets + Noncurrent Assets (classified balance sheet)
- Equity = Equity Attributable to Parent + Equity Attributable to Noncontrolling Interest
- Liabilities = Current Liabilities + Noncurrent Liabilities (classified balance sheet)
- Liabilities and Equity = Liabilities + Commitments and Contingencies + Temporary Equity + Equity
- Assets = Liabilities + Commitments and Contingencies + Temporary Equity + Equity
- Liabilities = Liabilities and Equity - (Commitments and Contingencies + Temporary Equity + Equity)
- Current Assets = Assets - Noncurrent Assets (classified balance sheet)
- Current Liabilities = Liabilities - Noncurrent Liabilities (classified balance sheet)
- Noncurrent Assets = Assets - Current Assets (classified balance sheet)
- Noncurrent Liabilities = Liabilities - Current Liabilities (classified balance sheet)
- Gross Profit = Revenues - Cost Of Revenue (Multi-step approach)
- Operating Income (Loss) = Gross Profit - Operating Expenses + Other Operating Income (Multi-step approach)

[137] The accounting equation, http://en.wikipedia.org/wiki/Accounting_equation; this rap song also helps you understand the accounting equation, https://www.youtube.com/watch?v=j71Kmxv7smk

- Income (Loss) from Continuing Operations Before Equity Method Investments = Operating Income (Loss) + Nonoperating Income (Loss) - Interest And Debt Expense
- Income (Loss) from Continuing Operations Before Tax = Income (Loss) from Continuing Operations Before Equity Method Investments + Income (Loss) from Equity Method Investments
- Income (Loss) from Continuing Operations after Tax = Income (Loss) from Continuing Operations Before Tax - Income Tax Expense (Benefit)
- Net Income (Loss) = Income (Loss) from Continuing Operations After Tax + Income (Loss) from Discontinued Operations, Net of Tax + Extraordinary Items, Gain (Loss)
- Net Income (Loss) = Net Income (Loss) Attributable to Parent + Net Income (Loss) Attributable to Noncontrolling Interest
- Net Income (Loss) Available to Common Stockholders, Basic = Net Income (Loss) Attributable to Parent - Preferred Stock Dividends and Other Adjustments
- Comprehensive Income (Loss) = Comprehensive Income (Loss) Attributable to Parent + Comprehensive Income (Loss) Attributable to Noncontrolling Interest
- Comprehensive Income (Loss) = Net Income (Loss) + Other Comprehensive Income (Loss)
- Operating Income (Loss) = Revenues - Costs And Expenses + Other Operating Income (Single-step approach)
- Costs And Expenses = Cost Of Revenue + Operating Expenses (Single-step approach)
- Net Cash Flow = Net Cash Flows, Operating + Net Cash Flows, Investing + Net Cash Flows, Financing + Exchange Gains (Losses)
- Net Cash Flows, Continuing = Net Cash Flows, Operating, Continuing + Net Cash Flows, Investing, Continuing + Net Cash Flows, Financing, Continuing
- Net Cash Flows, Discontinued = Net Cash Flows, Operating, Discontinued + Net Cash Flows, Investing, Discontinued + Net Cash Flows, Financing, Discontinued
- Net Cash Flows, Operating = Net Cash Flows, Operating, Continuing + Net Cash Flows, Operating, Discontinued
- Net Cash Flows, Investing = Net Cash Flows, Investing, Continuing + Net Cash Flows, Investing, Discontinued
- Net Cash Flows, Financing = Net Cash Flows, Financing, Continuing + Net Cash Flows, Financing, Discontinued

However, there is variability in how a handful of these fundamental accounting concepts are reported by economic entities. This brings us to the notion of report frames.

9.4. Notion of reporting pallets or report frames

Economic entities report using different reporting pallets or report frames. For example, consider the variability in where public companies report the line item *Income (Loss) from Equity Method Investments*[138]:

- 624 entities (60%) reported the line item before tax directly as part of income (loss) from continuing operations before tax
- 110 entities (10%) reported the line item after tax
- 128 entities (12%) reported the line item as part of nonoperating income (expense)
- 20 entities (2%) reported the line item as part of revenues
- 22 entities (2%) reported the line item between income (loss) from continuing operations before and after tax
- 10 entities (less than 1%) reported the line item as part of costs and expenses
- 8 entities (less than 1%) reported the line item as part of operating expenses
- 60 entities (6%) created an extension concept and the line item rolls up to that extension concept
- 66 entities (5%) did something else which was not directly analyzed so exact placement is unknown

Comprehensive testing of all SEC XBRL financial filings at this very high level revealed a very limited amount of variability most of which occurs on the income statement. This variability is not random. Most variability relates to the reporting practices of different industries which account for different activities. The following is a summary of and a complete inventory of this variability[139] at this high-level of a financial report:

- Entities report using some accounting industry or activity
    - Commercial and industrial (standard approach)
    - Interest based revenues
    - Insurance based revenues
    - Securities based revenues
    - REIT (real estate investment trust)
    - Utility
- Balance sheets can be
    - Classified and report current and noncurrent assets and liabilities

[138] See a detailed analysis of this topic here, http://xbrl.squarespace.com/journal/2014/10/14/options-for-dealing-with-line-items-that-bounce-around-incom.html

[139] This Excel spreadsheet is helpful in understanding reporting variability, http://xbrl.squarespace.com/journal/2014/9/15/wonderful-things-xbrl-based-structured-information-enables.html

    - Unclassified
    - Report using liquidity based reporting
- Income statements can be
    - Multi-step and report gross profit
    - Single-step and do not report gross profit
- Income statements can
    - Report operating income (loss)
    - Do not report operating income (loss)
- Income (loss) from equity method investments can be reported on the income statement
    - As part of revenues
    - As part of nonoperating income (loss)
    - Before taxes as a separate line item
    - After taxes as a separate line item
    - Between income (loss) from continuing operations before and after taxes
- Cash flow statements can report net cash flow as
    - Including exchange gains (losses)
    - Not including exchange gains (losses)

This is a comprehensive and complete inventory of the high level variability in public company financial filings. This information is not a statistical analysis or speculation. This is observable empirical evidence provided by the XBRL-based public company financial filings submitted to the SEC.

A coding scheme was developed to articulate this information in both human readable and machine readable form. Below is a brief description of that coding scheme. Each code has six parts: "COMID-BSC-CF1-ISS-IEMIB-OILY". This explains each part and the codes used for each part and shows the number of entities which have that characteristic (note that the totals add up to 6,943 and not 6,947; this relates to an issue with CIK numbers):

- **Part 1: Industry codes**: (Total 6,943)
    - COMID=Commercial and Industrial (5,985)
    - INTBX=Interest based revenues (632)
    - INSBX=Insurance based revenues (50)
    - SECBX=Securities based revenues (93)
    - REITX=Real estate investment trust (158)
    - UTILX=Utility (25)
- **Part 2: Balance sheet form codes**: (Total 6,943)

  - BSC=Classified balance sheet (5,527)
  - BSU=Unclassified balance sheet (1,412)
  - BSL=Liquidity based balance sheet (4)
- **Part 3: Cash flow statement exchange gains codes**: (Total 6,943)
  - CF1=Exchange gains (losses) part of net cash flow or does not report line item (6,845)
  - CF2=Exchange gains (losses) part of cash roll forward (98)
- **Part 4: Income statement form codes**: (Total 6,943)
  - ISS=Single step income statement (4,255)
  - ISM=Multi step income statement (2,688)
- **Part 5: Income (loss) from equity method investments location codes**: (Total 6,943)
  - IEMIX=Income (loss) from equity method investments not reported (5,290)
  - IEMIB=Income (loss) from equity method investments reported BEFORE tax (1,402)
  - IEBIA=Income (loss) from equity method investments reported AFTER tax (113)
  - IEMIN=Income (loss) from equity method investments reported within nonoperating income (loss) (122)
  - IEMIR=Income (loss) from equity method investments reported within revenues (16)
  - IEMIT=Income (loss) from equity method investments reported between income (loss) from continuing operations before and after taxes (0, not working yet)
- **Part 6: Operating income (loss) codes**: (Total 6,943)
  - OILY=Operating income (loss) reported (5,120)
  - OILN=Operating income (loss) not reported (1,823)

While the complete set of codes and report frames cannot be known until the process of breaking public company filings into these sets and testing each filing and set as to their conformance to the fundamental accounting concepts and relations within the set and the success of this process is verified by 100% conformance by each reporting entity to 100% of the fundamental accounting concepts and relations between those concepts within each set; this is achievable.

In fact, testing shows that this objective has already been achieved for 98.7% of relations and 60.0% of all public company financial reports submitted to the SEC using the XBRL format. Further, which reporting entities do not conform to these concepts and relations and why they do not conform is easy to observe.

Another possibility which exists in order to manage this process is simply to remove sets of reporting entities from scope. For example, I have already removed entities

which are funds and trusts from scope because I personally have no interest in such entities. Also, there are five entities which I classify as "hybrids" because they report using significantly more complex reporting schemes. Basically, certain report frames can be simply removed from scope.

10. Understanding Other Moving Parts of Digital

This section provides additional information foundational to understanding digital financial information. If the ideas in this section are not understood, then trying to understand why digital financial reporting will replace the current financial reporting paradigm is harder to understand. Also, if these ideas are not understood, information technology professionals could make poor architecture choices when implementing digital financial reporting in software products.

The following is a summary of ideas, concepts, and terminology you will need to understand in order to undertake the important journey of understanding model-based semantic-oriented XBRL-based digital financial reporting. This section is intended to help you fill in any gaps in understanding that you might have.

10.1. Understanding difference between simple and simplistic

Anyone can create something that is complex. But it is hard work to create something that is simple. As Steve Jobs put it, creating something that is simple and elegant to use is the ultimate sophistication[140].

> "It takes a lot of hard work," Jobs said, "to make something simple, to truly understand the underlying challenges and come up with elegant solutions." As the headline of Apple's first marketing brochure proclaimed in 1977, "Simplicity is the ultimate sophistication."

Simplistic is dumbing down a problem in order to make the problem easier to solve. Simplistic ignores complexity in order to solve a problem which can get you into trouble. Simplistic is over-simplifying. Simplistic means that you have a naïve understanding of the world, you don't understand the complexities of the world. Removing or forgetting complicated things does not allow for the creation of a real world solution that actually works.

Simple is something that is not complicated, that is easy to understand or do. Simple means without complications. An explanation of something can be consistent with the real world, consider all important subtleties and nuances, and still be simple, straight forward, and therefore easy to understand.

Complexity can never be removed from a system, but complexity can be moved. *The Law of Conservation of Complexity*[141] states:

> "Every application has an inherent amount of irreducible complexity. The only question is: Who will have to deal with it—the user, the application developer, or the platform developer?"

Another version of the law of conservation of complexity[142]:

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[140] How Steve Jobs' Love of Simplicity Fueled A Design Revolution, http://www.smithsonianmag.com/arts-culture/how-steve-jobs-love-of-simplicity-fueled-a-design-revolution-23868877/?no-ist

[141] The Law of Conservation of Complexity, http://www.nomodes.com/Larry_Tesler_Consulting/Complexity_Law.html

[142] Law of conservation of complexity, http://en.wikipedia.org/wiki/Law_of_conservation_of_complexity

> "Every application has an inherent amount of complexity that cannot be removed or hidden. Instead, it must be dealt with, either in product development or in user interaction."

Irreducible complexity[143] is explained as follows: A single system which is composed of several interacting parts that contribute to the basic function, and where the removal of any one of the parts causes the system to effectively cease functioning.

So for example, consider a simple mechanism such as a mousetrap. That mousetrap is composed of several different parts each of which is essential to the proper functioning of the mousetrap: a flat wooden base, a spring, a horizontal bar, a catch bar, the catch, and staples that hold the parts to the wooden base. If you have all the parts and the parts are assembled together properly, the mousetrap works as it was designed to work.

But say you remove one of the parts of the mousetrap. The mousetrap will no longer function as it was designed, it will not work. That is irreducible complexity: the complexity of the design requires that it can't be reduced any farther without losing functionality.

As pointed out in the document *Understanding Blocks, Slots, Templates, and Exemplars*[144], technical details can be hidden from business professionals using clever techniques. Coming up with the clever techniques can be a challenge. But the payoff is simplicity and elegance.

For example, the notion of a fact table explains the interaction between networks, hypercubes or [Table]s, dimensions or [Axis], [Member]s, primary items or [Line Items], and Concepts.

10.2. Interactive data

The SEC coined the term "interactive data". Most business professionals have used or at least seen a Microsoft Excel pivot table. A pivot table is interactive, or dynamic, in that information you are working with can be pivoted to display information in different configurations.

Just because a reporting entity provides information one way does not mean that you desire to make use of that information using that one presentation of the information. You may want to configure the information differently, you may want to do cross period comparisons of the information reported by an entity, or you may want to do cross reporting entity comparisons of information.

Imagine a financial report which is interactive or has the dynamic characteristics similar to an Excel pivot table. That is what a model-based digital financial report will be like. Digital financial reports can be made interactive, or dynamic, because of the nature of XBRL. You can jump from one place in a report to another because the report is really thousands of individual structures which are understood by software and the software can leverage that structure. You can reorganize the information to

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143 Irreducible complexity, http://en.wikipedia.org/wiki/Irreducible_complexity

144 *Understanding Blocks, Slots, Templates, and Exemplars*, http://xbrl.squarespace.com/journal/2015/5/11/understanding-blocks-slots-templates-and-exemplars.html

suit your preferences, desires, goals, and information needs. You can search, sort, filter, and reconfigure the financial report to suit your preferences.

How does this ability to reorganize a financial statement impact how a financial statement is, or should be, created and how does it impact how the reader of the financial statement interacts with the report? There is a connection between creation and use.

A model-based digital financial report or financial filing is much more like an Excel pivot table than a piece of paper or an electronic piece of paper such as PDF or HTML. As such, professional accountants creating such financial reports may need to look at what they are creating differently, adjusting for the characteristics of this new medium. With the positive characteristics offered by the structured nature of XBRL-based digital financial reports, potentially negative characteristics also show their face and if not properly managed can have undesired affects.

> HINT: Take a look at the video on this web page titled "Quantrix Key Concepts": http://goo.gl/qQ4Hx This video will help you understand the difference between logical models and semantic models.

10.3. Unstructured versus structured information

Simply put, digital information comes in three forms:

- **Unstructured** which means the information contains no identifiable structure and therefore it is unrecognizable and therefore not usable by computer software. Further, no controlled navigation within the pieces of the unstructured information is possible due it its lack of structure.
- **Structured** (or highly-structured) which means the information has identifiable structure which can be recognized and utilized by computer software. Further, because of the structure navigation within the pieces of structured information is possible because of the structure.
- **Semi-structured**[145] information is between structured and unstructured. Semi-structured information does not have sophisticated access structures but accessing information is possible[146].

Structuring information enables computer software applications to leverage that structure and work with the information. Unstructured information has not been organized into a format that makes it easy to access and process that information. Most information has some sort of basic structure.

Structured information, on the other hand, has be organized so that information can be addressed, accessed, and processed by machine-based processes such as computers.

Truth be known, everything that a computer works with has to be structured at some level and the level of structure determines what a computer can do with that digital information. The type of structure determines what you can, and cannot, do with that information.

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[145] See *Combining Unstructured, Fully Structured and Semi-Structured Information in Semantic Wikis*, http://goo.gl/TwUbs

[146] For more information about semi-structured information see this video, https://www.youtube.com/watch?v=5dk53PTK3g0#t=76

10.4. Approaches to structuring information

People tend to agree that there are three primary formats for representing/modeling highly structured and semi-structured information and that there are different types of databases or other approaches to storing this information:

- **Table-type format (homogeneous, tabular, consistent)**: relational databases, CSV, spreadsheets, or tabular-type representations which allow only one level of hierarchy within each table; but hierarchies can be constructed by relating tables
- **Tree-type format (heterogeneous, arborescent)**: XML, XBRL (using tuples), JSON and other tree-hierarchy-type information which allow for the expression of one hierarchy; hierarchical type databases, object type databases (Note that a tree is a special case of graph. See here to understand the difference)
- **Open-type or Graph-type format (heterogeneous, arborescent)**: RDF, EAV, XBRL (using dimensions) and other open schema-type or graph-type representations which are more graph-oriented or network-oriented (many-to-many) and allow for dynamically creating virtually any number of hierarchies; supports the notion of cycles; very flexible; network type databases; RDF triple stores.

People tend to agree that data formats are 100% interchangeable. A "tree" can be expressed in the form of a table and put into a relational database. A "graph" can be expressed in the form of a table and likewise be put into a relational database. A "table" can be expressed in the form of a tree or graph. These formats are syntax and any of these syntaxes can be used to store any type of information.

Now performance is important and different structuring formats have different pros and cons. Performance is created in any data format via the use of indexes. Relational databases have indexing capabilities, hierarchical databases have indexing capabilities, and network type databases have indexing capabilities.

People tend to agree that information is more interesting than data. It is not data that people are after; people are after information for the sake of knowledge. Relational databases are popular because of the 'relational' piece, not the 'data' piece. Relational databases are about, in part, organizing sets and relating one set with another set, getting the answers to questions back fast and easy across multiple sets. This is about using information with other information, comparing information. It is not about having a store of data. It is about making use of that data.

10.5. Structured for presentation versus structured for meaning

There are basically two manners or methods or protocols to structuring information digitally:

- **Structured for presentation**. An example of that is a Word processor document which is structured using headings, sub headings, paragraphs, tables and lists. An Excel spreadsheet is also an example of structuring for presentation, it uses worksheets, columns, rows, and cells. Or an HTML document is structured for presentation.
- **Structured for meaning**. An example of that is database or a taxonomy or other type of classification system. A database structures the presentation

into rows and columns, but the rows and columns are associated with defined names which are contained in the database schema which have specific meaning.

XBRL structures information for meaning. That structured meaning can be used to help a business user make use of that information.

10.6. Differentiating syntax and semantics

Often confused are the two parts of structured information. Both parts are important, but for different reasons:

- **Syntax** describes the form of the information and is generally not relevant to a business person. This is syntax: `<Name>John Doe</Name>`. Syntax is important to technical people.
- **Semantics** communicates the meaning of the information. For example, "the director's name is John Doe" communicates meaning as does "the balance sheet balances". Both are semantics of the information. Business meaning is key to the digital world.

Syntax can be thought of as "how you say something". Semantics can be thought of as "the meaning behind what you said." The following two videos explain and differentiate syntax and semantics:

How XBRL Works: http://www.youtube.com/watch?v=nATJBPOiTxM

This video about semantics: http://www.youtube.com/watch?v=OGg8A2zfWKg

Business professionals need to work with the meaning of information, not the syntax. Software applications build to interact with something like the XBRL technical syntax effectively force business professionals, if they want to user that software, to work with the XBRL technical syntax. If a higher level semantic model is employed to effective mask the technical syntax exposing business professionals to a higher level semantic model, complex things become easier for business professionals.

10.7. Interoperability

When trying to establish a formal system for exchanging information of any type, one needs to understand that there are three aspects to business system to business system interoperability (per this HL7 video)[147]:

- **Technical interoperability**: Physically moving information from business system "A" to business system "B".
- **Semantic interoperability**: Insuring that business system "A" and business system "B" understand the information in the same way.
- **Workflow interoperability**: Enabling business processes at the organization housing business system "A" to effectively work with business processes at the organization housing business system "B".

Achieving interoperability[148] will result in new cost effective, easy to use, robust, reliable, repeatable, predictable, scalable, secure, auditable, business information

[147] See HL7 video, http://www.hl7.org/documentcenter/public/training/IntroToHL7/player.html

[148] Understanding Interoperability, http://xbrl.squarespace.com/journal/2014/4/1/understanding-interoperability.html

exchange across business systems. Some business systems might be internal to your organization, others might be external to your organization.

People tend to agree that there are four things which make it possible for one system to interoperate with another system. Another way to look at it is HOW two systems CAN interoperate. The clarity of an interaction is determined by these four things[149]:

- Classification system used (business domain semantics)
- Power of the technical syntax to express information (business domain semantics)
- Business rules used to force information quality to be high (business domain semantics)
- Interoperability between systems (system, information syntax, information structure, domain semantics, process/workflow protocol)

10.8. Metadata

How you divide up your information does matter. Providing the proper "handles" or ways of accessing the components within a set of information is important.

In the digital world, metadata is important. You probably don't understand what metadata is but metadata is going to change your life, it already has. Metadata is simply data about data, it is used when computers communicate with one another. Metadata is one of the things which makes XBRL work. You need to understand how to make use of this metadata to express and control financial information.

Many people like to have debates about what is data and what is metadata but the debate is pointless. Just think of metadata as data at another level.

Another way to think about metadata is this: Metadata is good; more metadata is better; standard metadata is even better! Basically, the more that a computer understands something the more that the computer can do for you. Metadata helps computers understand how you want to work with your data.

The bottom line is this. Metadata is data and metadata is important.

The book *Everything is Miscellaneous* explains "the third order of order":

- **First order of order**. Putting books on shelves is an example the first order of order.
- **Second order of order**. Creating a list of books on the shelves you have is an example of second order of order. This can be done on paper or it can be done in a database.
- **Third order of order**. Adding even more information to information is an example of third order of order. Using the book example, classifying books by genre, best sellers, featured books, bargain books, books which one of your friends has read; basically there are countless ways to organize something.

[149] Attaining High Semantic Clarity and Smart Digital Financial Reporting Tools, http://xbrl.squarespace.com/journal/2014/4/2/attaining-high-semantic-clarity-and-smart-digital-financial.html

Third order removes the limitations which people seem to assume exist when it comes to organizing information. Weinberger (the author of *Everything is Miscellaneous*) says this about the third order of order:

> "In fact, the third-order practices that make a company's existing assets more profitable, increase customer loyalty, and seriously reduce costs are the Trojan horse of the information age. As we all get used to them, third-order practices undermine some of our most deeply ingrained ways of thinking about the world and our knowledge of it."

Metadata has strategic implications.

Financial reporting has boatloads and boatloads of metadata, far more metadata than is included in the US GAAP Taxonomy. The following wiki contains example metadata expressed using RDF/OWL which relates to financial reporting:

http://digitalfinancialreporting.wikispaces.com/home

http://www.xbrlsite.com/US-GAAP-2011/Exemplars/Viewer.html

One would think that the FASB and IASB could prove that their conceptual framework by articulating it using RDF/OWL, UML or some other modeling language. Certainly some of that could and should be done using XBRL. Also, because financial reporting is becoming so complex, using a modeling language can help improve communications.

The only thing better than metadata is more metadata. David Wenberger's book *Everything is Miscellaneous* points out two important things about classification systems:

- That every classification scheme ever devised inherently reflects the biases of those that constructed the classification system.
- The role metadata plays in allowing you to create your own custom classification system so you can have the view of something that you want.

As we move from "atoms" to "bits", people drag along the rules which apply to atoms and try to apply those rules to solve problems in the world of bits. This, of course, does not work. *Everything is Miscellaneous* has countless examples contrasting the physical organization of atoms (such as books in a book store) and the organization of books digitally (like Amazon.com).

What is the only thing better than metadata? More metadata. Metadata can take various forms such as business rules, for example:

- **Assertions**: For example asserting that the balance sheet balances or Assets = Liabilities + Equity.
- **Computations**: For example, calculating things, such as Total Property, Plant and Equipment = Land + Buildings + Fixtures + IT Equipment + Other Property, Plant, and Equipment.
- **Process-oriented rules**: For example, the disclosure checklist commonly used to create a financial statement which might have a rule, "If Property, Plant, and Equipment exists, then a Property, Plant and Equipment policies and disclosures must exist."
- **Regulations**: Another type of rule is a regulation which must be complied with, such as "The following is the set of ten things that must be reported if

you have Property, Plant and Equipment on your balance sheet: deprecation method by class, useful life by class, amount under capital leases by class . . ." and so on. Many people refer to these as reportability rules.

- **Instructions or documentation**: Rules can document relations or provide instructions, such as "Cash flow types must be either operating, financing, or investing.

10.9. Understanding "big data"

People tend to agree that the volume of information is growing rapidly. "Big data" is one of the new buzz words. Ask people what "big data" means and the average business professional probably could not tell you, but they will tell you that they need some because some software vendor says everyone needs big data! I have heard to good definitions of big data. The following are two good definitions that I have come across which explains what is meant by big data:

- Big data is data that is disparately located, varied in structure, voluminous in nature, and rapidly changing.
- Big data is data that is generated by machines. The data is "big" because the machines can generate the data faster than humans can consume the data. Humans really cannot create big data.

I would synthesize those two definitions and some other things that I know into the following explanation of what big data is:

BIG DATA is the notion that you no longer have the luxury of treating one database as 'the database' and putting all of the information you have into that one database. Data that you need exists within your organization and external to your organization. The data varies in the representation format (table, tree, graph). It varies by operating system (Windows, Mac, Linux, etc.). It varies by structure. The volume of information is high and it is getting higher. The velocity which data grows is increasing rapidly. Some of the information changes rapidly. Some of the data is generated by machines faster than humans can consume it. Welcome to the information age!

10.10. Information storage schemes

There are different ways to store information on a computer. You can store information in a file. Another alternative to storing information is to use a database. There are many types of databases. Another term for this is DBMS (database management system) or database model[150]. Now, keep in mind here that you have databases and you have modeling approaches used by databases. These are different things. For example, a relational database can use a multidimensional approach to representing information within that that relational database.

The following is a summary of database models:

- **RDBMS**: Relational database management system, which is a database based on the relational model or set theory. The relational model is a two

[150] Database model, http://en.wikipedia.org/wiki/Database_model

dimensional structure: rows and columns. (Note that you can use a multidimensional structure in a relational database.)

- **Hierarchical database**: A hierarchical database management system is a system which follows the hierarchical model[151].
- **Object database**: An object database is a database management system in which information is represented in the form of objects (follows object model), similar in approach to how objects are used in object-oriented programming.
- **Network database**: A network database is a database management system which follows the network model[152].
- **Multidimensional database**: A multidimensional database or multidimensional engine is a system which is fundamentally to work using the multidimensional model[153]. (i.e. this means it is not a relational database which is then structured to mimic the multidimensional model[154], it inherently uses the multidimensional model[155])
- **NoSQL database**: A NoSQL[156] (not only SQL) database provides a system which is based on an open data structure (e.g. tree, graph, key-value, document) which is generally something other than tabular. Basically, a NoSQL database is very flexible and you have to manage the structure yourself[157].
- **Triplestore**: A triplestore[158] or RDF triplestore is a purpose-built database for the storage and retrieval of triples, such as RDF, which is a graph of subject-predicate-object relations.
- **Flat file database**: A flat file database[159] is a system where in essence one or more files are used to store data.
- **Graph database**: A graph database[160] uses the mathematics notion of a graph or directed graph to implement a database model. Linked data is basically seeing the entire internet as a database. So the "system" is the internet itself.

Relational databases are popular information storage schemes and are very mature. NoSQL, network, graph, and RDF triplestores are gaining in popularity because they overcome many of the limitations of relational databases.

People tend to agree that relational databases are a very mature, tested, stable, well understood, popular, robust, sophisticated tools. There are a lot of people who

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[151] Hierarchical database model, http://en.wikipedia.org/wiki/Hierarchical_database_model
[152] Network model, http://en.wikipedia.org/wiki/Network_model
[153] Multidimensional database model, http://web.stanford.edu/dept/itss/docs/oracle/10g/olap.101/b10333/multimodel.htm
[154] Multidimensional or relational? What's the right system for you?, http://quartetfs.com/blog/multidimensional-or-relational-whats-the-right-system-for-you/
[155] The Rebirth Of Multidimensional Analytics, https://www.youtube.com/watch?v=AjrByTsbzdq
[156] NoSQL, http://en.wikipedia.org/wiki/NoSQL
[157] What is a NoSQL database?, https://www.youtube.com/watch?v=pHAItWE7QMU
[158] Triplestore, http://en.wikipedia.org/wiki/Triplestore
[159] Flat file database, http://en.wikipedia.org/wiki/Flat_file_database
[160] Graph, http://en.wikipedia.org/wiki/Graph_(abstract_data_type)

understand how to administer relational databases, develop relational databases, maintain relational databases, etc. There are a lot of incredibly useful features which relational databases have such as fault tolerance, commit-rollback, replication, etc. However, relational databases do have their weaknesses. No tool can do everything.

10.11. Information retrieval or query schemes

One you put information into a database of some sort, the next thing you want to do is get the information out of the database effectively and efficiently. There are many different information retrieval or query schemes or query languages[161]:

- **SQL**: Structured Query Language or SQL[162], a global standard query and functional programming language used by relational databases. SQL queries table-type data.
- **XQuery**: XQuery[163] is a global standard query and functional programming language that is designed to query and transform collections of structured and unstructured data, usually in the form of XML or text. XQuery queries tree-type data.
- **JSONiq**: JSONiq[164] is an open, third-party extension of XQuery which, among other things, expands XQuery to be used with JSON formatted information.
- **SPARQL**: SPARQL[165] Protocol and RDF Query Language is a global standard RDF query language, it is used to query graph-type or open-type data formatted in RDF.
- **MDX**: Multidimensional eXpressions or MDX[166], a query language for OLAP databases. This was first developed by Microsoft but it seems to be sort of a standard, it does seem to be popular.

People tend to agree that SQL is a fantastic query tool. Personally I love SQL. And, because we said above that any information can be expressed using any data format, clearly we can express any kind of information within a relational database. You can create foreign keys and relate any relational database table to any other relational database table. No problem there. Information technology professionals can do that for you or you can do that yourself.

However, the queries you have to create to get information out of that relational database get increasingly complex with more and more of these types of relations. Further, the database schema becomes increasingly hard to understand because how the information is structured is really not that intuitive.

Some people believe that you can convert SQL and SPARQL queries to XQuery[167]. I don't totally grasp this presentation. Theoretically, it makes sense that this is

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161 Query languages, http://en.wikipedia.org/wiki/Query_language
162 SQL, http://en.wikipedia.org/wiki/SQL
163 XQuery, http://en.wikipedia.org/wiki/XQuery
164 JSONiq, http://en.wikipedia.org/wiki/JSONiq
165 SPARQL, http://en.wikipedia.org/wiki/SPARQL
166 MDX, http://en.wikipedia.org/wiki/MultiDimensional_eXpressions
167 Translating SPARQL and SQL to XQuerySee, http://archive.xmlprague.cz/2011/presentations/sparql-sql-xquery.pdf

possible because information can be stored and transferred between any database format.

People don't tend to realize that trying to make a relational database do things that it was not really built do causes complexity which can make things harder to understand, harder to create, and harder to maintain. Basically, it is best to use the right tool for the right job.

10.12. Balancing a system, arriving at equilibrium

Life is a tradeoff. It is rare that something has only positive characteristics and something else has only negative characteristics. You get to choose a "basket" of characteristics. You pick the basket with the best set of characteristics which meets your needs and requirements. Maybe business professionals don't care about some characteristics of these things but someone who pays the bills cares about all of these. Business professionals need to understand their real needs and requirements so that the proper balance can be achieve. This decision process generally involves information technology professionals. Business professionals need to understand the tradeoffs so that proper discussions can take place between business professionals and information technology professionals. The correct equilibrium or balance must be achieved. All these need to be in balance:

- **Easy for business professional to use (intuitive)**: Something should be EASY to use as opposed to HARD to use.
- **Query power and query sophistication**: Queries should be POWERFUL rather than UNSOPHISTICATED. (The more you can do, the better, as long as what you can do is useful to you.)
- **Performance, query speed**: Performance should be FAST rather than SLOW.
- **Expressive power**: The expressiveness of the system should be EXPRESSIVE as compared to INEXPRESSIVE. (The more you can do, the better, as long as what you can do is useful to you.)
- **System flexibility, agility**: A system should be FLEXIBLE as compared to INFLEXIBLE. (Flexibility should be judged by where the user needs the flexibility. Flexibility in the wrong places causes a system to be harder to use than necessary. Unnecessary options are a bug, not a feature.)
- **System scalability**: A system might need to SCALE as compared to DOES NOT SCALE.
- **Global standard**: A system might be better if it is more STANDARD than PROPRIETARY.
- **Cost effective**: A system could either EXPENSIVE or INEXPENSIVE.
- **Maintainability**: A system could be either HARD TO MAINTAIN or EASY TO MAINTAIN.

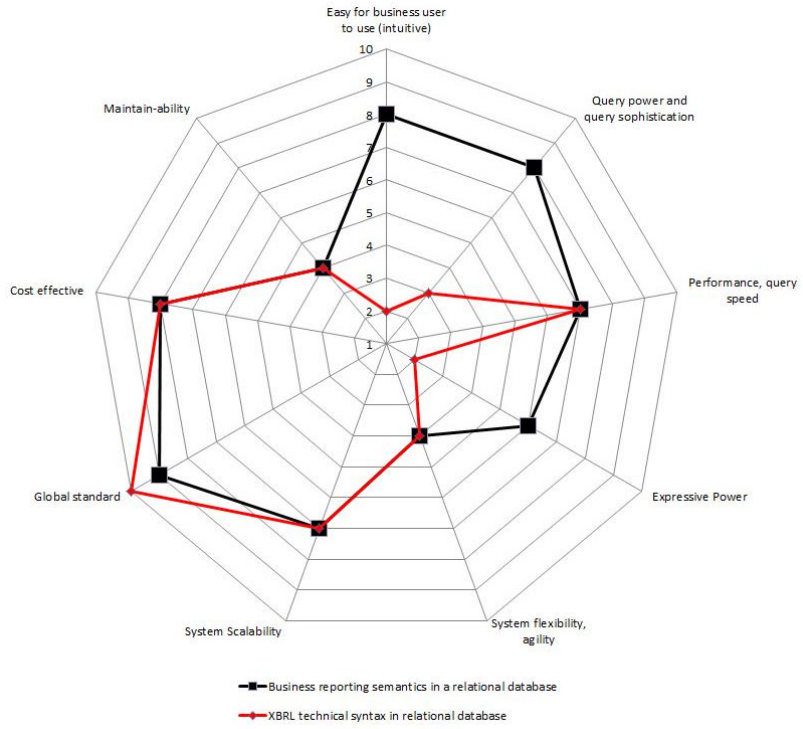
The following shows two radar charts which compare different implementation alternatives for storing XBRL-based information[168].

The first radar chart shows information related to storing the XBRL technical syntax in a relational database.

The second radar chart shows information related to storing not the XBRL technical syntax, but rather the meaning of information within a NoSQL database.

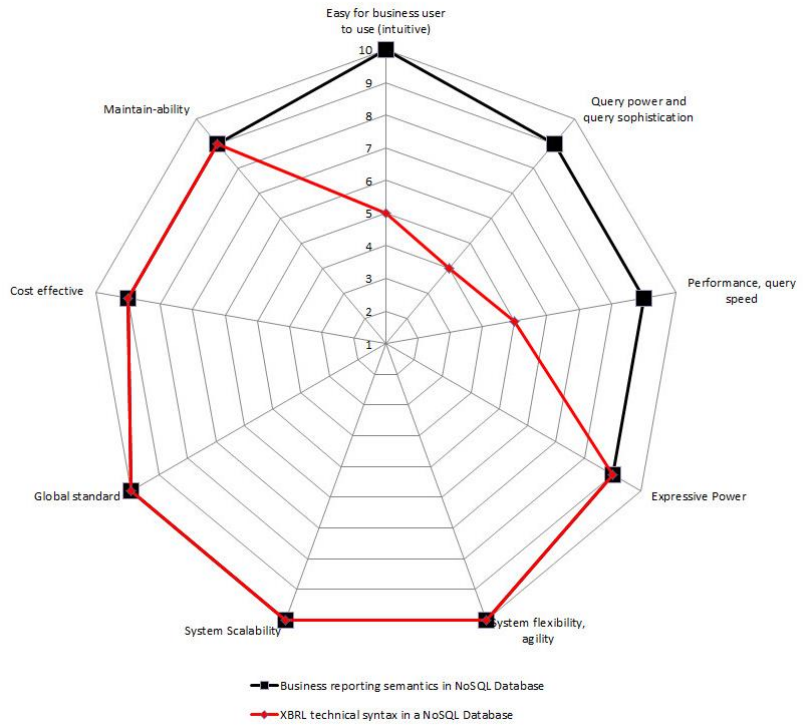
Data about the two implementation alternatives is not the focus here, rather the process of comparing different alternatives is the focus. Using testing and benchmarking anyone can accumulate their own information about alternatives which they see.

Comparison of requirements when XBRL technical syntax (red) and business report meaning (black) is stored in a relational database:



Comparison of requirements when XBRL technical syntax (red) and business report meaning (black) is stored in a NoSQL database:

[168] Comparing XBRL Implementation Alternatives, http://xbrl.squarespace.com/journal/2014/6/14/comparing-xbrl-implementation-alternatives.html



Business professionals need to understand certain aspects of how information technology works in order to make the best decisions and pick the best alternatives, all things considered. That is the point. The comparison above is our observations of the empirical evidence. Gather your own evidence.

As Nicholas Rescher puts it this way, "Knowing one's way about."[169]

> "...Knowledge brings great benefits. The release of ignorance is foremost among them. We have evolved within nature into the ecological niche of an intelligent being. In consequence, the need for understanding, for "knowing one's way about," is one of the most fundamental demands of the human condition."

10.13. Notion of logical or conceptual model

We have all worked with electronic spread sheets. They are easy to use because the software interface which you work with exposes you to familiar terms similar to paper spread sheets. Things like workbooks, worksheets, rows, columns, and cells are recognizable and organized into a logical or conceptual model which we understand.

XBRL is a technical syntax. The XBRL technical syntax is implemented by the US GAAP XBRL Taxonomy using a specific architecture or application profile. This application profile is laid out in the US GAAP Taxonomy Architecture. That architecture exposes a logical or conceptual model. You may not be able to see that

[169] Knowledge is justified true belief, http://xbrl.squarespace.com/journal/2013/11/17/knowledge-is-justified-true-belief.html

logical model because the US GAAP XBRL Taxonomy actually hides the model by being inconsistent. But the logical or conceptual model is there none-the-less.

10.14. Notion of semantic model

While logical models have their benefits, they still leave something missing: business meaning. Semantics is meaning as we pointed out above. Working with digital financial reports which relate to some specific business domain such as XBRL-based financial reports submitted to the SEC at the semantic level you deal with terms such as: balance sheet, income statement, assets, liabilities, equity, subsequent events, nonmonetary transactions, etc.

A semantic model provides an order of magnitude jump in usability over using a logical model. Eventually, this is how you will be working with XBRL; via a semantic model.

> HINT: Take a look at the video on this web page titled "The Basics of Quantrix Modeler": http://goo.gl/qQ4Hx This video will help you understand the difference between logical models and semantic models.

10.15. Business information is inherently dimensional

Business information, and particularly financial information, is inherently multidimensional. To understand what dimensional or multidimensional means and to understand why this is important, consider the following brief explanation:

- A **value** such as the numeric value for *pi* is a **scalar**. The value of *pi* which is 3.14 is the same, no matter where it is used. Scalars have no dimensions or other characteristics, they stand alone.
- A **list** can be thought of as having one dimension. Dimensions are a model for expressing characteristics of information. Dimensions effectively contextualized for unambiguous interpretation. For example, the name of a company and its state of incorporation can be thought of as a list.
- A **table** can be thought of as having two dimensions; one dimension represented by the columns of the table, the other by the rows of a table. Other terms used for table are matrix and array.
- A **cube** can be thought of as a three dimensional matrix/array. For example, think of the "x", the "y" and the "z" axis of a three dimensional chart you may have worked with.
- A **hypercube** is an "*n*-dimensional" matrix/array, meaning that it can have from one to any number of dimensions. Hypercubes can be hard to articulate in two dimensions, such as paper. But computers are good at working with hypercubes. You can think of a pivot table data as a hypercube.

The fundamental building block of the multidimensional model is the hypercube. A hypercube is a set of dimensions used to represent information.

Walking through this in another way, consider the number 1,000. What does that number mean? What if we told you that the number related to Cash and Cash Equivalents for the current fiscal period of December 31, 2010, reported by the consolidated entity which has the SEC CIK number 0123456789 whose value is $1,000,000 reported in thousands of US Dollars. Each of those descriptive characteristics of the number 1,000 is a different dimension of that number.

In order for financial information to be usable the information must be unambiguous to be interpreted appropriately.

The multidimensional model is simply a logical model for organizing information. The multidimensional model is flexible in that it does not specify presentation information related to the information expressed by the model. Presentation of that information is a different problem than unambiguously expressing the information. Users of the model are free to present the information as they deem appropriate, leveraging the dimensional information or other helpful information. What the multidimensional model does provide is enough agreement to express information so that it can be unambiguously understood by a computer software application, including applications which can render the financial information in a format appropriate for human consumption.

10.16. Role of software

Complexity can never be removed from a process but it can be moved. Software can assume the complexity of things like the XBRL technical syntax by leveraging things like a logical model or a semantic model. Software can leverage ideas such as the multidimensional model in pursuit of that task.

Software can turn the complex physical implementation of technology into a significantly easier to use logical model and/or semantic model; hiding and taking care of the complexity of the technology for the user in the background. Most software today which tries to help business professionals make us of XBRL is still maturing and does not leverage a logical model or semantic model; therefore they have to work at the level of the XBRL technical syntax. Software will mature and move to a more semantic approach, hiding the technical syntax from business professionals.

10.17. Semantic, structured authoring

The benefits of a model-based, digital, semantic, structured authoring approach over the unstructured approach used today to create financial reports such as financial statements, such as packing financial information into Microsoft Word which understands nothing about financial reporting, seem quite clear and obvious; if you understand the technologies employed to achieve the goal.

Even if you are not required to create your financial reports or financial reports using this type of an approach by a regulator or someone else, a semantic, structure authoring is beneficial. Model-based digital financial reporting is a semantic, structured authoring approach.

Structured authoring of documents has been around for quite a long time. Pharmaceutical companies and airplane manufactures have used the structured general mark-up language (SGML) for quite some time. The appearance of XML based authoring tools made structured authoring even more used. Structured authoring is maturing, becoming more cost effective for smaller companies, and becoming more broadly used.

There are others taking a structured authoring approach to creating financial statements. SAP, Oracle, and IBM to name three. All of these companies are working to change the "last mile of finance" as are others. Many of these companies started down this path long before XBRL even existed. Disclosure management software is replacing Microsoft Word for creating financial reports.

There are lots of different terms for structured authoring: model based reporting, digital financial reporting, 21st Century financial reporting.

Semantic, structured authoring is defined:

> "to compose information content semantically structured according to some ontology"

The paper *Semantic Authoring and Learning Thereof*[170] by Kôiti Hasida talks about semantic structured authoring in more detail. It points out how this approach can be more productive and improve quality.

Semantic structured authoring is a marriage between ideas of structured authoring and ideas of the semantic web. Add to this business intelligence, then you see financial reports such as financial statements and financial reporting practiced in new ways.

[170] See, http://dblp.uni-trier.de/pers/hd/h/Hasida:K=ocirc=iti

10.18. Understanding the multidimensional model

The multidimensional model is a model used to represent information. Other popular models for representing information include the relational model and hierarchical model. There are other models. Each models has its strengths and weaknesses, it pros and cons.

Multidimensional views of information provide what many people refer to as the ability to "slice and dice" information. Another way of stating this is that the multidimensional model provides flexible access to information.

People often confuse the multidimensional model with OLAP (online analytical processing), BI (business intelligence) and other such implementations of the multidimensional model.

Transaction processing systems such as accounting systems tend to use the relational model or a relational database management system (RDBMS).

Data warehouses or sometimes called data marts is an approach to creating an enterprise wide data store. A data warehouse basically helps tie transaction processing systems together so the data can be access as if it were one set. Business intelligence systems are used to report information to those who use that information. But data warehouses and business intelligence software tends to be focused on the internal use of information within one organization. Much information which one might use can be external to an organization.

As we said, each of these models has its pros (strengths) and cons (weaknesses); each has different needs. Business information comes from these different systems and goes into these different systems.

Yet there is no one standard multidimensional model used by all systems which use that model. The relational model has SQL (structured query language) and ODBC (open database connectivity). Connecting systems which use the multidimensional model can be more challenging. The white paper *Getting Started with ADAPT™, OLAP Database Design*[171] discusses these issues.

This section helps sheds light on why the multidimensional model is used, it separates the multidimensional model, OLAP, BI, and XBRL Dimensions.

10.18.1. Strength of the multidimensional model

The greatest strength of the multidimensional model is the flexibility it provides to slice and dice and otherwise reformat information to fit the preference of the consumer of the information. Relational databases can be made to express information using a multidimensional type of an approach using fact tables, star schemas to mimic the multidimensional model, but a multidimensional database is optimized for the multidimensional model.

10.18.2. Strength of the OLAP

OLAP (On-Line Analytical Processing[172]) is an approach to swiftly answer a query.

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[171] Getting Started with ADAPT™, OLAP Database Design, http://www.symcorp.com/downloads/ADAPT_white_paper.pdf

[172] OLAP Council Whitepaper, http://www.olapcouncil.org/research/whtpaply.htm

OLAP and the multidimensional model are two different things. OLAP uses the multidimensional model to achieve its goals. OLAP tends to focus on numbers only, is optimized to enable the aggregation of information. Also, OLAP sometimes even pre-aggregates numbers to make queries faster. Further, OLAP is for providing information, it is not generally "read-write". OLAP tends to be less useful with reporting textual type information and in situations where you do not want aggregation.

OLAP tends to be internally focused within an entity and not that adept at working with information which is external to an entity.

You can think of OLAP as if it were a three dimensional spreadsheet (or more precisely an *"N"* dimensional spreadsheet meaning any number of dimensions). This is called an OLAP cube. An Excel pivot table is a very basic example of an OLAP cube[173].

10.18.3. Business intelligence systems

Business intelligence[174] (BI) is a type of decision support system which transforms and organized raw information and transforms that information so that it can be used to make business decisions. BI systems are organized to present information in such a way as to guide a business toward some desired goal.

BI systems tend to use OLAP and therefore likewise tend to use the multidimensional model. BI systems are implemented within software.

BI systems have pros and cons:

- There is no one global standard BI system or one standard multidimensional model used by BI systems. As such, BI systems are not generally interoperable. They can be made to interoperate, but they are not inherently interoperable. BI systems tend to work well with the internal information of an enterprise, but less well with information external to an enterprise.
- BI systems generally use OLAP. And as such they have the strengths and limitations of OLAP. As such, BI systems tend to work best with numbers and tend to force you to aggregate numbers.
- BI systems tend to be read only, you can use information from a BI system but you cannot put information into a BI system. Generally, BI information is put into a transaction processing system which then goes into a data warehouse which the BI system then uses.
- BI systems focus on numbers and work with numbers extremely well; however they work less well with textual type information or narratives.
- BI systems don't tend to allow you to import schemas or other metadata which is used to work with the information, the tools tend to provide you mechanisms within the tools to create this metadata.

Two of these limitations are critically important when it comes to XBRL. The first is that BI applications tend to focus more on numbers, rather than text and numbers and therefore BI systems are limited in working with XBRL information which can contain both numbers and text. The second is that BI systems tend to focus on

[173] OLAP Cube, http://en.wikipedia.org/wiki/OLAP_cube
[174] Business Intelligence, http://en.wikipedia.org/wiki/Business_intelligence

numbers and like to help you aggregate those numbers because that is what OLAP does and in XBRL reports you don't want aggregation many times.

For example, if you ever tried to use an Excel pivot table which is basically a simple BI-type tool, you can see how a pivot table cannot quite do what you want to do in terms of rendering financial reporting information which has been expressed in XBRL.

A third important thing to realize is that BI system don't tend to provide easy ways to import metadata such as the information which is contained within an XBRL taxonomy which provides the schema for information contained within an XBRL instance.

BI systems are quite useful, but they need to go to the next level. Currently, BI systems seem to be focused on internal analytics within an organization or many times within a department of an organization which cannot work with the internal analytics of systems within the same organization. BI needs to be more externally oriented, bringing in information from whatever source, from whatever entity, internal or external.

10.18.4. Model based reporting and the multidimensional model

Model-based reporting is catching on in the financial reporting space. Enterprise software vendors such as IBM (IBM Cognos Financial Statement Reporting (FSR) External Reporting), SAP (SAP BusinessObjects Disclosure Management), and Oracle (Oracle Hyperion Disclosure Management) have model-based reporting software applications which support the creation of financial statements. Financial reporting can be seen as leading the way in model-based reporting.

But many other software companies are jumping into the model-based financial reporting arena.

Two companies which I will mention here are Quatrix and A3 Modeling because they have great videos which help understand what model-based financial reporting looks like. Here are those videos:

Quantrix Modeler: http://www.quantrix.com/tour/Concepts2.htm

A3 Modeling: http://a3solutions.com/advantages-of-a3-modeling/

Although, many of these model-based financial reporting solutions are tied too tightly to OLAP which means they are focused on numbers and not both numbers and textual information such as narratives found in financial reports.

10.18.5. Reconciling multidimensional terminology

The multidimensional model terminology associate with it. Unfortunately, there is not one standard, precise set of terms that everyone agrees on. But most models are fairly close. Symmetry Corp, a business intelligence consulting firm, has created a common model that it uses to reconcile all the different multidimensional model terminology used by the major software vendors they support. You can see this reconciliation here:

http://www.symcorp.com/downloads/ADAPT_white_paper.pdf

XBRL Dimensions terminology is yet another variation of multidimensional terminology. The US GAAP Taxonomy uses yet another set of terms in an attempt to make the multidimensional model easier for business professionals to make use of. The table below provides a reconciliation between this terminology:

Common BI or Multidimensional Model Term	XBRL Dimensions Term	US GAAP Term	Description
Scalar			Data that has no dimensions. For example, the value for pi (3.14) has no dimensions.
Cube, data cube, hypercube, pivot table, array, matrix, info cube	Hypercube	[Table]	Connection between a set of dimensions.
Dimension, characteristic, measure, axis	Dimension	[Axis]	A characteristic of the information. For example, "Geographic Area" may be a characteristic of the information and therefore a dimension.
Domain	Domain	[Domain]	Set of members of a dimension.
Member	Member	[Member]	A possible values of a dimension. For example, "Asia", "Europe", "North America", "South America" might be members of the "Geographic Area" dimension.
Measure	Primary item	[Line Items], Concept	Generally, in XBRL terms, the XBRL taxonomy concept dimension of information. For example the taxonomy concept "Sales" may be a primary item. NOTE: In BI, concepts are simply another dimension.
	Network	[Network]	Hypercubes exist within XBRL networks. A network may have one or more hypercubes within it. Networks are a way of physically separating sets of relations.
Navigational attribute, Flow		Number and category of network	Order or sequence of hypercubes
Fact, key figure	Fact	Fact	A fact is reported piece of information which could be numeric, non-numeric (i.e. strings), or narrative (i.e. TextBlock).
Fact table			Set of facts associated with a hypercube
Slice			A portion of a hypercube, somewhat like a filter, which allows information with more than two dimensions to be presented on a two-dimensional surface.
Formatting information, display attributes		Presentation relations	Information related to formatting, presenting, and/or rendering information from a hypercube.

If you are confused as to what a term means, the table above can be helpful in figuring out the definition of the term.

10.19. Problems with OLAP

OLAP, like any other tool, is not perfect. While some point out micro-level issues with OLAP[175], there are also macro level issues with OLAP. Here is a summary of issues with OLAP[176] that I have accumulated trying to understand and use OLAP tools to make use of XBRL:

- There is no global standard for OLAP
- Cube rigidity
- Limited computation support, mainly supports only roll ups
- Limited business rule support and inability to exchange business rules between implementations

[175] The Problems with OLAP, http://www.information-management.com/issues/20070301/1076555-1.html

[176] Understanding Cell Stores and NOLAP, the Future of the Spreadsheet, http://xbrl.squarespace.com/journal/2014/11/14/understanding-cell-stores-and-nolap-the-future-of-the-spread.html

- Inability to transfer cubes between systems, each system is a "silo" which cannot communicate with other silos
- Inability to articulate metadata which can be shared between OLAP systems
- Focus on numeric-type information and inconsistent support for text data types
- OLAP systems tend to be internally focused within an organization and do not work well externally, for example across a supply chain
- OLAP tends to be read only

10.20. Problems with electronic spreadsheets

While electronic spreadsheets are wonderful tools, electronic spreadsheets are not perfect tools. People point out the flaws of the electronic spreadsheet including[177]:

- Vulnerable to fraud
- Susceptible to trivial human errors
- Difficult to troubleshoot or test
- Obstructive to regulatory compliance
- Unfit for agile business practices
- Not designed for collaborative work
- Hard to consolidate
- Incapable of supporting quick decision making
- Unsuited for business continuity
- Scales poorly

Business professionals tend to love spreadsheets, information technology departments tend to loath electronic spreadsheets for the problems they cause.

10.21. XBRL is only one of many digital financial report technical syntax options

There are numerous technical syntaxes which are being used today to express financial information digitally and there will likely be many others.

- XBRL (Extensible Business Reporting Language), http://www.xbrl.org
- W3C Government Linked Data, http://www.w3.org/2011/gld/wiki/Main_Page
- W3C Linked Data, http://www.w3.org/standards/semanticweb/data
- Various forms of RDF, http://www.w3.org/RDF/ and OWL, http://www.w3.org/OWL
- Various forms of XML, http://www.w3.org/XML

[177] Top 10 Disadvantages of Spreadsheets, http://www.denizon.com/spreadsheets/top-10-disadvantages-of-spreadsheets/

And so, XBRL is only one of many technical syntax options. This document describes how to leverage XBRL for a model-based, semantic, global standard approach to digital financial reporting.

While the information in this document focuses specifically on XBRL, much of the information is applicable to using any technical syntax to express business information digitally.

10.22. Sweet-spot of XBRL-based business system to business system information exchange

When we think of financial reporting on usually thinks of word processor documents or electronic spreadsheets exchanged between business professionals. But financial reporting is actually much broader in scope than these work processor documents and electronic spreadsheets.

Many times the word processor documents or electronic spreadsheets end up being "cut and pasted" into other documents, spreadsheets, or systems. One case in point is how information from a financial statement is many times put into the system of a bank, regulator, or analyst to reuse that financial information in some manner many times over many years.

For contrast, look at the other end of the spectrum and what many people refer to as transactions. Be these accounting transactions or operating system transactions, transactions tend to be smaller in nature, while the information within the transaction may change, the form of the transaction generally does not change. While transactions are not considered model-based digital financial reports, the difference between these two offer an opportunity to understand the difference between the two.

Model-based digital financial reporting allows for formal agreement and therefore the opportunity to automate financial information exchanges of many types. While this approach is not generally appropriate for high volume, small, unchanging transactions; it does offer an opportunity to automate a number of information exchanges used within a business. The "sweet spot" of model-based digital financial reporting can be articulated as:

- **Larger transactions** which tend to change (i.e. such as a 50 or 100 page regulatory report with perhaps thousands of facts exchanged, as opposed to a small transaction with 10 data points)
- **Ad hoc exchanges** which seem to appear, all one needs to do is look at the electronic spreadsheets which you exchange today.
- **Business people changing the metadata**, no information technology department involvement required.
- **Information which needs to be reconfigured**, rather than a "form" (i.e. financial reports are not a form)
- **Zero (or low) tolerance for errors** in the information (i.e. everything must tick and tie and if things don't add up, bad things happen)
- **Business report focused** exchanges means that XBRL does not have to represent everything, it focuses on fact-based information exchanges and is

therefore easier to use because of the higher-level a business professional has to work with[178]

While other technical syntaxes are inflexible or too flexible and therefore too hard to use, XBRL offers a unique mix of characteristics which is balanced for business professionals to use.

10.23. Understanding the semantic spreadsheet

Imagine an improved electronic spreadsheet, a semantic spreadsheet[179] which overcomes many of the problems of how spreadsheets work today. Imagine an improved OLAP, or NOLAP (not only OLAP)[180]; where the spreadsheet is inherently a dynamic pivot table. Imagine a new take on spreadsheets[181]. Imagine an end to what is called "spreadsheet hell"[182].

This is my take on what is wrong with current electronic spreadsheets is this list of 5 fundamental problems that I see and how to fix those problems:

1. **Information is presentation oriented rather than meaning oriented**: Today's electronic spreadsheets, all of them, are made up of sheets which contain rows and columns which intersect to form cells. Information is entered into cells. All these rows, columns, and cells are presentation oriented. What if the information was meaning oriented instead? What is spreadsheet information was glued together by the meaning of the information?
2. **Business rules combined with spreadsheet information**: Spreadsheets today have the data within the spreadsheet combined with the business rules such as formulas for how information adds up, tests to make sure there are no errors, and other information mixed within the data of the spreadsheet. This can make it very hard to check a spreadsheet for errors or missing business rules. To look at this another way, imagine a spreadsheet which is verified using an *external set of business rules*. Sometimes the business rules could be publically available, other times the business rules would be securely available to a select group of users of the spreadsheet. The basic premise is that you can separate the business rules used to check the spreadsheet from the actual information which provides more control over both the business rules and the information. Plus, this means that the same set of business rules can be used across multiple spreadsheets to verify that the spreadsheets do not contain errors. Considering #1 above, the information, the business rules, and how the information is presented all really need to be separated to make the

[178] See *Understanding Blocks, Slots, Templates, and Exemplars*, http://xbrl.squarespace.com/journal/2015/5/11/understanding-blocks-slots-templates-and-exemplars.html
[179] See *Semantic spreadsheets*, http://xbrl.squarespace.com/journal/2013/4/18/semantic-spreadsheets.html
[180] See *Understanding Cell Stores and NOLAP, the Future of the Spreadsheet*, http://xbrl.squarespace.com/journal/2014/11/14/understanding-cell-stores-and-nolap-the-future-of-the-spread.html
[181] See *Time for a New Take on the Electronic Spreadsheet*, http://xbrl.squarespace.com/journal/2013/8/2/time-for-a-new-take-on-the-electronic-spreadsheet.html
[182] See *XBRL Ends Spreadsheet Hell*, http://xbrl.squarespace.com/journal/2009/5/2/xbrl-ends-spreadsheet-hell.html

spreadsheet more flexible. So, what if business rules could be external to the spreadsheet?

3. **Multiple copies of the same spreadsheet**: A big problem is multiple versions of the same spreadsheet and you lose track of which version is the correct version to be using. Many people refer to this issue as spreadsheet hell. More and more people are addressing this by storing spreadsheet information in a database and exposing the information view Excel, but saving the information into a database. The problem with this is see #1 above, the information stored is still presentation oriented and not meaning oriented. What if you addressed information by the meaning of the information, the characteristics of the information is how you identify the information?[183]
4. **Comparing information between spreadsheets can be a challenge**: If you have ever given a spreadsheet to two or more different people, had each person put information into the spreadsheet, and then tried to compare spreadsheet information you understand this situation. Reusing information contained in spreadsheets effectively can be a big challenge. What if you could compare meaning?
5. **Proprietary format, forced to use one software application**: Excel is a great software application for working with spreadsheets. But if you don't have Excel or someone you want to share information with does not have Excel and you want to exchange information, this can be problematic. The interoperability between Excel, Google Spreadsheets, and Apple Numbers spreadsheets is OK some times, but other times problematic. Standard formats such as Open Documents helps, but the standards focus on formatting of information, not the semantics of the information. Also, business rules are still embedded within the application. Further, Excel is a very "heavy" client. With tablet PCs and mobile devices growing in popularity, that becomes more and more of a problem. What if a spreadsheet was a global standard format, rather than a proprietary format of one software vendor?

Here are my requirements for a better spreadsheet[184]. This new improved version of a spreadsheet is not intended to replace 100% of all existing spreadsheets. Rather, this is intended to be a new alternative, a new category of spreadsheet. An alternative which could be used in 20% of the cases where more control is needed over spreadsheets (but I suspect the spreadsheet would be use in 80% of cases).

1. **Readable by both humans and machines**: A spreadsheet should be readable by both humans and machines. Information provided within a spreadsheet should be more a representation of information than presentation oriented. The representation can be presented in sheets, rows, columns, and cells but this is done leveraging information metadata and commonly understood patterns. 100% pixel perfect renderings are specifically not a requirement.
2. **Global standard format**: The format of the spreadsheet should be a global standard, not controlled by one software vendor.

[183] One software vendor calls this a "cell store", I believe a better term is a "fact store".

[184] See, *Need for New Global Standard Spreadsheet Alternative*, http://xbrl.squarespace.com/journal/2014/5/3/need-for-new-global-standard-spreadsheet-alternative.html

3. **Agreed upon level of semantics**: The creators and consumers can agree on the level of semantic clarity they will make use of for a spreadsheet. The spectrum can range from no semantics at all (which is similar to today's spreadsheet) or a high level of semantics expressed by a highly controlled representation model.
4. **Separation of representation and presentation**: The "representation" and the "presentation of the representation" should not be intermingled.
5. **Business rules separable from spreadsheet**: Business rules should be separated from the information when desired, integrated with the spreadsheet when necessary. Business rules which are external to the spreadsheet can be used to "watch over" the things and relations within the spreadsheet. The business rules can be made available publicly via a URL, privately via a private URL, etc.
6. **Managed global standard**: The better spreadsheet should be a global standard under the control of someone like OMG, XBRL International, ISO, Apache OpenOffice, or some other such organization.
7. **Provide a formal shape but be domain neutral filler**: One formal shape should be agreed to, for example the multidimensional model, but the pieces which fit into that shape or "fill" the shape are domain neutral, controlled by the business domain.
8. **Format should allow for versioning, collaboration, etc.**: The syntax format should allow for ease of versioning, constructing systems which are collaborative in nature (multi-user).
9. **Straightforwardly usable over the Internet**: The format should be compliant with internet standards.
10. **Support a wide variety of common business use cases**: A wide variety of common business use cases would be served, but it is not a goal to solve every business problem which exists.
11. **Highly limited options**: The number of optional features is to be kept to the absolute minimum, ideally zero. Multiple approaches to solving a problem are not necessary when one will do.
12. **Formal and concise design**: The design must be formal, concise, well designed and well-engineered.

11. Additional Resources for Getting Started

The following is helpful background material which will help you during your process of getting up to speed with model-based digital financial reporting including its core component XBRL. None of this material is required in order to fully use the material in this document. However, in order to understand the reasoning behind many decisions, to understand the XBRL technical syntax which lies behind this model, this information can be helpful.

The point of this document is to keep XBRL behind the scenes as much as possible. Most of this will be achieved by implementing software applications which absorbed the complexity of the XBRL technical syntax, allowing the business user to achieve what they need to achieve safely, robustly, reliably, and consistently; never having to understand the details of XBRL.

That said, many people like to "dink" around with their cars in their garage. If you don't know what you are doing, this can be dangerous. But, with good training, resources, or other help it can be useful to "get under the hood" so to speak. This is likewise true of XBRL.

11.1. Digital financial reporting and XBRL, the big picture

A good source for background information about XBRL-based digital reporting, what it is, what it does, what it means, problem it is trying to solve, how it is being used by others and other such background information read *XBRL for Dummies*. This is not a required step, but this step can be helpful if you want to get a complete picture of the landscape surrounding model-based digital financial reporting. The following URL points you to information on where to obtain this resource, details of what it contains, and other helpful information:

http://xbrl.squarespace.com/xbrl-for-dummies/

11.2. Hello world! example

If you don't know what a hello world example is, you probably should not even bother with this. If you do know what a hello world example, here is a hello world example of XBRL:

http://xbrl.squarespace.com/journal/2008/12/18/hello-world-xbrl-example.html

Again, this level of understanding can be helpful, but it is optional.

11.3. An XBRL technical syntax primer

Again, while not necessary, an understanding of the basics of the XBRL technical syntax can be helpful. Chapter 4 of *XBRL for Dummies* (see above) has a concise, but more importantly correct, primer of the XBRL technical syntax. Weighing in at a mere 28 pages, for those who desire or need this level of detail this is a great place to start. The XBRL technical specification is like reading the owner's manual. Even if you want to wade through that 158 page document, the primer will help you grasp the bigger picture framework into which to fit the details you will collect about XBRL.

11.4. Explore public company financial information

Ultimately, one of the primary reasons for taking the time and effort to structure financial information is so that the information can be extracted and used by automated machine-based processes. One very good example of this is the XBRL-based financial information reported by public companies to the U.S. Securities and Exchange Commission (SEC) and made available in their EDGAR system.

All that XBRL-based financial information is there and free to use.

The problem with that is that the information is made available in the raw XBRL technical syntax.

A software vendor, 28msec, has created a free publically available repository of public company financial information and provides access to machine-readable and human-readable information. That repository is called SECXBRL.info and is available here: http://app.secxbrl.info/. Information for the DOW 30 is available for free.

If you make your way to the list of the companies which make up the DOW 30, you can navigate through the information repository and explore. All the information came from XBRL-based digital financial reports.

ID	Archives	Profile	EntityName	CompanyType	SIC	SICDescription	SICGroup	Sector
http://www.sec.gov/CIK 0000066740	Link	SEC	3M CO	Corporation	3841	SURGICAL & MEDICAL INSTRUMENTS & APPARATUS	10	Measuring/Analyzing/Photographic/Control/Medical Instruments
http://www.sec.gov/CIK 0000004962	Link	SEC	AMERICAN EXPRESS CO	Corporation	6199	FINANCE SERVICES	7	Nondepository Credit Institutions
http://www.sec.gov/CIK 0000732717	Link	SEC	AT&T INC.	Corporation	4813	TELEPHONE COMMUNICATIONS (NO RADIOTELEPHONE)	11	Communications
http://www.sec.gov/CIK 0000012927	Link	SEC	BOEING CO	Corporation	3721	AIRCRAFT	5	Transportation Equipment
http://www.sec.gov/CIK 0000018230	Link	SEC	CATERPILLAR INC	Corporation	3531	CONSTRUCTION MACHINERY & EQUIP	10	Industrial/Commercial Machinery/Computer Equipment
http://www.sec.gov/CIK 0000093410	Link	SEC	CHEVRON CORP	Corporation	2911	PETROLEUM REFINING	4	Petroleum Refining and Related Industries
http://www.sec.gov/CIK 0000858877	Link	SEC	CISCO SYSTEMS, INC.	Corporation	3576	COMPUTER COMMUNICATIONS EQUIPMENT	3	Industrial/Commercial Machinery/Computer Equipment
http://www.sec.gov/CIK 0000021344	Link	SEC	COCA COLA CO	Corporation	2080	BEVERAGES	9	Food/Kindred Products
http://www.sec.gov/CIK 0000030554	Link	SEC	DUPONT E I DE NEMOURS & CO	Corporation	2820	PLASTIC MATERIAL, SYNTH RESIN/RUBBER, CELLULOS (NO GLASS)	6	Chemicals/Allied Products
http://www.sec.gov/CIK 0000034088	Link	SEC	EXXON MOBIL CORP	Corporation	2911	PETROLEUM REFINING	4	Petroleum Refining and Related Industries
http://www.sec.gov/CIK 0000040545	Link	SEC	GENERAL ELECTRIC CO	Corporation	3600	ELECTRONIC & OTHER ELECTRICAL EQUIPMENT (NO COMPUTER EQUIP)	10	Electronic/Other Electrical Equipment/Components
http://www.sec.gov/CIK 0000886982	Link	SEC	GOLDMAN SACHS GROUP INC	Corporation	6211	SECURITY BROKERS, DEALERS & FLOTATION COMPANIES	8	Securities and Commodities Brokers/Dealers/Exchanges/Services
http://www.sec.gov/CIK 0000354950	Link	SEC	HOME DEPOT INC	Corporation	5211	RETAIL-LUMBER & OTHER BUILDING MATERIALS DEALERS	6	Building Materials, Hardware, Garden Supply
http://www.sec.gov/CIK 0000050863	Link	SEC	INTEL CORP	Corporation	3674	SEMICONDUCTORS & RELATED DEVICES	10	Electronic/Other Electrical Equipment/Components
http://www.sec.gov/CIK 0000051143	Link	SEC	INTERNATIONAL BUSINESS MACHINES CORP	Corporation	3570	COMPUTER & OFFICE EQUIPMENT	[illegible]	Industrial/Commercial Machinery/Computer Equipment

Other sources are available, but what 28msec provides is one of the best organized financial information repositories. If you are really ambitious, you may want to explore the API reference and create something using Excel.

11.5. Putting the pieces together

Trying to understand calculus without knowing algebra is pointless. Often when you need to learn something it is important to breakdown what you want to learn into steps. You learn what you need to in step one, then you go to step two. You learn step two, then go to step three. And so on. Trying to skip steps causes frustration and other problems.

Learning about XBRL-based digital financial reporting requires you to progress through a series of steps. There are no short cuts. Master of model-based digital financial reporting will take an investment in time and effort, particularly today when software is not at the maturity level that it needs to be. If you don't want to put in this time and effort, wait for software to mature.

If you do want to make this investment, this material is laid out the way it is precisely to help you through these necessary steps. They will not turn you into a master, but they will set you on the path to mastery. Mastery takes even more time and effort. Again, there are no short cuts.

As such, progress through this material in the order provided, at least for the first time you work through it. After that, the material can be used as a reference.

12. Identifying and Defining Financial Report Semantics

In order to model a financial report digitally, the first step is to explicitly identify the pieces of a financial report. While most accountants who create financial reports don't think about financial reports in this way and while there is no global standard terminology which is agreed upon for these components, it does not mean that these pieces do not exist or that they cannot be defined.

In fact, that is precisely the purpose of the *Financial Report Semantics and Dynamics Theory*. This section summarizes this theory which provides an explicit, formal formulation which brings these financial report pieces into consciousness. The complete *Financial Report Semantics and Dynamics Theory* can be found here:

http://xbrl.squarespace.com/fin-report-sem-dyn-theory

12.1. Financial Report Semantics and Dynamics Theory

The *Financial Report Semantics and Dynamics Theory* provides a formal set of self-evident logical principles that no one would argue with (axioms) and deductions which can be proven by constructing a chain of reasoning by applying axioms (theorems) and then provides verification that these axioms and theorems hold up against a set of 8,098 SEC XBRL financial filings which show that these self-evident logical principles and deductions are true about financial reports.

The theory provides additional information such as an ethics or worldview of a financial report which helps tie other important information together.

The theory also explains the dynamics or "mechanics" or the mechanical nature of a financial report. While the information expressed by a financial report is far from mechanical, the mechanism by which the information is expressed, be that using printed paper or some digital technology, is in fact mechanical.

To obtain a thorough understanding of the theory you are encouraged to read through the entire theory.

The remainder of this section articulates information which helps to understand the pieces of a financial report. First we define the pieces of a financial report and relations between the pieces. We will then provide a narrative which helps the reader better understand the pieces and relations between the pieces of a financial report.

12.2. Pieces of a financial report

The following is a summary of the pieces which make up a financial report as identified by the *Financial Report Semantics and Dynamics Theory*.

- **Financial report**: Report which communicates financial and nonfinancial information to users of that report. Financial reports contain facts, characteristics which describe those facts, parenthetical explanations of facts, relations between facts/characteristics. Each of these report elements has properties.

- **Component**: A component is a set of facts which go together (tend to be cohesive and share a certain common nature) for some specific purpose within a financial report. A component can also be broken down into subcomponents (component blocks, disclosure blocks).
- **Fact**: A fact is reported. A fact defines a single, observable, reportable piece of information contained within a financial report, or fact value, contextualized for unambiguous interpretation or analysis by one or more distinguishing characteristics (properties of the fact). A fact value is one property of a fact. Every fact has exactly one fact value.
- **Characteristic**: A characteristic describes a fact (a characteristic is a property of a fact). A characteristic or distinguishing aspect provides information necessary to describe a fact or distinguish one fact from another fact. A fact may have one or many distinguishing characteristics.
- **Parenthetical explanation**: Facts may have parenthetical explanations which provide additional descriptive information about the fact.
- **Relation**: Components can be related to other components. Facts can be related to other facts. Characteristics can be related to other characteristics. Model structure is a type of relation which describes how report elements relate to one another. Business rules are a type of relation which describes computation type and logic-based relations.
- **Property**: Financial reports have a known set of properties. Components have a known set of properties. Facts have a known set of properties. Characteristics have a known set of properties. The concept characteristic has additional properties: period type, data type, balance type. Relations have a known set of properties.

12.3. Relations between numeric facts

Facts can be related to one another numerically. The following is a summary of these numeric relations.

- **Roll up**: Fact A + Fact B + Fact C = Fact D (a total)
- **Roll forward**: Beginning balance + changes = Ending balance
- **Adjustment**: Originally stated balance + adjustments = restated balance
- **Variance**: Actual amount – Budgeted amount = variance
- **Complex computation**: Net income / Weighted average shares = earnings per share
- **Hierarchy**: Facts are related in some way, but not numerically.

12.4. Relations between characteristics

Characteristics which describe a financial fact may, or may not, be related to one another.

Characteristics can represent a whole or some part of a whole. Parts may be related in different ways. The following is a summary of subclasses of whole-part types of

relations which may, or may not, be applicable to financial reporting. Other subclasses of whole-part relations may exist.

- **Component-integral object**: Indicates that a component contains some integral object. For example, the component handle is part of the integral object cup; wheels are a component part of a car; a refrigerator is a component of a kitchen.
- **Member-collection**: Indicates that some member is part of some collection. For example a ship is part of a fleet. Or, a subsidiary is part of an economic entity.
- **Portion-mass**: Indicates that some portion is part of some mass. For example a slice is part of a pie.
- **Stuff-object**: Indicates that some "stuff" is part of some object. For example steel is part of a car.
- **Feature-activity**: Indicates that some feature is part of some activity. For example the feature "paying" is part of the activity "shopping".
- **Place-area**: Indicates that some physical place is part of some area. For example the place "Everglades" is part of the area "Florida".

The above are general types of whole-part types of relations. There are likely financial reporting specific types of whole-part relations. Not all of the general whole-part relations are applicable to financial reporting.

Whole-part relations may involve numerical computations.

For example, the business segments of a reporting entity along with any consolidation eliminations can be identified, articulated, and aggregated to the consolidated entity. The spectrum of relations between characteristics is:

- **Partial set**: A partial sets are [Member]s of an [Axis] which do not comprise the full spectrum or universe of possible options. For example, "United States" and "Spain" is a partial set of countries.
- **Complete flat set**: A complete flat set is a "flat" (meaning no sub-relations) and complete list of [Member]s of an [Axis]. For example, a listing of all the business segments could be a complete flat set if it is (a) complete and (b) it is one flat list with no sub relations.
- **Complete hierarchical set**: A complete hierarchical set is like a complete flat set in that it is complete; however a complete hierarchical set does have sub relations making it hierarchical as compared to flat. For example, a list of the countries which make up the geographic areas of a reporting entity which is further grouped by regions into which each country fits is a complete hierarchical set.
- **Complete complex set**: A complete complex set is like a complete flat and complete hierarchical set in that it is complete; however the hierarchy of relations is not flat nor a simple hierarchy but rather the hierarchy is complex.

NOTE: Note that sets which are complete can be aggregated. A member aggregation is similar to a roll up in that it is an aggregation; however the aggregation is not across a set of [Line Items], rather there is only one [Line

Items] concept which is used by multiple facts, the aggregation is of the [Member]s which differentiate that single concept. The formula for a member aggregation is: Concept(Member 1) + Concept(Member 2) + Concept(Member N) = Concept(Default Member). The default member is generally intersected with some other financial report component. (Note that semantically, a member aggregation and a roll forward are identical. Syntactically, a roll up is expressed using XBRL calculations and a member aggregation must be expressed using XBRL Formula.)

12.5. Relations between components

A financial report has a flow, or an ordering or sequencing of the components which make up the financial report. Financial report creators have flexibility as to this flow, for example an income statement could come before or after a balance sheet.

12.6. Narrative

The following narrative is intended to further drill into the meaning of the parts of a financial report and the relations between the parts of a financial report.

A financial report communicates facts. Facts have fact values. Here are two facts:

Fact Value
2000
1000

Facts reported in a financial report have characteristics. Characteristics explicitly contextualize facts for unambiguous interpretation or analysis. Here are two facts and their characteristic "Concept" and the values for each Concept characteristic, "Revenues" and "Net income (loss)", which explicitly describe the two facts:

Concept	Fact Value
Revenues	2000
Net income (loss)	1000

Facts generally have more than one characteristic. Here is a complete set of characteristics which provide further explicit description for these two facts:

Reporting entity	Legal entity	Period	Concept	Fact Value
ABC Company	Consolidated entity	January 1, 2011 to December 31, 2011	Revenues	2000
ABC Company	Consolidated entity	January 1, 2011 to December 31, 2011	Net income (loss)	1000

And so a fact is a single, observable, reportable piece of information contained within a financial report, or fact value, contextualized for unambiguous interpretation or analysis by one or more characteristics. A fact is the value plus the characteristics which contextualize the value. Above you see two facts.

A set of facts which go together for some specific purpose is called a component. Financial reports have many components. Below you see a set of facts which go together to make up an income statement component. (Note that only a portion of the complete set of facts which would make up the entire income statement are shown):

Reporting entity	Legal entity	Period	Concept	Fact Value
ABC Company	Consolidated entity	January 1, 2011 to December 31, 2011	Revenues	2000
ABC Company	Consolidated entity	January 1, 2010 to December 31, 2010	Revenues	2500
ABC Company	Consolidated entity	January 1, 2009 to December 31, 2009	Revenues	2300
ABC Company	Consolidated entity	January 1, 2011 to December 31, 2011	Cost of revenues	1800
ABC Company	Consolidated entity	January 1, 2010 to December 31, 2010	Cost of revenues	1700
ABC Company	Consolidated entity	January 1, 2009 to December 31, 2009	Cost of revenues	1600
ABC Company	Consolidated entity	January 1, 2011 to December 31, 2011	Gross profit	200
ABC Company	Consolidated entity	January 1, 2010 to December 31, 2010	Gross profit	800

If you look at the set of facts above you note that the facts and their values and characteristics are organized in the form of a matrix or table. A table of facts, or fact table, is easy for a computer to read and understand but harder for a human to understand.

A fact table can also be better organized for human use by creating a rendering. A rendering is simply a fact table reorganized for presentation to a human. For example, below you see a fact table of an income statement which has been reorganized into a rendering:

Google Inc.

Component

CONSOLIDATED STATEMENTS OF INCOME
(In millions, except per share amounts)

Characteristic

	Three Months Ended June 30,		Six Months Ended June 30,	
	2011	2012	2011	2012
	(unaudited)			
Revenues:				
Google (advertising and other)	$ 9,026	$ 10,964	$17,602	$21,609
Motorola (hardware and other)	0	1,250	0	1,250
Costs and expenses:				
Cost of revenues – Google (advertising and other) (1)	3,172	3,984	6,107	7,773
Cost of revenues – Motorola (hardware and other) (1)	0	1,029	0	1,029
Research and development (1)	1,234	1,585	2,456	3,026
Sales and marketing (1)	1,091	1,433	2,117	2,702
General and administrative(1)	648	980	1,244	1,737
Charge related to the resolution of Department of Justice investigation	0	0	500	0
Total costs and expenses	6,145	9,011	12,424	16,267
Income from operations	2,881	3,203	5,178	6,592
Interest and other income, net	204	254	300	410
Income before income taxes	3,085	3,457	5,478	7,002
Provision for income taxes	580	672	1,174	1,327
Net income	$ 2,505	$ 2,785	$ 4,304	$ 5,675
Net income per share of Class A and Class B common stock:				
Basic	$ 7.77	$ 8.54	$ 13.37	$ 17.42
Diluted	$ 7.68	$ 8.42	$ 13.19	$ 17.17

Characteristic

Fact

(1) Includes stock-based compensation expense as follows:

Cost of revenues – Google (advertising and other)	$ 51	$ 82	$ 100	$ 156
Cost of revenues – Motorola (hardware and other)	0	5	0	5
Research and development	247	291	484	590
Sales and marketing	74	120	152	217
General and administrative	63	160	130	246

See accompanying notes.

Within the rendering you can better see the relations between the facts. For example "Income before income taxes" of 5,853 less the "Provision for income taxes" of 1,626 equals "Net income" of 4,227 for the period 2008. This relation between facts is called a "roll up". Relations between facts are expressed using business rules.

Different industries/activities and different reporting entities organize their facts in different ways.

Common characteristics of financial facts exist such as "reporting entity", "legal entity", "report date", "reporting scenario", "concept", and "period". Other characteristics exist which may, or may not, be appropriate for a specific reported fact.

Facts may have parenthetical explanations associated with them.

Financial reports, the components which make up a financial report, the facts within a financial report, the characteristics which describe facts, the relations between facts, and parenthetical explanations which further describe facts each has a specific set of properties. For example, a component has a label which might be "Income statement". A concept characteristic "Net Income" has a balance type property of "credit".

While we have only shown one component above, a financial report is generally made up of numerous components. Components are ordered or sequenced into a particular order by the financial report creator.

But if you break down the different components, they are always made up of the pieces described above and definable relations exist between the pieces.

13. Identifying Financial Reporting Domain Semantics

The previous section *Identifying and Defining Financial Report Semantics* discusses the semantics of the *financial report*. However, there is another layer of semantics which needs to be considered: financial reporting itself.

Financial reporting domain semantics are also identified and articulated within the *Financial Report Semantics and Dynamics Theory*. This section explains there domain level financial reporting semantics.

13.1. Difference between report level model semantics and financial reporting domain level semantics

The report level model describes the financial report itself and uses terms such as network, table, axis, member, line items, concept, fact, and parenthetical explanation. Report level model semantics relates to the report itself, the pieces of the financial report and how that report mechanically operates.

A semantic model is basically a set of business rules specific to the domain to which the semantic model relates. As such, a semantic model is more specific and the terminology used within the model is likewise more specific. A semantic model for external financial reporting might use terms such as balance sheet, income statement, accounting policies, disclosures and assets, net income, and net cash flows.

Financial reporting semantics describes financial reporting. Not all of financial reporting is described, in fact only the beginnings of the financial reporting semantics are described here. What is described here is only the tip of the iceberg but it helps accountants understand what financial reporting semantics are and it articulates base or core financial reporting semantics which are impossible to dispute.

This foundation will undoubtedly be built upon. It is with these financial reporting domain level semantics where the real value of digital financial reports becomes clear.

In this section the example used will be for US GAAP financial reporting by public companies to the Securities and Exchange Commission (SEC). This example is used for the following reasons:

- There are lots of publically available digital financial reports which can be worked with to prove or disprove these semantics. Far fewer IFRS based financial reports are available today.
- Trying to explain both US GAAP and IFRS semantics would become confusing as they are not totally aligned yet. The financial reporting semantics at the level which we are working at here are fairly consistent, but not identical.
- IFRS semantics can be explained as a variation of US GAAP financial reporting semantics at some later time.

13.2. Financial reporting conceptual framework

Financial reporting has a conceptual framework. The FASB outlines this conceptual framework in CON 1 – 7.

Per the FASB, the conceptual framework for financial reporting has two primary purposes. First, it serves as a foundation upon which the FASB constructs financial reporting standards that are internally sound and consistent. Second, the conceptual framework is intended to be used by the business community reporting or consuming financial information to help them better understand and apply financial reporting standards.

The conceptual framework does this by (per the FASB Special Report, *The Framework of Financial Accounting Concepts and Standards (1998)*:

- Providing a set of common premises as a basis for discussion
- Provide precise terminology
- Helping to ask the right questions
- Limiting areas of judgment and discretion and excluding from consideration potential solutions that are in conflict with it
- Imposing intellectual discipline on what traditionally has been a subjective and ad hoc reasoning process

As we shall see, the financial reporting conceptual framework breaks financial reporting into elements and financial statement components.

> NOTE: The FASB and IASB are creating a common framework for financial reporting (see http://goo.gl/4fSqO). The framework is not complete, but it does offer insight into the pieces of a financial report.

13.3. Financial report elements

The financial report elements articulated by the FASB are:

- Assets
- Liabilities
- Equity
- Investments by owners
- Distributions to owners
- Revenues
- Expenses
- Gains
- Losses
- Comprehensive income

While this is not a complete set of financial report elements, it is useful for identifying and organizing concepts which characterize a financial fact.

Other financial report elements which are not outlined by the FASB and which could exist within a financial report include:

- Policy
- Disclosure
- Document information
- Reporting entity information

13.4. Financial statement components

Financial statement components are defined by the FASB as:

- Balance sheet
- Income statement
- Comprehensive income
- Statement of changes in equity
- Cash flow statement
- Related disclosures

"Related disclosures", because the category can be quite large, can be further broken down into categories. These categorizations are used by the FASB Accounting Standards Codification (ASC). For more information see: https://asc.fasb.org (note that a free basic subscription is available):

- Organization
- Consolidation related disclosures
- Basis of reporting and presentation of financial statements
- Significant accounting policies
- Financial statement accounts related disclosures
- Broad transactions categories disclosures

13.5. Industries and reporting entities with certain activities have different reporting practices and therefore use the financial reporting conceptual framework differently

Reporting entities that belong to different industries and that have different activities may have different financial reporting practices. However, all reporting entities and all types of activities fit within the financial reporting conceptual framework under which they are reporting.

It is practice that a corporation reports "Stockholders' equity" and partnerships report "Partner capital" and that sole proprietors report "Owner's equity"; however, all three are "Equity" as defined by the financial reporting conceptual framework.

In practice a financial institution creates an unclassified balance sheet and general commercial and industrial companies create a classified balance sheet; but both types of reporting entities provide balance sheets.

While different industries and activities use components of the financial reporting framework differently, that does not change the financial reporting framework or change the fact that a financial reporting conceptual framework exists.

13.6. Common characteristics of financial facts exist

Some common characteristics that describe financial facts include:

- **Reporting entity** (which entity issued the reported fact; for example Microsoft or Google)
- **Legal entity** (to which legal entity does the reported fact relate; for example consolidated entity or parent holding company)
- **Report date** (what is the date on which the report was issued which contains the reported fact; for example the audit report date or the filing date)
- **Reporting scenario** (under which scenario was a fact reported; for example actual, budgeted, etc.)
- **Concept** or line item (what financial reporting concept describes the reported fact; for example Cash and cash equivalents, Assets, Net Income, etc.)
- **Calendar period** (to which period does the fact relate; for example which year or, current period, prior period, etc.)
- **Fiscal period** (to which fiscal period does the fact relate; for example, quarter 1, quarter 2, quarter 3, fiscal year)
- **Fiscal year** (to which fiscal year does the fact relate; for example 2011, 2012, 2013)
- **Business segment** (to which business segment does the fact relate; for example the consolidated entity, consolidation eliminations, subsidiaries or other business components)
- **Geographic area** (to which geographic area does the fact relate; for example all geographic areas combined, Europe, Asia)
- **Operating activities** (which type of operating activity describes the fact; continuing operations, discontinued operations)

Not all financial facts have all of these characteristics, but these are common characteristics. Other characteristics may also exist. Not all reporting entities which report financial information use these precise terms, however they use some term which basically means in essence what is outlined on the list above.

13.7. Financial report components may have core facts and relations common to all reporting entities

While not all financial reports have all facts in common, and different industries can have more or less in common, there are some core components which all accounting entities have. These facts can be thought of as "key stones" or "corner stones" which hold a financial report together or provide somewhat of a "skeleton" for a financial report. Note that this is not to say that all accounting entities report these accounting concepts; if a concept is not reported it can be logically imputed.

For example, these are fundamental accounting concepts which are common to all reporting entities in all industries and relations which exist between these concepts which can never change:

- Assets = Liabilities and Equity
- Assets = Current Assets + Noncurrent Assets (classified balance sheet)
- Equity = Equity Attributable to Parent + Equity Attributable to Noncontrolling Interest
- Liabilities = Current Liabilities + Noncurrent Liabilities (classified balance sheet)
- Liabilities and Equity = Liabilities + Commitments and Contingencies + Temporary Equity + Equity
- Assets = Liabilities + Commitments and Contingencies + Temporary Equity + Equity
- Liabilities = Liabilities and Equity - (Commitments and Contingencies + Temporary Equity + Equity)
- Current Assets = Assets - Noncurrent Assets (classified balance sheet)
- Current Liabilities = Liabilities - Noncurrent Liabilities (classified balance sheet)
- Noncurrent Assets = Assets - Current Assets (classified balance sheet)
- Noncurrent Liabilities = Liabilities - Current Liabilities (classified balance sheet)
- Gross Profit = Revenues - Cost Of Revenue (Multi-step approach)
- Operating Income (Loss) = Gross Profit - Operating Expenses + Other Operating Income (Multi-step approach)
- Income (Loss) from Continuing Operations Before Equity Method Investments = Operating Income (Loss) + Nonoperating Income (Loss) - Interest And Debt Expense
- Income (Loss) from Continuing Operations Before Tax = Income (Loss) from Continuing Operations Before Equity Method Investments + Income (Loss) from Equity Method Investments
- Income (Loss) from Continuing Operations after Tax = Income (Loss) from Continuing Operations Before Tax - Income Tax Expense (Benefit)
- Net Income (Loss) = Income (Loss) from Continuing Operations After Tax + Income (Loss) from Discontinued Operations, Net of Tax + Extraordinary Items, Gain (Loss)
- Net Income (Loss) = Net Income (Loss) Attributable to Parent + Net Income (Loss) Attributable to Noncontrolling Interest
- Net Income (Loss) Available to Common Stockholders, Basic = Net Income (Loss) Attributable to Parent - Preferred Stock Dividends and Other Adjustments

- Comprehensive Income (Loss) = Comprehensive Income (Loss) Attributable to Parent + Comprehensive Income (Loss) Attributable to Noncontrolling Interest
- Comprehensive Income (Loss) = Net Income (Loss) + Other Comprehensive Income (Loss)
- Operating Income (Loss) = Revenues - Costs And Expenses + Other Operating Income (Single-step approach)
- Costs And Expenses = Cost Of Revenue + Operating Expenses (Single-step approach)
- Net Cash Flow = Net Cash Flows, Operating + Net Cash Flows, Investing + Net Cash Flows, Financing + Exchange Gains (Losses)
- Net Cash Flows, Continuing = Net Cash Flows, Operating, Continuing + Net Cash Flows, Investing, Continuing + Net Cash Flows, Financing, Continuing
- Net Cash Flows, Discontinued = Net Cash Flows, Operating, Discontinued + Net Cash Flows, Investing, Discontinued + Net Cash Flows, Financing, Discontinued
- Net Cash Flows, Operating = Net Cash Flows, Operating, Continuing + Net Cash Flows, Operating, Discontinued
- Net Cash Flows, Investing = Net Cash Flows, Investing, Continuing + Net Cash Flows, Investing, Discontinued
- Net Cash Flows, Financing = Net Cash Flows, Financing, Continuing + Net Cash Flows, Financing, Discontinued

For example, these are financial reporting facts common to many financial reports issued by many type of reporting entity in many industries:

- Balance sheets always have “Assets”, “Liabilities and Equity” and “Equity” reported
- On the balance sheet, assets foots
- On the balance sheet, liabilities and equity foots
- On the balance sheet, equity foots
- Balance sheets balance
- Income statements always report net income (loss)
- On the income statement, net income (loss) foots
- Cash flow statements report net cash flow
- On the cash flow statement, net cash flow foots
- Net cash flow per the cash flow statement reconciles beginning and ending cash and cash equivalents
- Cash and cash equivalents per the cash flow statement and cash and cash equivalents per the balance sheet are the same fact
- Beginning and ending balances of equity per the statement of changes in equity agree with equity balances per the balance sheet

There could be other core components and relations, but the above are certainly true, if someone reports the statements. It is possible for a reporting entity not to have a cash flow statement or income statement. It is less likely for a company to not have a balance sheet.

To test the notion of these core financial report semantics, the *Financial Report Semantics and Dynamics Theory* tested 8,098 SEC XBRL financial filings. The following is an overview of the results obtained. Note that total results for all 8,098 filings were provided with additional breakdowns for the 30 Dow industrial companies, top 100 companies by total assets and top 1,000 companies by total assets.

#	Test	All 8,098 Companies	*30 Dow Industrial Companies*	*Top 100 Companies*	*Top 1,000 Companies*
1	Balance sheet reports assets	100%	*100%*	*100%*	*100%*
2	Balance sheet reports liabilities and equity	97%	*96%*	*99%*	*99%*
3	Balance sheet reports equity	97%	*100%*	*100%*	*99%*
4	Balance sheet balances	98%	*96%*	*99%*	*99%*
5	Cash flow statement reports net cash flow	98%	*100%*	*93%*	*98%*
6	Income statement reports net income (loss)	98%	*100%*	*98%*	*99%*
7	Income statement reports income (loss) from continuing operations	72%	*73%*	*76%*	*78%*
8	Entity name reported	100%	*100%*	*100%*	*100%*

The importance of these cornerstone facts and relations is that they may form a foundation for a comparability framework. The presence of this category of facts might provide us with information about the specific types of components that are reported and the relations between components that must hold true if they are reported. They are the links in the integrity foundations for financial reports.

Different industries may have different core financial report facts common within certain components.

13.8. Reporting entities which created financial reports can be categorized into industries/activities

Industries and activities have unique financial reporting and accounting practices. The following is a summary of some reporting industries and the activities which a reporting entity may have:

- Commercial and Industrial (general, not classified into some other industry or activity)
- Agriculture
- Airlines
- Banking and Thrift
- Broadcasting
- Broker and Dealers of Securities
- Cable Television
- Casinos
- Contractors
- Development Stage Enterprises

- Extractive Activities
- Financial Services Title Plant
- Franchisor
- Health Care
- Insurance
- Investment Companies
- Motion Pictures
- Mortgage Banking
- Not for Profit
- Real Estate
- Records and Music
- Regulated Entities
- Retailers
- Software

Other industries and activities exist.

13.9. Financial analysts use certain common key financial ratios when analyzing financial report information

The following is a summary of some common key ratios used:

- Return on Investment
- Return on Equity
- Return on Total Assets
- Operating Profit
- Sales to Accounts Receivable
- Sales to Inventories
- Sales to Fixed Assets
- Inventory Days
- Debtor Days
- Corporate Liquidity
- Working Capital
- Current Ratio
- Quick Ratio
- Working Capital to Sales
- Interest Cover
- Debt to Equity
- Market Capitalization
- Dividends Per Share
- Dividends Cover Payout Ratio
- Earnings Yield
- Dividends Yield
- Price to Earnings Ratio
- Market to Book Ratio
- Capital Employed
- Working Capital Days
- Assets Employed
- Profit Margin
- Asset Turn
- Sales Margin
- Sales Turn

Other common key ratios exist.

13.10. Financial reports are a true and fair representation of the reporting entity's financial information

Stating this in the opposite makes the statement above clear, "Financial reports are untrue and unfair representations of a reporting entity's financial information." Of course that statement is incorrect.

A financial report can be said to be a verifiably true and fair representation of the reporting accounting entity's financial information if it possesses certain traits which can be defined in general terms and for clarity are listed below:

- **Completeness**: Having all necessary or normal parts, components, elements, or steps; entire.
- **Correctness**: Free from error; in accordance with fact or truth; right, proper, accurate, just, true, exact, precise.
- **Consistency**: Compatible or in agreement with itself or with some group; coherent, uniform, steady. Holding true in a group, compatible, not contradictory.
- **Accuracy**: Correctness in all details; conformity or correspondence to fact or given quality, condition; precise, exact; deviating only slightly or within acceptable limits from a standard.

While these four notions which relate to the "trueness" and "fairness" must exist for every fact reported by a financial report, they also need to exist when considering the financial report in its entirety.

Two other notions help bring the notion of trueness and fairness of information at the fact and at the report level into focus:

- **Fidelity**: Fidelity relates to the loyal adherence to fact or detail; exactness. The faithful representation of the facts and circumstances represented within a financial report properly reflect, without distortion, reality. High fidelity is when the reproduction (a financial report) with little distortion, provides a result very similar to the original (reality of company and environment in which company operates).
- **Integrity**: Integrity is holistic fidelity. Integrity relates to the fidelity of the report in its entirety, of all parts of a financial report, from all points of view. Integrity is holistic accuracy, accurate as a whole. Integrity is the quality or condition of being whole or undivided; completeness, entireness, unbroken state, uncorrupt. Integrity means that not only is each component of a financial report is correct but all the pieces of the financial report fit together correctly, all things considered.

13.11. Financial reports have traits which impact their quality

The following list expresses the traits of a quality financial report.

- **All financial report formats convey the same message**: A financial statement can be articulated using paper and pencil, Microsoft Word, PDF, HTML, XBRL, or other format. But while the format may change, the message communicated, the story you tell, should not change. Each format should

communicate the same message, regardless of the medium used to convey that message.

- **Information fidelity and integrity**: A financial report is internally consistent, a faithful representation. A financial statement foots, cross casts, and otherwise "ticks and ties". The accountant community understands this and many times this fact disappears into unconsciousness because it is so ingrained. Of course things foot and cross cast; of course the pieces tie together. Said another way, a financial statement must be correct, complete, consistent, and accurate. Only trained accounting professionals who understand how the XBRL medium works can tell if all financial statement computations are properly articulated and verified to be correct.
- **Justifiable/defensible report characteristics**: Facts reported and the characteristics which describe those reported facts should be both justifiable and defensible by an accounting entity reporting such facts.
- **Consistency between periods**: Generally financial information expressed within one period should be consistent with the financial information expressed within subsequent periods, where appropriate. Clearly new information will be added and information which becomes irrelevant will be removed from a financial report. Changes between report elements which existed in both periods should be justifiable/defensible as opposed to arbitrary and random.
- **Consistency with peer group**: If your company chooses one approach and a peer chooses another report element selection choice; clearly some good reason should probably exist. This is not to say differences would not or should not occur. Rather, why the differences exist should make sense. Generally financial information between two peers should be more consistent as compared to inconsistent.
- **Logical representations indicated by understandable renderings**: Human readable renderings of facts; characteristics that describe facts; parenthetical explanations which further describe such facts; and other such representation structures should make sense and be both consistent with other similar representation structures. While there may be differences of opinion as to how to format or present such information; there should be significantly less or no dispute about the logic of a machine readable representation.
- **Unambiguous business meaning**: A financial report should be unambiguous to an informed reader. The business meaning of a financial report should be clear to the creator of the financial report and likewise clear to the users of that financial report. Both the creator and users should walk away with the same message or story. A financial report should be usable by regulators, financial institutions, analysts, investors, economists, researchers, and others to desire to make use of the information the report contains as they see fit.

13.12. Financial reports are used individually, compared across periods, and compared across reporting entities

Financial reports are used in different ways by users including:

- **Analysis of a single financial report**: Analysis of one financial report of one reporting entity.
- **Time series analysis of reporting entity**: Two or more financial reports of the same reporting entity are compared.
- **Comparative analysis across reporting entities**: Two or more financial reports of different reporting entities are used.
- **Ratio analysis**: An analysis of a single financial report, a time series analysis, or a comparative analysis using ratios computed from facts within a report.

13.13. Reporting entity segment definitions are inconsistent in financial reporting literature

The segments into which a reporting entity can be broken down are defined inconsistently in the financial reporting literature. From FASB Accounting Standards Codifications, ASC 280 relates to the classification of assets and sometimes liabilities uses the terms operating segments and reportable segments of the business. ASC 350 which relates to impairment uses the term reporting unit. ASC 860 which relates to special-purpose entities and the master glossary uses the term business. ASC 360 which relates to long-lived assets uses the term asset groups and disposal groups.

As such, the following terminology is proposed:

- Consolidated entity
- Parent holding company
- Operating segment (ASC 280)
- Reportable segment (ASC 280)
- Reporting unit (ASC 350)
- Business (ASC 805)
- Asset group (ASC 360)
- Disposal group (ASC 360)

14. Identifying Financial Report Model Elements

In this section we describe the financial report model elements which are used to implement a digital financial report. See the appendix, Report Element Properties, which provides a reconciliation between the *Financial Report Semantics and Dynamics Theory* to this model.

This model is based on the model used by the US GAAP XBRL Taxonomy Architecture and SEC XBRL financial filings. Rather than reinventing another set of terminology, that terminology was used. Further, while strictly following this model is not required (i.e. there are other allowed approaches); we do strictly follow one explicit, logical, allowed approach. For more information relating to this model and the US GAAP Taxonomy architecture and SEC XBRL financial filing logical model upon which this model is based, please see this wiki for the most detailed and most current information:

http://secxbrlglossary.wikispaces.com/

This is only one of many digital financial report profiles which may ultimately exist. The *SEC XBRL Financial Filing Profile* is documented on the wiki above. This profile is an implementation model for working with XBRL-based digital financial reports.

14.1. Differentiating XBRL technical syntax and model

This section provides a high level overview of XBRL technical syntax terminology and reconciles that terminology to the financial report model. This section is useful to those more familiar with the XBRL technical syntax than with this model.

From a technical point of view, a digital financial report consists of two primary physical components using the XBRL technical syntax: an XBRL instance and an XBRL taxonomy.

An **XBRL instance** is a physical document just like your HTML document or Word document which contains the financial information you report. While the information is the same, the format of the information is different, it is XBRL. An XBRL instance contains things such as:

- The financial and nonfinancial **facts** which you report. An example of a fact is Cash and Cash Equivalents for the current fiscal period of December 31, 2010, reported by the consolidated entity which has the SEC CIK number 0123456789 whose value is $1,000,000 reported in thousands of US Dollars.
- The **values** of those financial and nonfinancial facts. The value $1,000,000 is an example of a value.
- **Characteristics** which describe those facts. The CIK number 0123456789, the consolidated entity, the period December 21, 2010 are examples of characteristics.
- **Other traits** which help you understand values of facts which are numeric in nature. Stating that the value is in US Dollars and expressed in thousands are examples of other attributes.

- Any other **parenthetical explanations or footnotes** which help describe those facts. You may want to provide some kind of notation which appears as a footnote within your report. These are provided using XBRL footnotes.

Not that you would ever need to look at this XBRL instance, it is really meant for computers to understand and process for the user of the information; but if you are curious, this is what XBRL looks like this:

```
<us-gaap:CashAndCashEquivalentsAtCarryingValue contextRef="I-2010" unitRef="U-Monetary" decimals="-
  3">11000000</us-gaap:CashAndCashEquivalentsAtCarryingValue>
<us-gaap:RestrictedCashAndInvestmentsCurrent contextRef="I-2010" unitRef="U-Monetary" decimals="-3">1000000</us-
  gaap:RestrictedCashAndInvestmentsCurrent>
<us-gaap:ShortTermInvestments contextRef="I-2010" unitRef="U-Monetary" decimals="-3">1000000</us-
  gaap:ShortTermInvestments>
```

It may seem odd to express all the details described above, but remember; computers are not very smart. Things that humans can generally figure out by reading a report have to be expressed explicitly so that a computer can understand what to do with them.

The second major piece of a digital financial report is the XBRL taxonomy. An **XBRL taxonomy** can be thought of as a dictionary. The taxonomy provides the definitions of the concepts used in your report, definitions of many of the characteristics which help explain your financial report, relations between the concepts and characteristics, and the business rules which exist between concepts. All this information is used by the XBRL instance.

Some of the concepts, characteristics, relations, and business rules are pre-defined for you by the FASB in the US GAAP Taxonomy. But each SEC filer can also create the concepts, characteristics, relations and business rules that uniquely define their organization.

Part of the art and science of using XBRL is to figure out when you use the predefined concepts and characteristics and when to define your own.

As pointed out previously, many times a logical or conceptual model is created to work with complex technical things. We have all worked with electronic spread sheets. They are easy to use because the software interface which you work with exposes you to familiar terms similar to paper spread sheets. Things like workbooks, spread sheets, rows, columns, and cells are recognizable and organized into a logical model which we understand.

XBRL is a technical syntax. The XBRL technical syntax is implemented by the US GAAP taxonomy using a specific architecture or application profile. This application profile is laid out in the US GAAP Taxonomy Architecture. That architecture exposes a logical model.

An SEC XBRL financial filing can be summarized into a concise set of logical components, a logical model: networks, tables, axis, line items, facts, etc. These terms are easier to work with and understand than the XBRL technical syntax.

The US GAAP Taxonomy which is used for SEC XBRL financial filings is also used for this digital financial reporting model. Further, this same model can be applied to more general digital financial reporting.

14.2. Report elements overview

The following is an overview of the report element categories into which all report elements fit which make up this model. Each of these report element categories will be explained in further detail within this section.

- **Network**: A network is one approach to break a digital financial report into smaller pieces. There are two reasons why you might need to break a financial filing into pieces: because you want to or because you have to. Specific semantics of networks are undefined.
- **Table**: A table is used to combine facts which go together for some specific reason. Tables are comprised of axis and line items. The line items of a table share the axis defined within a table. There are two types of tables: explicit tables and implicit tables. Implicit tables only have the axis reporting entity and period. An explicit table always has at least one defined [Axis], it could have more than one. An explicit [Table] always has one set of [Line Items]. Specific semantics of tables are undefined.
- **Axis**: An axis is a means of providing information about the characteristics of a fact reported within a financial report.
- **Member**: A member is a possible value of an [Axis]. A [Member] is always part of a domain of an [Axis], thus the term "member" (i.e. of the domain or set; a domain is simply a set of [Member]s which relates to a specific [Axis]). Members of an [Axis] tend to be cohesive and share a certain common nature.
- **Line Items**: [Line items] are a set of concepts which can be reported by an entity, they can contain values. [Line Items] may also contain [Abstract] concepts which can never report values but rather are used to help organize the [Line Items].
- **Concept**: A concept refers to a financial reporting concept or a non-financial concept which can be reported as a fact within an SEC XBRL financial filing. A concept is sometimes referred to as a concrete concept, as compared to an abstract concept (see next report element). [Line Items] contain Concepts organized within a component which have the same information model. Concepts can be concrete (meaning they can be reported) or abstract (meaning that they are never reported; they are only used to organize the concepts contained within a set of line items).
- **Abstract**: An Abstract is a class of Concept. Abstracts are used for organization and can never be reported. Abstracts can be used within a [Line Items] or it can be used to organize the Tables within a Network.
- **Fact**: A fact is reported. A fact defines a single, observable, reportable piece of information contained within a financial report, or fact value, contextualized for unambiguous interpretation or analysis by one or more characteristics. Numeric fact values must also provide the additional traits "units" and "rounding" to enable appropriate interpretation of the numeric fact value. Facts may have zero or many parenthetical explanations which provide additional descriptive information related to the fact.

Information expressed by a digital financial report are called **facts**. Facts are expressed within **tables** which connect a set of **axis** which express the

characteristics of the facts and a set of **line items** which connect the facts to some financial reporting **concept**. Tables can be organized within **networks**. The characteristics of the fact, expressed as an axis are organized into a domain of **members**. In addition, **footnotes** can be used to elaborate on facts.

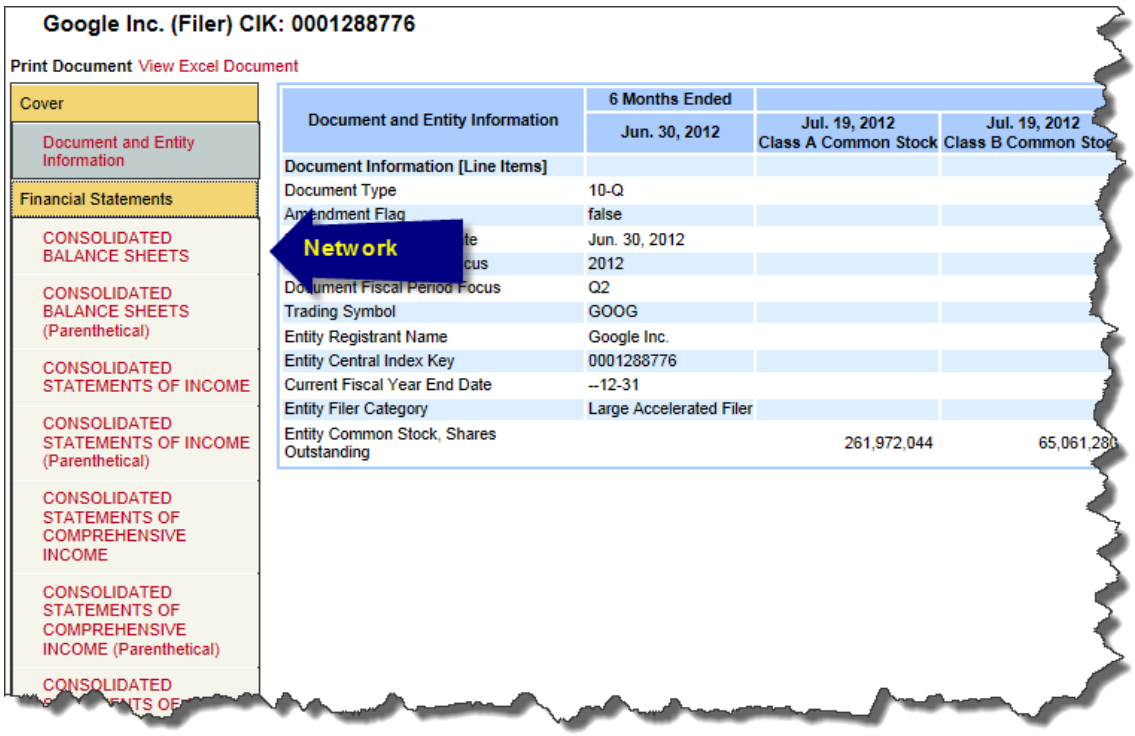
For example, Net Income (Loss) [a concept] of $1000 [the value of a fact] for the period ended December 31, 2010 [a characteristic of the fact] for the consolidated entity [another characteristic of the fact] of the reporting entity with the CIK number 1080224 [yet another characteristic of the fact] may be a fact reported within an SEC XBRL filing.

14.3. Network

A **network** is a one approach to break a digital financial report into smaller pieces. There are two reasons why you might need to break a financial filing into pieces: because you want to or because you have to.

Networks you create have a direct impact on what is seen within a rendering engine such as the SEC XBRL Interactive Data Viewer and other software that produce renderings of SEC XBRL financial filings or other digital financial reports.

Consider the following screen shot of the SEC Interactive Data Viewer:



And now consider this screen shot of the XBRL taxonomy which supports the XBRL instance being viewed within the SEC XBRL Interactive Data Viewer:

- Network (101 - Document - Document and Entity Information)
- Network (103 - Statement - CONDENSED CONSOLIDATED BALANCE SHEETS)
- Network (104 - Statement - CONDENSED CONSOLIDATED BALANCE SHEETS (Parenthetical))
- Network (105 - Statement - CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS)
- Network (106 - Statement - CONDENSED CONSOLIDATED STATEMENTS OF CHANGES IN COMMON STOCKHOLDERS' EQUITY)
- Network (107 - Statement - CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS)
- Network (108 - Disclosure - BASIS OF PRESENTATION)
- Network (109 - Disclosure - REVENUE RECOGNITION)
- Network (110 - Disclosure - INCOME (LOSS) PER SHARE)
- Network (111 - Disclosure - SOFTWARE DEVELOPMENT COSTS)
- Network (112 - Disclosure - LONG-TERM DEBT)
- Network (113 - Disclosure - STOCK-BASED COMPENSATION)
- Network (114 - Disclosure - CONCENTRATION OF RISK AND FAIR VALUE OF FINANCIAL INSTRUMENTS)
- Network (115 - Disclosure - SEVERANCE COSTS)
- Network (116 - Disclosure - REDEEMABLE PREFERRED STOCK)
- Network (117 - Disclosure - RELATED PARTY TRANSACTIONS)
- Network (118 - Disclosure - INCOME TAXES)
- Network (119 - Disclosure - RECENT ACCOUNTING PRONOUNCEMENTS)
- Network (120 - Disclosure - MERGER AGREEMENT AND STOCK SALE AGREEMENT)

Creating a network causes a section to appear within the left hand navigation pane of the SEC XBRL Interactive Data Viewer application. You can create these networks as you desire to organize how this information would appear within a software application.

These networks have three parts: a *number,* a *category,* and a *label*. The number determines the order of the network in the rendering. The category determines which section the network appears in the SEC XBRL Interactive Data Viewer. The categories are: Document, Statement, and Disclosure. The label provides specific information about what the network contains.

The second reason you would create a network is because you have to. Suppose, for example, that you wanted to articulate the breakdown of trade receivables in multiple ways:

	2010	2009
TRADE AND OTHER RECEIVABLES		
Trade and Other Receivables, Net, by Component		
Trade Receivables, Net	8,790	6,431
Financing Lease Receivables, Net	2,498	1,263
Other Receivables, Net	1,305	1,096
Trade and Other Receivables, Net	12,593	8,790
Trade and Other Receivables, Net, by Net/Gross		
Trade and Other Receivables, Gross	18,280	13,472
Allowance for Doubtfull Accounts	-5,687	-4,682
Trade and Other Receivables, Net	12,593	8,790
Trade and Other Receivables, Net, by Current/Noncurrent		
Trade Receivables, Net, Current	6,340	5,701
Trade Receivables, Net, Noncurrent	6,253	3,089
Trade and Other Receivables, Net	12,593	8,790

A network separates things which would otherwise collide. To avoid these three breakdowns of the same concept "Trade and Other Receivables, Net" from colliding; a network must be created for each to separate them. As such, you may need to create networks sometimes when you would prefer not to.

> HINT: The term "network" may seem odd. But this is actually just like how different radio or television frequencies are separated, thus the term network.

14.3.1. Number

A network is assigned a number. The number is used to order or provide a sequence for the networks.

14.3.2. Category

A network has a category. The categories are: Document, Statement, Schedule, and Disclosure. The category impacts which section of the SEC interactive viewer the network shows up.

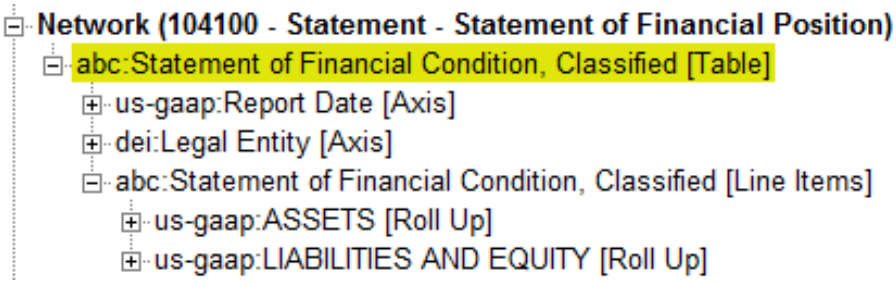
14.3.3. Label

A network has a label. The label describes what the network contains.

14.4. Table

A **table** is used to combine facts which go together for some specific reason. Tables are comprised of axis and line items. The line items of a table share the axis defined within a table.

There are two types of tables: explicit tables and implicit tables. Implicit tables only have the axis reporting entity and period. An explicit table always has at least one explicit axis, it could have more than one. An explicit table always has one set of line items.



Note the table above which has two **axis** "Report Date [Axis]" and "Legal Entity [Axis]" and one set of **line items** "Statement of Financial Condition, Classified [Line Items]".

> HINT: Defining unique, smaller, explicit tables is superior to using the implicit tables, repeating table names, and larger tables. Further, you get better control over the SEC Interactive Data Viewer and other rendering software with smaller explicit tables.

HINT: Generally today it is better to have a one-to-one correlation between a network and a table. This approach is generally more reliable, more predictable, and therefore safer. However, it is appropriate and acceptable for a network to contain more than one table.

14.4.1. Explicit tables

You can use a table from the US GAAP taxonomy or you can define your own tables. For example, you might create the table "Debt Instruments [Table]" if you needed it but it did not exist within the US GAAP taxonomy.

14.4.2. Implicit tables

There is another way you can create a table which is to use what amounts to a default table. If you define concepts in your taxonomy and you do not explicitly put them into an existing US GAAP taxonomy table or a table which you define, you are putting that concept into an implicit table.

HINT: Using implied tables is not encouraged, defining tables explicitly is a better approach.

14.5. Axis

An **axis** is a means of providing information about the characteristics of the concepts for the line items within a table regardless of whether that table is explicitly or implicitly defined.

Explicitly defined [Table]s are the only tables to which you can add axes. All tables, be they explicitly defined or implicitly defined, have two axis which will always be there: entity and period.

- **Entity**: The entity, or "Reporting Entity" axis, always exists for an explicit or implicit table and the entity axis is always the SEC filer CIK number.
- **Period**: The period axis, or reporting period, always exists for an explicit or implicit table.

Using axis defined by the US GAAP taxonomy is preferred and would commonly be available; but if an axis which you need does not exist, you can create an axis to articulate the characteristics you need communicated. Other explicit axis which might be defined could include things such as:

- Class of common stock [Axis]
- Subsequent event type [Axis].

Here is an example of a [Table], its three [Axis], and its [Line Items]:

- **Network (309000 - Disclosure - Note H. Nonmonetary Transactions)**
  - us-gaap:Nonmonetary Transaction, by Type [Table]
    - abc:Report Date [Axis]
    - dei:Legal Entity [Axis]
    - us-gaap:Nonmonetary Transaction Type [Axis]
      - us-gaap:Nonmonetary Transaction Type [Domain]
        - us-gaap:Receipt of Assets in Satisfaction of Debt [Member]
        - us-gaap:Advertising Barter Transactions [Member]
        - us-gaap:Inventory Exchanges [Member]
    - us-gaap:Nonmonetary Transaction [Line Items]

Note the **axis** "Nonmonetary Transaction Type [Axis]" above, its **domain** and its **members**.

14.6. Member

A **member** is a possible value of an axis. A member is always part of a domain of an axis, thus the term "member" (i.e. of the domain or set). Members of an [Axis] tend to be cohesive and share a certain common nature. A member expresses the value of the axis or characteristic being described. For example, the "Consolidated Entity [Member]" might be the value of the characteristic "Legal Entity [Axis]".

Here is an example of an axis, its domain and its members:

- us-gaap:Nonmonetary Transaction Type [Axis]
  - us-gaap:Nonmonetary Transaction Type [Domain]
    - us-gaap:Receipt of Assets in Satisfaction of Debt [Member]
    - us-gaap:Advertising Barter Transactions [Member]
    - us-gaap:Inventory Exchanges [Member]

A domain is a cohesive set of members. The set of members which comprise a domain share a certain common nature. Domains have partitions. A partition is collectively exhaustive and mutually exclusive set of members within a domain. Partitions do not overlap. Given a set X, a partition is a division of X into non-overlapping and non-empty "parts" or "blocks" or "cells" that cover all of X. More formally, these "cells" are both collectively exhaustive and mutually exclusive with respect to the set being partitioned. Domains always have at least one partition and may have many partitions.

A domain could have subdomains.

For example, say you have the axis "Business Segments [Axis]". That axis might have the domain "Business Segments, All [Member]" which represents the total of all business segments, the sum of all the members. That is a usable domain. Whereas, suppose you had the axis "Subsequent Event Types [Axis]". Subsequent events are never aggregated, so you would never use that domain. But you would still need to provide a domain such as "Subsequent Event Types, all types [Member]", even though that domain would never actually be used within a report.

14.7. Member arrangement patterns

The **members** of a domain have relations to one another. These relations are referred to as **member arrangement pattern**. There are two dynamics which

impact domain aggregation. The first is whether you have a **partial set** or a **complete set** represented by the domain members. The second dynamic is whether the set aggregates or adds up. An axis which express partial sets and describe the characteristics of non-numeric concepts cannot aggregate.

14.8. Line items

Line items contain a set of concepts which can be reported by an entity, they can contain values.

Line items are what amounts to a special type of axis or characteristic. Because the concepts within a set of line items can report fact values, they have data types such as string, monetary, etc. They may also have a balance type (debit or credit), a period type (as of a point in time, for some period, etc.), and a few other attributes.

14.9. Component

A **component** is a combination of a network and a table. A component is a set of facts which go together for some specific purpose. Because a network and table have undefined semantics, likewise a component must have undefined semantics.

> HINT: Taxonomies such as the US GAAP Taxonomy SHOULD define specific semantics for networks and tables. If such semantics were known, then the semantics of a component would be clear. Each reporting entity can, and generally does, have their scheme or approach to how they create the many pieces which make up their financial report. That is their scheme. Each scheme could be different. There are exactly three approaches to defining components: use only networks (and make all tables the same), use only tables (and make networks meaningless) or use both networks and tables. If an approach where tables are used, each table should be unique (have a unique name). Having one table have multiple meanings (i.e. polymorphic) causes issues with using financial report information.

14.10. Sub component (component block, disclosure block)

A **sub component** (component block, disclosure block) is a sub set of line items which have the same information model and go together for some specific purpose. A sub component is an abstract report element in that it is more of an idea for convenience than a necessary report element.

For example, the balance sheet has two sub components: "Assets [Roll Up]" and "Liabilities and Equity [Roll Up]".

> HINT: A table always has at least one sub component and may have any number of sub components.

14.11. Concept

A **concept** refers to a financial reporting concept or a non-financial concept which can be reported as a fact within a digital financial report. A concept is sometimes referred to as a concrete concept, as compared to an abstract concept (see next section).

Line items contain concepts organized within a component which have the same information model. Concepts can be concrete (meaning they can be reported) or abstract (meaning that they are never reported; they are only used to organize the concepts contained within a set of line items).

14.12. Abstract

An **abstract** refers to a concept which is used only for organizational purposes and can never be actually reported.

> HINT: The term abstract as it is being used here is NOT the same as the XML Schema abstract attribute.

14.13. Concept arrangement patterns

A **concept arrangement pattern** describes the organization or relation between concepts within a sub component.

Concepts are not interspersed randomly within a table; they have patterns. Said another way, concepts are organized into different concept arrangement patterns (or information models). A component block is a set of concepts which have the same concept arrangement pattern which are organized and used together for some specific purpose.

The common concept arrangement patterns include: hierarchy, roll up, roll forward, compound fact, adjustment, variance, complex computation, text block, and grid (a pseudo pattern).

Here is an example of line items which contain abstract and concrete concepts organized into a concept arrangement pattern:

- us-gaap:Nonmonetary Transaction [Line Items]
  - abc:Nonmonetary Transaction [Hierarchy]
    - us-gaap:Nonmonetary Transaction, Basis of Accounting for Assets Transferred
    - us-gaap:Nonmonetary Transaction, Name of Counterparty
    - us-gaap:Nonmonetary Transaction, Gain (Loss) Recognized on Transfer
    - us-gaap:Nonmonetary Transaction, Amount of Barter Transaction

The above screen shot shows the [Line Items] of a nonmonetary transaction. These [Line Items] are organized within the component "Nonmonetary Transaction [Hierarchy]". The component has four concepts. The [Table] and [Axis] are not shown.

14.14. Business rules

A **business rule** is a relation between reported facts. Business rules can be used to validate the values of facts contained within a report.

Taking the notion that concepts are not randomly placed within a set of line items further than just the concept relation model or information model; certain information models have financial integrity. A balance sheet always has "Assets" and "Liabilities and Equity". A balance sheet always balances. The line items of Assets will always foot. The line items of "Liabilities and Equity" will always foot. These characteristics, or the balance sheets financial integrity, are expressed using business rules.

HINT: Financial integrity exists within a table and also between tables.

14.15. Fact

A **fact** defines a single, observable, reportable piece of information contained within a financial report, or fact value, contextualized for unambiguous interpretation or analysis by one or more characteristics. Numeric fact values must also provide the additional traits "units" and "rounding" to enable appropriate interpretation of the numeric fact value. Facts may have zero or many parenthetical explanations which provide additional descriptive information related to the fact. Facts are sometimes referred to as a metric.

A fact could be numeric, non-numeric (i.e. strings), or narrative (i.e. Text Block).

Facts are an intersection of **axis**, **line items** (remember that line items are a special type of axis which express a concepts), and a **value**. The value of a reported fact is referred to as a fact value. A fact value has fact attributes if it is numeric. A fact may also have a **footnote**.

The characteristics of a fact are described by the **axis** collection. The concept is one characteristic of the fact. So, facts have values, they have an axis which describes its characteristics, and they have fact attributes which further describe the value. Numeric facts have an amount and non-numeric facts are made up of textual information. Narratives are basically XHTML (technically narratives are escaped XHTML which is converted by software to HTML).

Facts exist within a **fact table**. A **fact table** is simply a set of one or more facts.

14.15.1. Intersection with line items (concepts)

A **fact** is associated with a concept, they reference a concept within the set of **line items**.

14.15.2. Intersection with axis

Facts are associated with axis which articulate characteristics, they reference a set of axis within an implicit or explicit table.

> HINT: A fact will always have a "Reporting Entity [Axis]" and a "Period [Axis]" as they are required by the XBRL technical syntax. Because of this undesired calculation inconsistencies can exist in an SEC XBRL financial filing. See the appendix on the causes of calculation inconsistencies in the appendix.

14.15.3. Value

Facts have a value which can be numeric or non-numeric. An important non-numeric value type is a narrative or [Text Block] which is a fragment of escaped XHTML.

14.15.4. Fact traits

If the **fact** is numeric, it has two traits which describe additional information needed by numeric facts: **units** and **decimals** (rounding). **Units** provides information about this units of the numeric fact such as monetary, shares, or some other units. The **decimals** (rounding) provides information as to the number of decimal places to which the number is accurate, such as to the thousands, millions, billions, hundredths, etc.

14.16. Footnote (parenthetical explanation)

Facts may also have **footnotes** (parenthetical explanations, don't confuse this with notes to the financial statements) which provide addition information about the fact.

14.17. Integrity models

Relations exist within a [Table], for example a set of concepts can roll up into some total, concept relations models or information models describe these types of relationships within one [Table]. But relations can also exist between [Table]s.

Integrity models express the semantic relations between the components of on [Table] and the components of another [Table].

14.18. Flow patterns

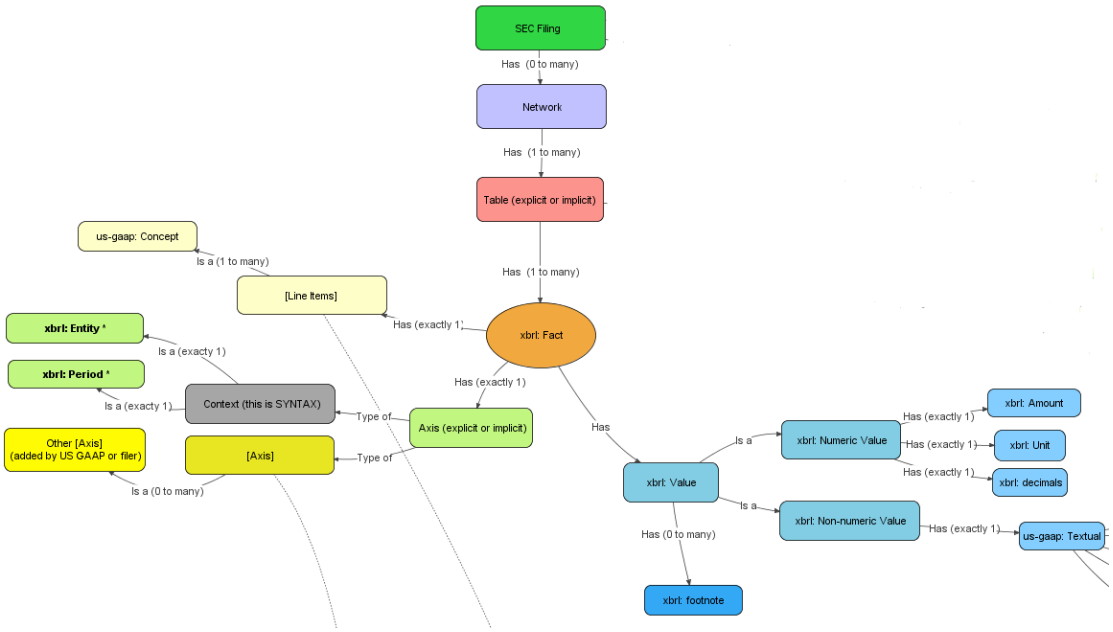
Flow is the notion of relations between components (networks/[Table]s) for the purpose of ordering or sequencing information contained in a digital financial report.

14.19. Semantic models

Semantic models add an additional layer of integrity to an integrity model specific to the domain for which information is expressed.

14.20. Summary visualization of report model

This graphic depicts what we have discussed thus far, showing the report elements for the model we have discussed and also showing the relationships between these report elements expressed as a mind map. Each of these report elements is represented as a box. The lines show the relationships between the report elements. The text on the line provides information about the relationship:



The relations between report elements will be expanded upon in the next section of this document.

You can find a complete version of this mind map of the logical model at this URL:

http://www.xbrlsite.com/2012/Library/TheoryPlusImplementation_v3.pdf

HINT: There are many different ways to depict this information, the most formal being UML (Uniform Modeling Language). UML is a standard way of depicting this information. However, we are using a less formal approach to articulating this information to make it easier for business readers to understand the relations. UML provides additional details, but is harder for business readers to understand.

14.21. Summary narrative of financial report model

A **digital financial report**, such as an SEC XBRL financial filing can be logically broken down into categories of pieces or **report elements**. These report elements can be categorized.

A **fact** defines a single, observable, reportable piece of information contained within a digital financial report, or fact value, contextualized for unambiguous interpretation or analysis by one or more characteristics.

Information, or facts reported, can be grouped. Groups or sets of information reported which go together for some specific purpose are called a **component**. Components can have one or many sub components (component block, disclosure block).

A component is expressed using networks and tables. A table can be organized within a network. **Networks** organize where **tables** show up in software applications which render information such as the SEC Interactive Data viewer application. Networks have numbers, a category, and a label. There are categories of networks: Document, Statement, Schedule, and Disclosure. The numbers within the network names determine the ordering of the networks within rendering software applications.

Tables are groupings of **facts** which appear in a financial report for some specific purpose. Facts within a table have similar characteristics. **Axes** articulate these characteristics. **Line items** are a special type of axis. Line items contain concepts. These **concepts** can describe **fact values** in a digital financial report.

The value of an axis is a **member**. Axis always has one or more domains which is its set of members. A domain may be broken down into one or more partitions. (US GAAP XBRL Taxonomy and SEC filings only allow ONE domain patrician.) There are two axis which must always exist: reporting entity and period. (Actually, if you count the concept there are three axis which must exist.)

Numeric values have two additional traits: units and decimals (or rounding). **Units** explain the units of a numeric value and **decimals** explain the rounding of a numeric value. Fact values may also have **footnotes** which provide additional descriptive information about a specific value or a set of values. **Traits** play no role in processing axis, they are traits of the fact and not characteristics.

Facts reported do not have random relationships, the relationships between facts have patterns, this is referred to as a **concept arrangement pattern** or an information model. A table may contain numeric concepts within **sub components** which have concept arrangement patterns such as **roll up**, **roll forward**, **adjustment**, **variance**, **complex computations**, etc. If the numeric information

has no relationship or only textual information is reported, the information model is simply a **hierarchy**. The **text block** information model is that of a narrative or prose and is reported as a block of HTML.

Likewise the members which make up the domain do not have random relations, the relations of an axis have patterns referred to as the **member arrangement pattern** or the domain partition aggregation model. Complete flat sets of members describe the characteristic of numeric concepts which can aggregate. Partial sets or domains whose members describe non-numeric concepts can never aggregate. Complete hierarchical sets are nested complete flat sets. Complex sets are other more complicated axis aggregation models.

Integrity models describe how the components of one table and the components of another table relate. **Semantic models** add domain specific integrity beyond a general integrity model. **Flow models** articulate an ordering or sequencing of the networks/tables within a digital financial report.

14.22. Digital financial report examples

The following are a number of examples which will provide additional explanation of how the report elements work together.

14.22.1. Simple example

Consider this example below which shows the "Document and Entity Information" network which contains the "Document and Entity Information" table, its axis, and its line items within the SEC XBRL Interactive Data viewer:

EDGAR ONLINE INC (Filer) CIK: 0001080224

Print Document View Excel Document

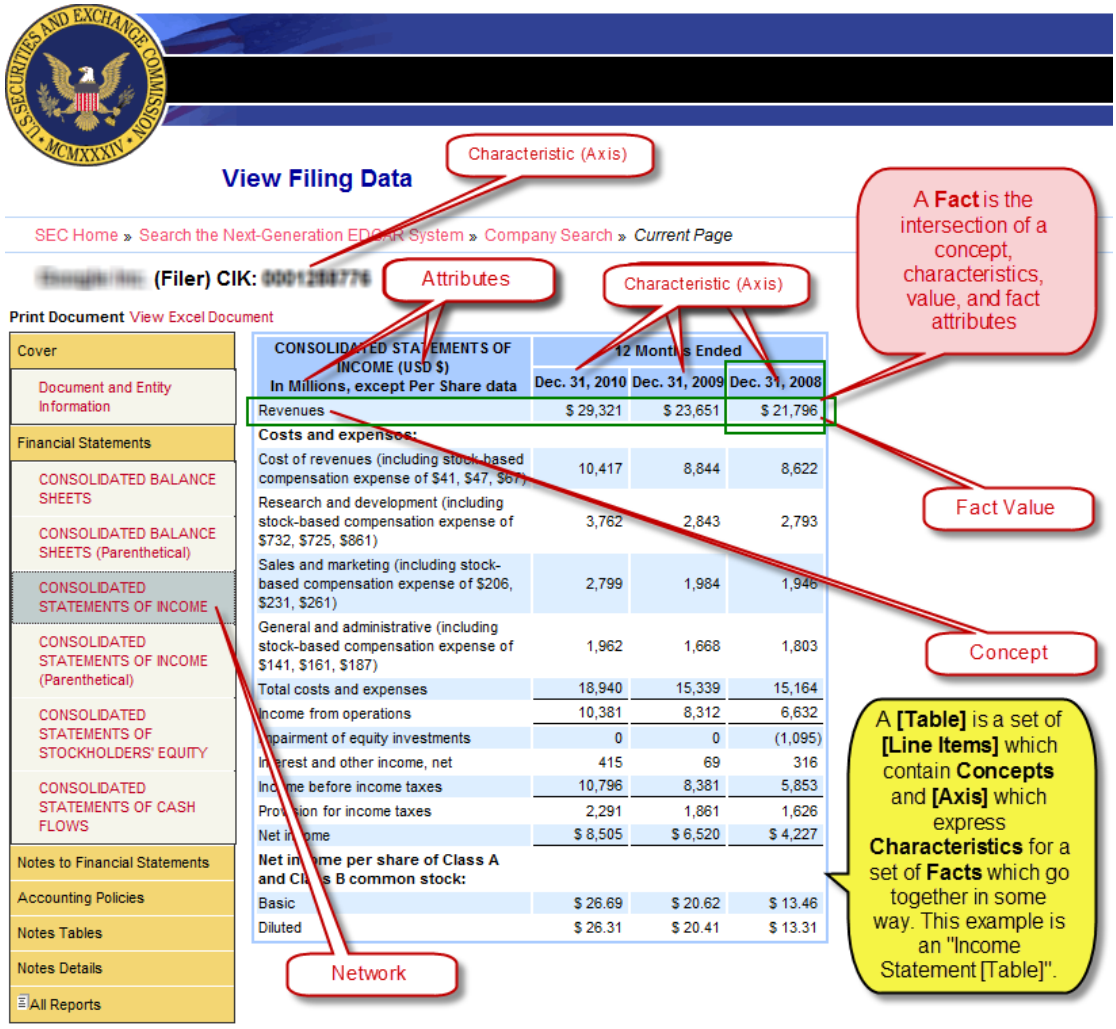
- Cover
- Document and Entity Information
- Financial Statements
- Notes to Financial Statements
- Notes Tables
- Notes Details
- All Reports

Document and Entity Information	9 Months Ended	
	Sep. 30, 2010	Nov. 12, 2010
Document Type	10-Q	
Amendment Flag	false	
Document Period End Date	2010-09-30	
Document Fiscal Year Focus	2010	
Document Fiscal Period Focus	Q3	
Trading Symbol	EDGR	
Entity Registrant Name	EDGAR ONLINE INC	
Entity Central Index Key	0001080224	
Current Fiscal Year End Date	--12-31	
Entity Filer Category	Smaller Reporting Company	
Entity Common Stock, Shares Outstanding		26,984,829

Note the last line of the report screenshot above, the right most column. The fact values "26,984,829" is associated with the concept which has the label "Entity Common Stock, Shares Outstanding" which is part of the line items of the Document and Entity Information [Table] which is contained in the "Document and Entity information" network. The fact is also associated with the axis period which has the value "Sep. 30, 2010" and the axis entity which has the value of 0001080224. The fact value is rounded to the nearest share and has the units of shares.

14.22.2. More complex example

This is another example with more complexity.



The more complex example shows most of the major terms used. Other terms are left out of here as to not overwhelm you. The visualization of the logical model which is next shows how every piece of the model is related to other pieces within the model.

Compare that to the HTML rendering of that table:

CONSOLIDATED STATEMENTS OF INCOME
(In millions, except per share amounts)

	Year Ended December 31,		
	2008	2009	2010
Revenues	$21,796	$23,651	$29,321
Costs and expenses:			
Cost of revenues (including stock-based compensation expense of $41, $47, $67)	8,622	8,844	10,417
Research and development (including stock-based compensation expense of $732, $725, $861)	2,793	2,843	3,762
Sales and marketing (including stock-based compensation expense of $206, $231, $261)	1,946	1,984	2,799
General and administrative (including stock-based compensation expense of $141, $161, $187)	1,803	1,668	1,962
Total costs and expenses	15,164	15,339	18,940
Income from operations	6,632	8,312	10,381
Impairment of equity investments	(1,095)	0	0
Interest and other income, net	316	69	415
Income before income taxes	5,853	8,381	10,796
Provision for income taxes	1,626	1,861	2,291
Net income	$ 4,227	$ 6,520	$ 8,505
Net income per share of Class A and Class B common stock:			
Basic	$ 13.46	$ 20.62	$ 26.69
Diluted	$ 13.31	$ 20.41	$ 26.31

And here is another view of the same information in a third party rendering tool, the Firefox browser add in for viewing XBRL based information:

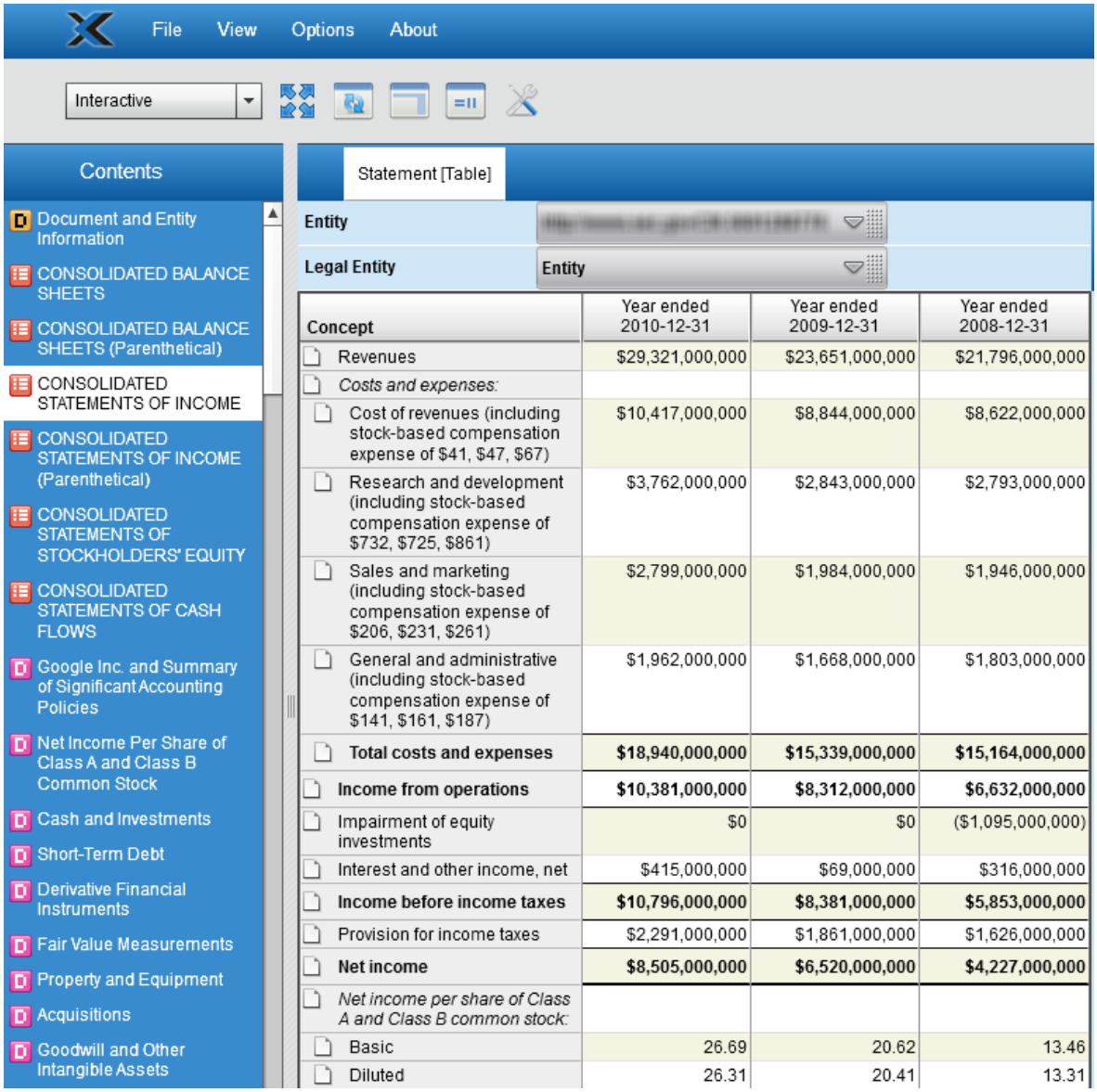
105 - Statement - CONSOLIDATED STATEMENTS OF INCOME

IDENTIFIER: 0001288776 - HTTP://WWW.SEC.GOV/C

LEGAL ENTITY [AXIS]: ENTITY [DOMAIN]

(IN THOUSANDS)			DATE	12 MONTHS ENDED 2008-12-31	12 MONTHS ENDED 2009-12-31	12 MONTHS ENDED 2010-12-31
UNIT	ITEM	NOTES				
USD	REVENUES			21,796,000	23,651,000	29,321,000
	COST OF REVENUES (INCLUDING STOCK-BASED COMPENSATION EXPENSE OF $41, $47, $67)			8,622,000	8,844,000	10,417,000
	RESEARCH AND DEVELOPMENT (INCLUDING STOCK-BASED COMPENSATION EXPENSE OF $732, $725, $861)			2,793,000	2,843,000	3,762,000
	SALES AND MARKETING (INCLUDING STOCK-BASED COMPENSATION EXPENSE OF $206, $231, $261)			1,946,000	1,984,000	2,799,000
	GENERAL AND ADMINISTRATIVE (INCLUDING STOCK-BASED COMPENSATION EXPENSE OF $141, $161, $187)			1,803,000	1,668,000	1,962,000
	TOTAL COSTS AND EXPENSES			15,164,000	15,339,000	18,940,000
	INCOME FROM OPERATIONS			6,632,000	8,312,000	10,381,000
	IMPAIRMENT OF EQUITY INVESTMENTS			(1,095,000)	0	0
	INTEREST AND OTHER INCOME, NET			316,000	69,000	415,000
	INCOME BEFORE INCOME TAXES			5,853,000	8,381,000	10,796,000
	PROVISION FOR INCOME TAXES			1,626,000	1,861,000	2,291,000
	NET INCOME			4,227,000	6,520,000	8,505,000
USD/SHARES	BASIC			0.01346	0.02062	0.02669
	DILUTED			0.01331	0.02041	0.02631

Here is another rendering of the same information using the XBRL Cloud free XBRL viewer browser application which likewise lets you pivot the information:



Concept	Year ended 2010-12-31	Year ended 2009-12-31	Year ended 2008-12-31
Revenues	$29,321,000,000	$23,651,000,000	$21,796,000,000
Costs and expenses:			
Cost of revenues (including stock-based compensation expense of $41, $47, $67)	$10,417,000,000	$8,844,000,000	$8,622,000,000
Research and development (including stock-based compensation expense of $732, $725, $861)	$3,762,000,000	$2,843,000,000	$2,793,000,000
Sales and marketing (including stock-based compensation expense of $206, $231, $261)	$2,799,000,000	$1,984,000,000	$1,946,000,000
General and administrative (including stock-based compensation expense of $141, $161, $187)	$1,962,000,000	$1,668,000,000	$1,803,000,000
Total costs and expenses	**$18,940,000,000**	**$15,339,000,000**	**$15,164,000,000**
Income from operations	**$10,381,000,000**	**$8,312,000,000**	**$6,632,000,000**
Impairment of equity investments	$0	$0	($1,095,000,000)
Interest and other income, net	$415,000,000	$69,000,000	$316,000,000
Income before income taxes	**$10,796,000,000**	**$8,381,000,000**	**$5,853,000,000**
Provision for income taxes	$2,291,000,000	$1,861,000,000	$1,626,000,000
Net income	**$8,505,000,000**	**$6,520,000,000**	**$4,227,000,000**
Net income per share of Class A and Class B common stock:			
Basic	26.69	20.62	13.46
Diluted	26.31	20.41	13.31

Here is a rendering of the same information using Edgar Online I-Metrix which uses Microsoft Excel as its rendering output format:

	A	B	C	D
1	I·Metrix by EDGAROnline			
2	**Name**		[illegible]	
3	**Symbol**		[illegible]	
4	**Form**		[illegible]	
5	Period Dates	1/1/2010 - 12/31/2010	1/1/2009 - 12/31/2009	1/1/2008 - 12/31/2008
6	CONSOLIDATED STATEMENTS OF INCOME			
7	Revenues	$29,321,000,000	$23,651,000,000	$21,796,000,000
8	*Costs and expenses:*			
9	Cost of revenues (including stock-based compensation expense of $41, $47, $67)	$10,417,000,000	$8,844,000,000	$8,622,000,000
10	Research and development (including stock-based compensation expense of $732, $725, $861)	$3,762,000,000	$2,843,000,000	$2,793,000,000
11	Sales and marketing (including stock-based compensation expense of $206, $231, $261)	$2,799,000,000	$1,984,000,000	$1,946,000,000
12	General and administrative (including stock-based compensation expense of $141, $161, $187)	$1,962,000,000	$1,668,000,000	$1,803,000,000
13	Total costs and expenses	$18,940,000,000	$15,339,000,000	$15,164,000,000
14	Income from operations	$10,381,000,000	$8,312,000,000	$6,632,000,000
15	Impairment of equity investments	$0	$0	-$1,095,000,000
16	Interest and other income, net	$415,000,000	$69,000,000	$316,000,000
17	Income before income taxes	$10,796,000,000	$8,381,000,000	$5,853,000,000
18	Provision for income taxes	$2,291,000,000	$1,861,000,000	$1,626,000,000
19	Net income	$8,505,000,000	$6,520,000,000	$4,227,000,000
20	*Net income per share of Class A and Class B common stock:*			
21	Basic	$26.69	$20.62	$13.46
22	Diluted	$26.31	$20.41	$13.31

Notice the similarities and differences between the SEC, Firefox, and XBRL Cloud XBRL viewer and Edgar Online I-Metrix applications.

15. Identifying Relations between Financial Report Model Elements

A list of report elements, by itself, is not sufficient to describe a model for a digital financial report. A digital financial report contains both things that exist within that model (things that exist, report elements) and relationships between those report elements (how they interact with one another).

In the prior section, Financial Report Model Elements, we discussed the elements which make up the digital financial report model. In this section we discuss the relations between those report elements in additional detail.

15.1. Overview or relations between report elements

As pointed out in the previous section, digital financial reports are made up of the following report elements: networks, tables, axes, members, line items, concepts, facts.

These report elements can be related:

- **Concept arrangement patterns**: relations between concepts
- **Member arrangement patterns**: relations between the members of a domain of an axis
- **Business rules**: relations between facts
- **Flow or sequence**: relations between financial report components
- **Integrity**: relations between concepts which exist within numerous components
- **Intersections**: general relation between report elements which may exist in more than one component and therefore can be leveraged for navigating between components of the digital financial report

All of these types of relations are important and we cover each in this section.

15.2. Concept arrangement patterns

The world is full of patterns and information technology engineers and architects leverage these patterns when trying to get a computer to do something effectively and efficiently for humans. Understanding the patterns which exist can help make both building and using software easier.

Business reports, including financial reports, have patterns. Another way of saying this is that financial reports are not random. There are not an infinite number of patterns in financial reporting.

The next section, *Business Reporting Use Cases*, introduces a set of approximately 30 financial reporting use cases collected over a number of years. That set of 30 business use cases was condensed from many, many different financial reporting use cases examined in order to understand how to model financial information using XBRL. These business use cases were also used within the USFRTF Patterns Guide which was created in order to help understand how to construct the US GAAP XBRL Taxonomy.

These 30 business use cases were distilled down further, basically to their essence. This distilled version is referred to here as a metapattern. Basically, every financial reporting use case follows one or a combination of these metapatterns. While it is hard to say if these metapatterns will cover 100% of all financial reporting use cases, it is hard to dispute that any of these 9 metapatterns.

The US GAAP Taxonomy Architecture refers to these metapatterns as *compact pattern definitions* and documents a number of these metapatterns in what it refers to as style guides. These style guides were never released publicly but they are referred to in the US GAAP Taxonomy Architecture. Everything within the US GAAP Taxonomy fits into one or a combination of these metapatterns.

Metapatterns explain the business semantics within a modelling of information expressed as an XBRL taxonomy. As such, these metapatterns can be said to express information models.

The following is a summary of the identified financial reporting related concept arrangement patterns.

15.2.1. Hierarchy

A **hierarchy** information model denotes a hierarchy of concepts with no numeric relations. If no numeric relations exist, then the information model of the component is a hierarchy. Basically, anything can be modelled as a hierarchy. It is the addition of additional relations, typically mathematical computations, which turns a hierarchy into some other metapattern.

Sample Company
December 31, 2010

Basis of Reporting

Praesent fringilla feugiat magna. Suspendisse et lorem eu risus convallis placerat. Suspendisse potenti. Donec malesuada lorem id mi. Nunc ut purus ac nisl tempus accumsan.

Trade receivables
Sed magna felis, accumsan a, fermentum quis, varius sed, ipsum. Nullam leo. Donec eros.

Inventories

Inventory valuation method
Cost

Description of components
Proin elit sem, ornare non, ullamcorper vel, sollicitudin a, lacus. Mauris tincidunt cursus est. Nulla sit amet nibh. Sed elementum feugiat augue. Nam non tortor non leo porta bibendum. Morbi eu pede.

Cost method
FIFO

Investments in securities
Etiam ipsum orci, gravida nec, feugiat ut, malesuada quis, mauris. Etiam porttitor. Ut venenatis, velit a accumsan interdum, odio metus mollis mauris, non pharetra augue arcu eu felis.

Bank borrowings
Ut ut risus nec nibh dictum posuere. Phasellus eleifend, diam vitae dapibus pulvinar, erat ligula auctor dui, eget congue justo lorem hendrerit tellus.

Provisions
Suspendisse vestibulum augue eu justo. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

15.2.2. Roll up

A **roll up** information model computes a total from a set of other concepts. This information model is commonly referred to a "roll up", or the equation A + B = C. All concepts involved in this information model have the same set of characteristics and all must be numeric.

Sample Company
December 31,
(thousands of dollars)

	2010	2009
Property, Plant, and Equipment, Net		
Land	5,347	1,147
Buildings, Net	244,508	366,375
Furniture and Fixtures, Net	34,457	34,457
Computer Equipment, Net	4,169	5,313
Other Property, Plant, and Equipment, Net	6,702	6,149
Property, Plant and Equipment, Net, Total	295,183	413,441

15.2.3. Roll forward

A **roll forward** information model reconciles the balance of a concept between two points in time. This information model is commonly referred to a "roll forward" or "movement analysis" or the equation: beginning balance + changes = ending balance. In this equation period [Axis] is as of two different points in time and the changes occur during the period between those two points in time.

Sample Company
December 31,
(thousands of dollars)

	2010	2009
Roll Forward of Land		
Land, Beginning Balance	1,147	1,147
Additions	1,992	400
Disposals	-193	-200
Translation difference	2,401	-200
Land, Ending Balance	5,347	1,147

15.2.4. Adjustment

An **adjustment** information model reconciles an originally stated balance to a restated balance, the adjustment being the total change, between two different report dates. An adjustment is similar to a roll forward in that it is a reconciliation,

however rather than the period [Axis] changing; it is the *Report Date [Axis]* which changes: originally reported balance + adjustment = restated balance.

Sample Company
December 31,
(thousands of dollars)

	2010	2009
Prior Period Adjustment		
Retained Earnings (Accumulated Losses), Originally Stated 2009	4,000	
Change in Accounting Policy	3,000	
Correction of an Error	-1,000	
Retained Earnings (Accumulated Losses), Restated 2009 Beginning Balance	6,000	

15.2.5. Variance

A **variance** information model reconciles some reporting scenario with another reporting scenario, the variance between reporting scenarios being the variance or changes. For example, a sales analysis which reconciles the concept sales for the reporting scenarios of actual and budgeted is a variance. The equation is: actual – budget = variance.

Sample Company
For Period Ending December 31, 2010

Concept	Actual	Budgeted	*Variance*
Sales	6,000	5,000	*1,000*
Cost of Goods Sold	4,000	3,000	*1,000*
Contribution Margin	1,000	2,000	*-1,000*
Distribution Costs	1,000	1,000	*0*

15.2.6. Complex computation

A **complex computation** information model can be thought of as a hierarchy plus a set of commutations between different concepts within that hierarchy which are challenging to model as the parent/child relations of a graph. The type of computations can vary significantly, thus the challenging in modelling. For example, the computation of earnings per share is a complex computation.

Sample Company
For Period Ended December 31,

	2010	2009
OTHER INFORMATION		
Earnings Per Share Components		
Net Income (Loss)	10,000,000	20,000,000
Weighted Average Common Shares	100,000,000	100,000,000
Earnings Per Share	0.10	0.20

15.2.7. Text block

A **text block** information model is an information model which contains, by definition, only one concept and that concept expresses what amounts to a narrative or prose as escaped HTML within that one concept. For example, the narrative associated with a set of accounting policies expressed as a list or a table presentation format is a text block. As there is only one concept, there can be no relations within the information model.

Duis fermentum

Sed mauris. Nulla facilisi. Fusce tristique posuere ipsum. Nulla facilisi. Aliquam viverra risus vitae ante. Sed rhoncus mi in wisi. Nullam nibh dui, molestie vitae, imperdiet non, ornare at, elit.

- Suspendisse accumsan, arcu vel ornare interdum, magna tellus porta mauris, in porta mi lacus sodales felis.
- Phasellus eleifend, diam vitae dapibus pulvinar, erat ligula auctor dui, eget congue justo lorem hendrerit tellus.
- Fusce gravida, ligula a placerat placerat, leo erat euismod lectus, et lacinia justo libero non pede.

DONEC PULVINAR NONUMMY ERAT

Etiam porttitor. Ut venenatis, velit a accumsan interdum, odio metus mollis mauris, non pharetra augue arcu eu felis. Ut eget felis. Mauris leo nulla, sodales et, pharetra quis, fermentum nec, diam.

15.2.8. Grid (not really a pattern)

A **grid** information model is a pseudo metapattern which uses the presentation characteristics of the columns and rows of a table to model information. Because the grid models presentation information and not business semantics, it cannot be considered a metapattern. However, the grid is included in this list because the US GAAP Taxonomy uses a grid information model to model the statement of changes in equity.

Sample Company
December 31,
(thousands of dollars)

	Common Stock	Additional Paid-in Capital	Retained Earnings (Accumulated Deficit)	Equity
Balance at December 31, 2009	150,000	50,000	200,000	400,000
Net Income (Loss)			200,000	200,000
Dividends			-100,000	-100,000
Common Stock Issued	25,000	25,000		50,000
Balance at December 31, 2010	175,000	75,000	300,000	550,000

15.2.9. Compound fact (not really a pattern)

A **compound fact** information model is characterized by the fact that some set of other concepts or some other information model exists for a set of characteristics expressed by one or more [Axis]. For example, the salary information for the directors of an entity is a compound fact. The salary information is made up of salary, bonuses, director fees which roll up into total salary and this set of compound facts can be expressed for any number of directors, the director being the characteristic or axis of the compound fact.

Sample Company
For Period Ending December 31, 2010

Director	Salary	Bonus	Director Fee	Options Granted, at Fair Value
pattern:JohnDoeMember	1,000	1,000	1,000	1,000
pattern:JaneDoeMember	1,000	1,000	1,000	1,000
frm:DirectorsAllMember	2,000	2,000	2,000	2,000

15.3. Member arrangement patterns

Member arrangement patterns explain how the members which make up a domain partition aggregate or how one member relates to another member. This section explains the different types of aggregation models. First we will help you understand exactly what we mean by a domain partition aggregation model.

15.3.1. Recall that Domains are Sets of Members

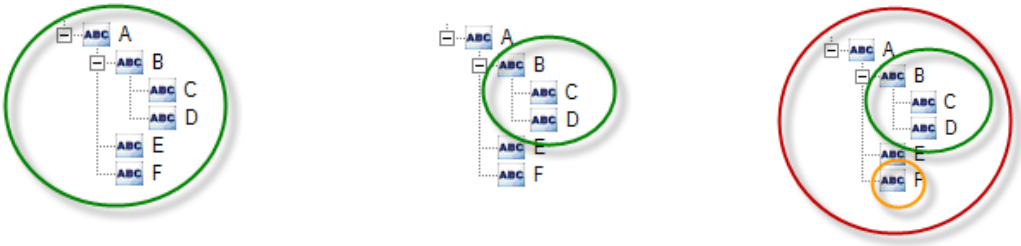
A **domain** is a cohesive set of members. For example, consider the screen shot below:

Sample Company
For Period Ending December 31,
(thousands of dollars)

	2010	2009	2008
Sales, all Business Segments, all Geographic Areas	32,038	35,805	32,465
Breakdown by Business Segment:			
Pharmaceuticals	20,181	18,150	15,275
Generics	2,433	1,973	1,823
Consumer Health	6,675	6,514	5,752
Other Segments	2,749	9,168	9,615

The screen shot shows a breakdown of sales by business segment and a total for sales for all business segments. This is an example of a domain partition aggregation. The concept "Sales" is part of a table which has the axis "Business Segments" with the member "All Business Segments" which represents a total of the other members Pharmaceuticals, Generics, Consumer Health, and Other Segments.

Consider the more general example:



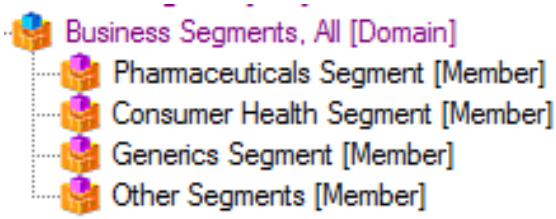
Assume that the above trees are the [Member]s of an [Axis]. In the diagram, A is a domain with members A, B, E, F, C and D. Also, B is a domain with the members B, C and D. And I also believe that F is a domain with the only member being itself.

15.3.2. Recall that Domains have Partitions

Domains have partitions. A partition is collectively exhaustive and mutually exclusive set of members within a domain. Partitions do not overlap. Give a set X, a partition is a division of X into non-overlapping and non-empty "parts" or "blocks" or "cells" that cover all of X. More formally, these "cells" are both collectively exhaustive and mutually exclusive with respect to the set being partitioned. Domains always has at least one partition and may have many partitions.

Referring back to the business segment breakdown example, the table might be modelled something like the following:

Looking specifically at the Business Segment [Axis] you see the following:



The Business Segment [Axis] has one partition or one breakdown of its set of members. It could have other breakdowns which would be expressed as another domain partition.

15.3.3. Aggregation

Intuitively, it is not a huge jump to make to believe that the sum of the [Member]s should add up to the total of all business segments, modelled above as the "Business Segments, All [Domain]." However, the breakdown is modelled in an XBRL taxonomy using business rules expressed as XBRL Formulas to articulate this aggregation to a software application.

The XBRL Dimensions specification does not address dimensional aggregation. As you can see by looking at the specification, there is no section in the XBRL Dimensions specification (http://www.xbrl.org/Specification/XDT-REC-2006-09-18+Corrected-Errata-2009-09-07.htm) which addresses dimensional aggregation.

15.3.4. Summary of Member Arrangement Patterns

While above we provided a very basic example to help you become familiar with the ideas which we want to discuss, aggregation is a bit more complex. Here is the spectrum of domain partition or member aggregation models:

Model	Description	Example
Partial set (or no aggregation)	A partial set is a set which is incomplete so it can never aggregate or a set which describes non-numeric concepts which could never aggregate. A set of numeric concepts which could be aggregated but the aggregated value is illogical or never used is considered a partial set.	A partial set of the classes of cash, a set which describes the accounting policies such as the depreciation method of useful lives of each class. Subsequent events (which are never aggregated) are a partial set. The aggregate value of the useful lives of PPE (a numeric value) is a partial set as the value is illogical.
Complete flat set (has numeric concept which aggregates)	A complete flat set is a set which is both complete and characterizes a numeric concept which can be mathematically aggregated. A complete flat set is similar to a [Roll Up] information model. The aggregation scheme is that the members of the list aggregate to the parent of those members. A complete flat set has no subdomains.	A value of all classes of property, plant and equipment and the value of each class of property, plant and equipment is a complete flat set.
Complete hierarchical set	A complete hierarchical set is a set comprised of a collection of complete flat sets, basically a domain which has one or more subdomains. A business rule will always describe the aggregation scheme.	A breakdown of revenues by geographic area whereby the domain of geographic areas has a hierarchy of geographic regions such as "North America" which makes up one hierarchy and countries such as "United States" and "Canada" which comprise a second hierarchy nested within the first hierarchy.
Complex set	A complex set is a set which has some other set of complex relations or set of subdomains expressed within a business rule.	Some complex disclosure.

There is no "standard" XBRL terminology at this time for these types of relations, all the terminology is taxonomy specific. This is because XBRL Dimensions does not address aggregation of domain members.

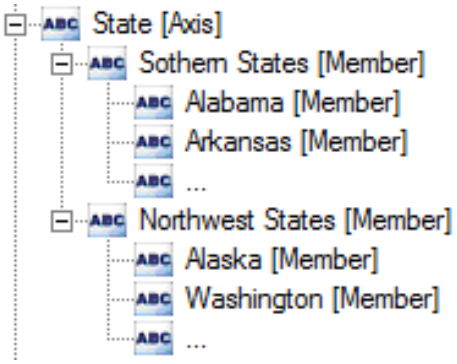
However, although XBRL Dimensions does not define how members of a domain aggregate or if they aggregate at all, you can use XBRL Formulas to clearly define such aggregation if they exist. This XBRL Formulas definition both articulates the

aggregation scheme and can also be used to validate XBRL instances against that scheme. XBRL Formulas can handle quite complex models.

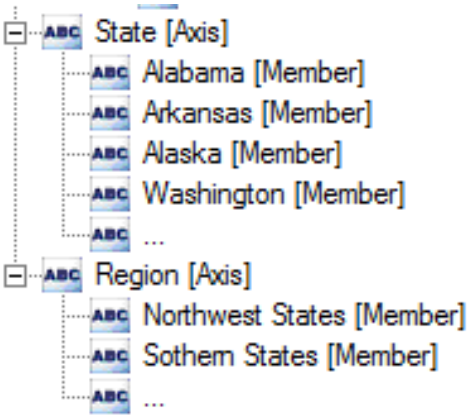
But, since the SEC does not allow XBRL Formulas to be submitted with an SEC XBRL filing, these filings can have aggregation schemes which are inconsistent with aggregation schemes you may come up with or different than how you might interpret the XBRL taxonomy. SEC XBRL filers can still create a valid scheme of aggregation, test any XBRL instances created against it in their SEC XBRL filing but not submit that XBRL Formula set with their SEC XBRL filing. One way or another, SEC XBRL filers should prove that their XBRL instances do in fact follow their defined scheme by validating their XBRL instance.

15.3.5. Modelling Options Impact Aggregation Models

How things are modelled impacts the aggregation models. An example will help your understanding. Consider how one might model the domain of US states:



An alternate approach to modelling this information is to not use one axis as was done above, but rather to use two [Axis], one for the state and another for the region:



There is not necessarily one right or wrong answer here; how you would model your business use case depends on the dynamics of what it is you are modelling. The primary point I am making here is that if there are multiple ways to model the same information; then what criteria do you use to determine the most appropriate modelling approach?

15.3.6. Intersections Between Tables

[Table]s may intersect with one or more other [Table]s, sharing specific facts between those [Table]s. When a fact is shared between [Table]s the characteristics of the fact may be different in each [Table]. For example consider the following:

	2010	2009
Sales, all Business Segments, all Geographic Areas	32,038	35,805
Breakdown by Business Segment:		
Pharmaceuticals	20,181	18,150
Generics	2,433	1,973
Consumer Health	6,675	6,514
Other Segments	2,749	9,168
Breakdown by Geographic Area:		
North America	10,214	12,649
Europe	11,901	10,374
Asia	5,639	4,371
Other regions	4,284	8,411

Sales are reported in the information above. Sales are broken down by business segment and by geographic area. The totals for each breakdown are the same. Total sales would also be reported within the income statement where reported information is the total of all business segments and all geographic areas; but those characteristics are not explicitly stated on the income statement.

The characteristics of reported facts therefore have to morph between different [Table]s which have different characteristics. This is handled using "dimension defaults". This will be discussed later.

15.3.7. Whole-part relations

Characteristics can represent a whole or some part of a whole. Parts may be related in different ways. The following is a summary of subclasses of whole-part types of relations which may, or may not, be applicable to financial reporting. Other subclasses of whole-part relations may exist.

- **Component-integral object**: Indicates that a component contains some integral object. For example, the component handle is part of the integral object cup; wheels are a component part of a car; a refrigerator is a component of a kitchen.
- **Member-collection**: Indicates that some member is part of some collection. For example a ship is part of a fleet. Or, a subsidiary is part of an economic entity.
- **Portion-mass**: Indicates that some portion is part of some mass. For example a slice is part of a pie.
- **Stuff-object**: Indicates that some "stuff" is part of some object. For example steel is part of a car.
- **Feature-activity**: Indicates that some feature is part of some activity. For example the feature "paying" is part of the activity "shopping".
- **Place-area**: Indicates that some physical place is part of some area. For example the place "Everglades" is part of the area "Florida".

15.4. Report component arrangement patterns

Flow is the notion of relations between networks and/or [Table]s for the purpose of ordering or sequencing information contained in a digital financial report. Creating schemes for generating the desired flow of information contained by a digital financial report can be impacted by metadata available.

While there are many possible approaches for articulating flow metadata, the approaches considered are those which do not add new approaches to articulating required metadata; rather only approaches which use existing metadata or standard forms of expressing metadata are considered.

Also "pixel perfect" formatting of information is not the target. The target is the organization of groups or fact tables of information.

15.4.1. Metadata Constraints Impacting Ordering

Certain metadata is required by the XBRL technical syntax. Other metadata is determined by how a taxonomy is expressed. The following is a summary of the constraints imposed by approaches used to express metadata within a taxonomy and how those constraints impact ordering.

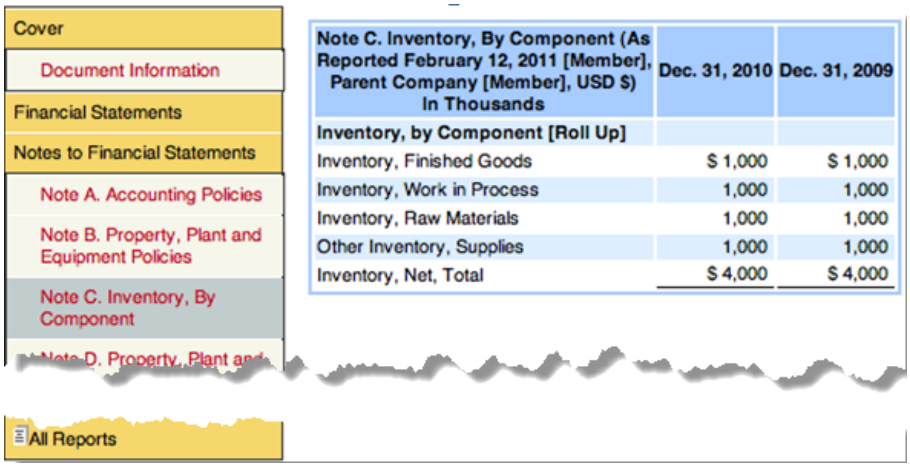
- **Networks** – Networks are always required to be unique so as such, networks can always be used to order a taxonomy. However, if networks alone are used many times not enough granularity is achievable. Also networks cannot be articulated within a hierarchy.
- **Networks plus Non-unique Tables** – Tables can be used with networks to order information. However, depending on whether the tables are expressed are unique governs the role a network must play in allowing a table to be specifically identified.
- **Unique Tables** – If every table within a taxonomy is unique, then networks no longer need to be relied upon to uniquely identify and locate a table, the table alone will allow such identification.

15.4.2. Ordering/sequencing examples

The following are a number of ordering/sequencing examples which provide details about available options.

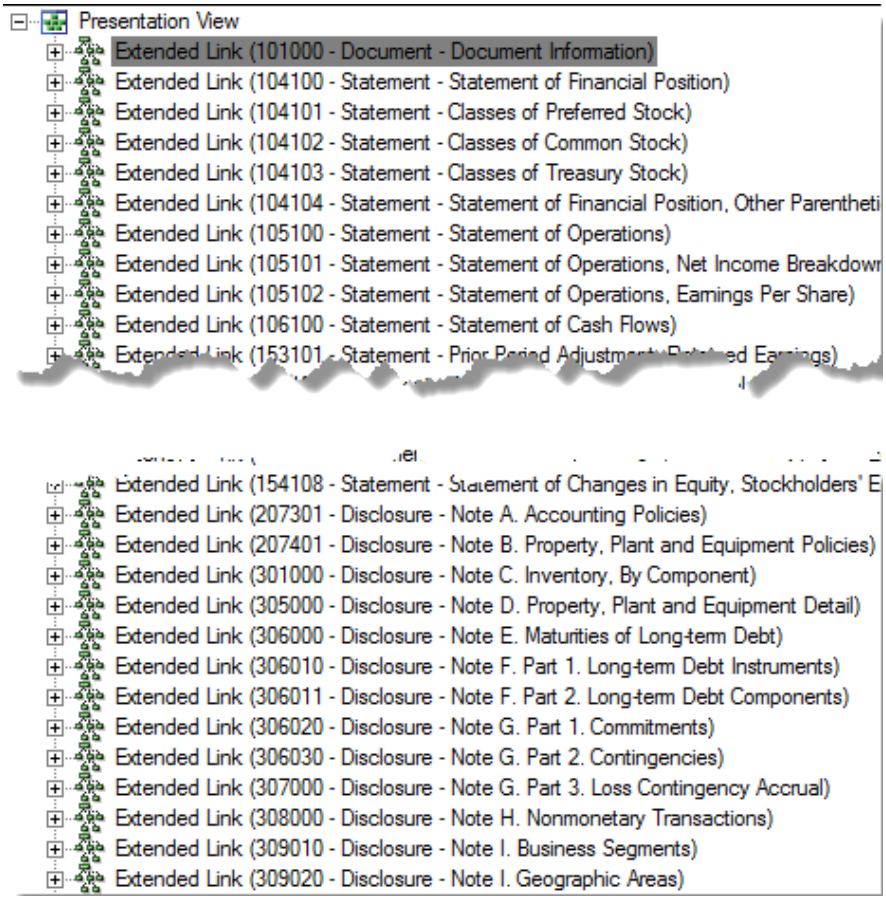
15.4.3. Networks with numbers and categories

One example of using networks to order or sequence the contents of a digital financial report can be seen in how the SEC achieves sequencing. Consider the following example:



Note C. Inventory, By Component (As Reported February 12, 2011 [Member], Parent Company [Member], USD $) In Thousands	Dec. 31, 2010	Dec. 31, 2009
Inventory, by Component [Roll Up]		
Inventory, Finished Goods	$ 1,000	$ 1,000
Inventory, Work in Process	1,000	1,000
Inventory, Raw Materials	1,000	1,000
Other Inventory, Supplies	1,000	1,000
Inventory, Net, Total	$ 4,000	$ 4,000

The above is a fragment of a model financial report rendered within the SEC interactive data previewer. This is the taxonomy which drives that view will each network collapsed so that you are looking at a list of the networks in the taxonomy:



Each network can be broken into three components which drive the sequencing of the rendering framework:

- **Number** such as "101000" within the first network.

- **Category** such as "Document", "Statement" or "Disclosure"
- **Description** or other part of the networks definition.

The category is used to put the different networks into one of the yellow categories in the SEC example, the number determines the order within the category, and the balance of the description is the label that a user sees.

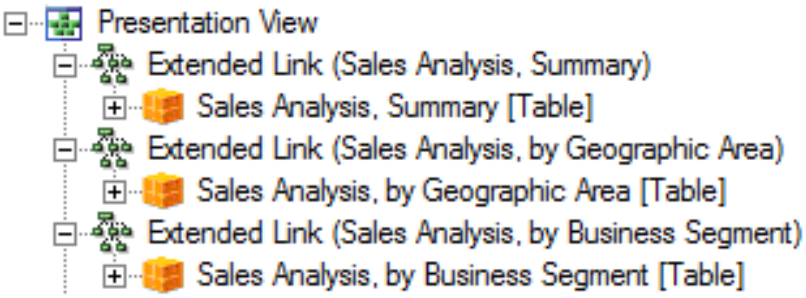
This approach is workable, but it means that all information must be broken out by network and anything smaller than the network itself cannot be broken out any further. For example, table information is not used for rendering information at all.

You can examine this in more detail by examining the reference or model implementation of an SEC XBRL financial filing.

15.4.4. Tables organized into a list

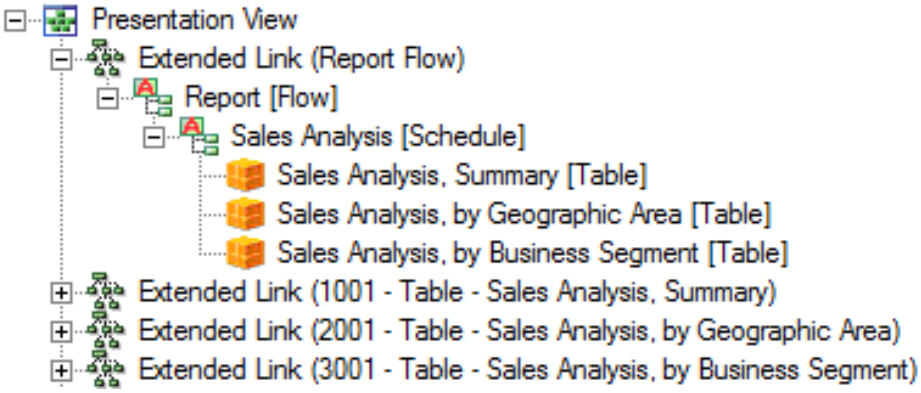
Another approach to articulating sequencing information can be seen by comparing the *Pivot Table* business use case with the *Flow* business use case.

Consider the screen shot below of the Pivot Table business use case:



There are three networks with three tables. Each network and table is unique. Suppose you wanted to articulate the ordering you would prefer for working with this information, how would you do that? You could request the information in the physical order in which it exists within the XBRL taxonomy or you could request the information in alphabetical order, that is about all the options you might have.

Now consider the *Flow* business use case below. The this taxonomy has a network called "Report Flow". Within that network, a hierarchy of the [Table]s which exist in the taxonomy for this financial report is provided.



As such, a software application can read that hierarchy and use it within the application to show the summary first, the geographic table second, and the business segment third.

Alternatively, the numbering of the network could be used to achieve the same goal as with the SEC example.

The [Table]s alone can be used, and the networks totally ignored, because each table is unique. By contrast, if each table were called "Sales Analysis, Summary [Table]", then to identify which [Table] you were looking for, you would also need to rely on the network.

15.4.5. Notion of the "Implied [Table]"

In the section which discusses the report elements which make up a digital financial report we explain that everything within a digital financial report exists within a [Table], be that [Table] explicitly articulated using the "[Table]" report element, or the table is implied.

Basically, everything expressed within a network which is not contained within some explicit [Table] can be thought of existing within a pseudo or implicit table called "No Table [Table]". Because you might have more than one "No Table [Table]", you must rely on the network to uniquely identify which "No Table [Table]" you would like to work with. As such, using implicit tables requires you to work with tables just as though you created non-unique tables.

15.4.6. The "Statement [Table]"

Another approach to defining [Table]s can be seen by examining the "Statement [Table]" within the US GAAP Taxonomy or even better, the "Hypercube [Table]" of the FINREP taxonomy.

The FINREP taxonomy took the most extreme route using one [Table] and one [Table] only throughout their entire taxonomy. They did this to specifically push all semantics of the meaning of a group of information onto the network which contains the hypercube. One can be sure that the network describes the information 100% of the time because (a) each [Table] is called exactly the same thing and (b) because each network could only possibly contain one [Table] because using the same [Table] name within a network would cause modelling conflicts (and remember, all [Table]s have the same name). The bottom line here is that the network carries all semantics for describing the information, there is no confusion.

By contrast, the US GAAP Taxonomy has the "Statement [Table]" which is used on the balance sheet, the income statement, the cash flow statement, and the statement of changes in equity. As such, one can only know which "Statement [Table]" you are working with by using the network.

Further, most but not all other [Table]s in the US GAAP Taxonomy are unique. What is more, not everything is modelled as an explicit [Table] and therefore there are many "No Table [Table]s" (see the preceding section).

15.4.7. Which Approach is Best?

All this distils down into three possible options:

- **Use explicit unique [Tables]**. This option works well, and in fact it is the option which I believe is the most reasonable. By taking this approach you

can ignore networks altogether, relegating networks to the role of syntax needed only for avoiding modelling conflicts. And because you can ignore the network, you can be sure the [Table] describes the information set and each [Table] being unique, each information set is unique.

- **Use explicit but only one [Table] for everything**. This option works well also because it is clear that the network carries all semantics for describing a set of information. The down side is that you have to create metadata such as the "number" and "category" used by the SEC to help organize those networks.
- **Mixed model**. If [Tables] are not unique and if [Table]s are not explicit (i.e. you have "No Table [Table]"s), you have to rely on both networks and tables to identify which information you need to work with. This can be both cumbersome for software and for users. A mixed model such as this does not appear to make much sense and should be avoided, all things considered.

There are no real benefits of having [Table]s names which can be used in more than one place, yet there are significant benefits of unique [Table] names.

15.5. Integrity models

Relations exist *within* a [Table], for example a set of concepts can roll up into some total, information models describe these types of relationships within one [Table]. But relations can also exist *between* [Table]s.

Integrity models express the semantic relations between the components of one [Table] and the components of another [Table]. [Table]s within an information set, be that information set within one financial report or across many financial reports you are comparing have relations. Proper relations makes things easier, improper relations make things harder. Modeling business information with these relations intact give your financial report the proper integrity.

Many times when modelers think they have modeling choices, you actually don't have as many choices as you might believe you have. The way a modeler thinks that XBRL might work has no bearing in the process of modeling business information. XBRL works as XBRL works, no one can change that. If you could, then what good what that type of standard be? Decisions on how to model information must be based on the model which already surrounds the information you are modeling, the other model components the information you are modeling must relate to, the business rules (XBRL Formulas) which prove the model works, and other such considerations. Not providing the business rules and then believing the model works is a far too common mistake.

While the metapatterns and business use cases are helpful in that they are small, focused examples of specific modeling situations, it is also necessary to understand how one [Table] relates to another [Table]. The purpose of the comprehensive example is to do just that. See the next section.

Note that this discussion is *not* about where information needs to be presented from a financial reporting perspective, that is not relevant to this discussion. This discussion is about how information is related.

15.5.1. Facts only exist in fact tables

A fact table is simply defined as a set of facts which go together. A fact can only exist within the framework of a fact table, facts never exist in isolation. There are two mechanisms for grouping facts into a fact table: networks and [Table]s.

The XBRL technical syntax defines the notion of a fact. An XBRL instance is "a bag of facts". All facts have a context. The XBRL technical syntax allows facts to be filtered using the mechanism of a network. The XBRL Dimensions technical specification defines another method of establishing a set of facts, the hypercube which we are referring to as a [Table].

There are never conflicts between networks and hypercubes. Hypercubes filter facts using dimensions. The entity and period dimensions are not filtered by hypercubes.

15.5.2. Notion of relations between [Table]s

The following is a list of the spectrum of how one [Table] can be related to another [Table] within a digital financial report:

- **[Table]s which are unrelated** – a [Table] has no relation to any other [Table].

- **[Table]s related by [Line Items]** – a [Table] shares one or more [Line Items] concept with another [Table].
- **[Table]s related by [Axis]** – a [Table] shares one or more [Axis] with another [Table].
- **[Table]s related by both [Line Items] an and by [Axis]** – a [Table] shares both [Line Items] and [Axis] with another [Table].

Examples which will be provided in a moment will make the differences between the categories on the list easier to see.

15.5.3. Notion of summary and detail related [Table]s

[Table]s which are related could fall into one of the following categories:

- **Summary [Table]s** – concepts within summary [Table]s are aggregates of information or totals.
- **Detail [Table]s** – concepts within detail [Table]s provide a number of the same concepts, differentiated using either concepts or by using [Member]s of an [Axis].

15.5.4. Member arrangement patterns

Recall from the prior section which discussed member arrangement patterns which explains how members of a domain within an [Axis].

15.5.5. Pulling relations and summary/detail together using examples

Examples help show the differences between the different permutations and combinations of relationships between [Table]s. Here we show such examples.

15.5.5.1. No relations

An example of no relations is the document information of the comprehensive example. The relations can be seen here:

1041	**VA, Part 1: Document Information**	[Network]		
1042	**Document Information [Table]**	[Table]		
1043	**Legal Entity [Axis]**	[Axis]		
1044	Consolidated Entity [Member]	[Member]		
1045	**Report Date [Axis]**	[Axis]		
1046	Reported as of March 18, 2011 [Member]	[Member]		
1047	**Document Information [Line Items]**	[Line Items]		
1048	Document Information [Hierarchy]	[Abstract]		
1049	Document Title	[Concept] Text/String	For Period	
1050	Document Date	[Concept] Date	For Period	
1051	Document Identifier	[Concept] Text/String	For Period	
1052	Document Description	[Concept] Text/String	For Period	
1053	Document Creator	[Concept] Text/String	For Period	
1054	Document Language	[Concept] Text/String	For Period	

While the Document Information [Table] is related to other [Table]s via the Legal Entity [Axis] and the Report Date [Axis] it does point out the notion of no relations. The [Line Items] of the Document Information [Table] are found in no other place in the comprehensive example digital financial report.

The Document Information [Table] has two other [Axis] where it is related to other tables: the Reporting Entity [Axis] and the Period [Axis], both of which are required

on all [Table]s. Going further with this is an advanced discussion which we will not get into here. Just realize that this relation exists.

15.5.5.2. Detail/summary related using [Line Items]

Consider the following balance sheet fragment followed by the disclosure of the details of Cash and Cash Equivalents in the notes to the financial statement:

	As of December 31,	
	2010	2009
ASSETS		
Current Assets		
Cash and Cash Equivalents	1,000	1,000
Receivables, Net of allowance of 1,000 and 1,000 in 2010 and 2009, respectively	1,000	1,000
Inventory	1,000	1,000
Prepaid Expenses	500	500
Investments, at Cost	500	500
Other Assets, Current	1,000	1,000

Details of Cash and Cash Equivalents

	As of December 31,	
	2010	2009
Cash, Unrestricted	250	250
Cash, Restricted	250	250
Petty Cash	250	250
Other Cash and Cash Equivalents	250	250
Total	1,000	1,000

The balance sheet can be seen as the summary table which contains the aggregate of Cash and Cash Equivalents. The disclosure which provides a breakdown of the components of Cash and Cash Equivalents is the detail. The intersection between these two items is the total of Cash and Cash Equivalents which appears on both the summary and in the detailed breakdown.

Here is a modelling of Cash and Cash Equivalents on the balance sheet followed by a modelling of the detailed breakdown from the disclosures:

16	**BA, Part 1: Balance Sheet**	[Network]		
17	**Balance Sheet [Table]**	[Table]		
18	**Legal Entity [Axis]**	[Axis]		
19	Consolidated Entity [Member]	[Member]		
20	**Report Date [Axis]**	[Axis]		
21	Reported as of March 18, 2011 [Member]	[Member]		
22	**Reporting Scenario [Axis]**	[Axis]		
23	Actual [Member]	[Member]		
24	**Balance Sheet [Line Items]**	[Line Items]		
25	Assets [Roll Up]	[Abstract]		
26	Assets, Current [Roll Up]	[Abstract]		
27	Cash and Cash Equivalents	[Concept] Monetary	As Of	Debit
28	Receivables, Net, Current	[Concept] Monetary	As Of	Debit
29	Inventory	[Concept] Monetary	As Of	Debit
30	Prepaid Expenses	[Concept] Monetary	As Of	Debit
31	Investments, at Cost	[Concept] Monetary	As Of	Debit
32	Other Assets, Current	[Concept] Monetary	As Of	Debit
33	Documentation for Shares	[Concept] Monetary	As Of	Debit
34	Assets, Noncurrent [Roll Up]	[Abstract]		

1	**JB, Part 2: Cash and Cash Equivalents, Details**	[Network]		
2	**Cash and Cash Equivalents, Details [Table]**	[Table]		
3	**Legal Entity [Axis]**	[Axis]		
4	Consolidated Entity [Member]	[Member]		
5	**Report Date [Axis]**	[Axis]		
6	Reported as of March 18, 2011 [Member]	[Member]		
7	**Reporting Scenario [Axis]**	[Axis]		
8	Actual [Member]	[Member]		
9	**Cash and Cash Equivalents, Details [Line Items]**	[Line Items]		
10	Cash and Cash Equivalents [Roll Up]	[Abstract]		
11	Cash, Unrestricted	[Concept] Monetary	As Of	Debit
12	Cash, Restricted	[Concept] Monetary	As Of	Debit
13	Petty Cash	[Concept] Monetary	As Of	Debit
14	Other Cash and Cash Equivalents	[Concept] Monetary	As Of	Debit
15	Cash and Cash Equivalents, Total	[Concept] Monetary	As Of	Debit

Note that Cash and Cash Equivalents is not only a concept in both locations, but it is actually the same concept which shows up in both [Table]s. Note that the [Axis] of both tables are the same.

You can get more information about this modelling approach by examining the *Simple Roll Up* business use case.

What is going on in this example may not yet seem obvious. However, when it is compared to the next approach what we are trying to explain will become more clear.

15.5.5.3. Detail/summary related using [Member]s of an [Axis]

Consider the following balance sheet fragment which shows Property, Plant and Equipment, Net:

Noncurrent Assets			
Property, Plant and Equipment, Net			
Land		1,000	1,000
Buildings, Net		1,000	1,000
Furniture and Fixtures, Net		1,000	1,000
Other Property, Plant, and Equipment, Net		1,000	1,000
	Property, Plant, and Equipment, Net	4,000	4,000
Investment in Affiliates		0	0
Other Assets, Noncurrent		3,000	1,000

One approach to modelling this information is to follow the approach used in the section above, modelling each class of Property, Plant and Equipment, Net as a concept as shown below:

19	Assets, Non[illegible]t [Roll Up]	[Abstract]		
20	Property, Plant, and Equipment, Net [Roll Up]	[Abstract]		
21	Land	[Concept] Monetary	As Of	Debit
22	Buildings, Net	[Concept] Monetary	As Of	Debit
23	Furniture and Fixtures, Net	[Concept] Monetary	As Of	Debit
24	Other Property, Plant, and Equipment, Net	[Concept] Monetary	As Of	Debit
25	Property, Plant, and Equipment, Net, Total	[Concept] Monetary	As Of	Debit
26	Investment in Affiliates	[Concept] Monetary	As Of	Debit

However, an alternative approach is to model each class of Property, Plant, and Equipment as a [Member] of an [Axis] which can be seen below:

1	**Property, Plant, and Equipment, by Component**	[Network]		
2	**Property, Plant and Equipment, by Component [Table]**	[Table]		
3	**Legal Entity [Axis]**	[Axis]		
4	Consolidated Entity [Member]	[Member]		
5	**Class of Property, Plant and Equipment [Axis]**	[Axis]		
6	All Classes of Property, Plant and Equipment [Member]	[Member]		
7	Land [Member]	[Member]	For Period	
8	Buildings [Member]	[Member]	For Period	
9	Furniture and Fixtures [Member]	[Member]	For Period	
10	Computer Equipment [Member]	[Member]	For Period	
11	Other Property, Plant and Equipment [Member]	[Member]	For Period	
12	**Property, Plant and Equipment, by Component [Line Items]**	[Line Items]		
13	Property, Plant and Equipment, Net [Hierarchy]	[Abstract]		
14	Property, Plant and Equipment, Net	[Concept] Monetary	As Of	Debit

Above you can see that each class of Property, Plant and Equipment is modelled as a [Member] of the [Axis] Class of Property, Plant and Equipment [Axis].

You can examine this model more closely by taking a look at the business use case *Classes*. Contrast that to the business use case *Simple Roll Up*.

Continuing on with the examples will further reveal the pros and cons of different alternative modelling options.

15.5.5.4. Related by [Axis] and [Members]

The following two fragments of policies and disclosures will help understand one very significant difference between modelling details using [Line Items] and concepts as contrast to modelling details leveraging an [Axis] and [Member]s. Consider these policies and disclosures of Property, Plant and Equipment:

Property, Plant and Equipment Policies

Class	Valuation Basis	Depreciation Method	Estimated Useful Life
Land	Mauris tincidunt cursus est	NA	NA
Buildings	Sed dapibus venenatis ipsum	Etiam porttitor	20 years
Furniture and Fixtures	Nunc congue	Maecenas tincidunt	10 years
Computer Equipment	Suspendisse potenti	Maecenas tincidunt	5 years
Other	Phasellus eleifend	Maecenas tincidunt	5 years

Property, Plant, and Equipment, Net, Components

	2010	2009
Land	5,347	1,147
Buildings, Net	244,508	366,375
Furniture and Fixtures, Net	34,457	34,457
Computer Equipment, Net	4,169	5,313
Other Property, Plant, and Equipment, Net	6,702	6,149
Property, Plant and Equipment, Net, Total	295,183	413,441

Here you can see two things. First, Property, Plant and Equipment has multiple sets of information expressed in different areas of a financial report and second, that the presentation of the information looks different.

Here is the modelling of both the polices and breakdown of Property, Plant and Equipment:

1	**Property, Plant, and Equipment, Policies**	[Network]		
2	**Property, Plant and Equipment, Policies [Table]**	[Table]		
3	**Legal Entity [Axis]**	[Axis]		
4	Consolidated Entity [Member]	[Member]		
5	**Class of Property, Plant and Equipment [Axis]**	[Axis]		
6	All Classes of Property, Plant and Equipment [Member]	[Member]		
7	Land [Member]	[Member]		
8	Buildings [Member]	[Member]		
9	Furniture and Fixtures [Member]	[Member]		
10	Computer Equipment [Member]	[Member]		
11	Other Property, Plant and Equipment [Member]	[Member]		
12	**Property, Plant and Equipment, Policies [Line Items]**	[Line Items]		
13	Property, Plant and Equipment, Policies [Hierarchy]	[Abstract]		
14	Valuation Basis	[Concept] Text/String	For Period	
15	Depreciation Method	[Concept] Text/String	For Period	
16	Estimated Useful Life	[Concept] Text/String	For Period	

1	**Property, Plant, and Equipment, by Component**	[Network]		
2	**Property, Plant and Equipment, by Component [Table]**	[Table]		
3	**Legal Entity [Axis]**	[Axis]		
4	Consolidated Entity [Member]	[Member]		
5	**Class of Property, Plant and Equipment [Axis]**	[Axis]		
6	All Classes of Property, Plant and Equipment [Member]	[Member]		
7	Land [Member]	[Member]		
8	Buildings [Member]	[Member]		
9	Furniture and Fixtures [Member]	[Member]		
10	Computer Equipment [Member]	[Member]		
11	Other Property, Plant and Equipment [Member]	[Member]		
12	**Property, Plant and Equipment, by Component [Line Items]**	[Line Items]		
13	Property, Plant and Equipment, Net [Hierarchy]	[Abstract]		
14	Property, Plant and Equipment, Net	[Concept] Monetary	As Of	Debit

Common between the two models is the Class of Property, Plant and Equipment [Axis]. That [Axis] can be used to "glue" the two [Table]s together, using both the disclosure of the balances of each class of Property, Plant and Equipment and the policies.

If only [Line Items] were used to model both the balances and disclosures, basically not using the [Axis], one would simply repeat the [Line Item] for each class; for example creating "Land, Valuation Basis", "Buildings, Valuation Basis", and so on. Two things would result. First, a much larger taxonomy and second, no connection between for example, "Buildings, Valuation Basis", "Buildings, Depreciation Method", "Buildings, Estimated Useful Life", and "Buildings, Net". They may seem connected to a human due to the common term "Buildings"; but a computer could not formally make this connection. Hacks could be employed to attempt to create a connection using the common term "Buildings", but it would be exactly that, a hack.

To examine the detailed taxonomies and instances in more detail, see the *Class Properties* business use case.

15.5.5.5. Detail/summary related using [Members] of an [Axis] with properties

We want to now bring the concept of "properties" into clearer focus. Consider this example of information about the classes of common stock:

Classes of Common Stock

Class	Par Value	Share Subscriptions	Shares Authorized	Shares Issued	Shares Outstanding	Amount 2010	Amount 2009
company:ClassACommonStockMember	1	10000	10000	10000	3000	500	500
company:ClassBCommonStockMember	1	10000	10000	10000	3000	500	500
				Total all Classes	6000	1,000	1,000

A number of important points can be made by looking at the set of information above. First, information is not commonly presented to the user in this way. Commonly this information is presented on the balance sheet as shown below:

Equity		
Class A Preferred Stock; $1 par value, authorized 20,000 shares; 20,000 shares issued; 6,000 shares outstanding; liquidation preference	2,000	1,000
Class A Common Stock; $1 par value, authorized 10,000 shares; 10,000 shares issued; 3,000 shares outstanding	500	500
Class B Common Stock; $1 par value, authorized 10,000 shares; 10,000 shares issued; 3,000 shares outstanding	500	500
Additional Paid in Capital	2,000	1,000
Retained Earnings (Accumulated Losses)	1,000	1,000

The information for each class is presented as part of the balance sheet line item as compared to the tabular format. Second, the total is not presented on the balance sheet. Further, if the shares outstanding were different between the current and prior period, that fact would need to be presented in the line item description. Finally, as pointed out in the prior examples, which say Cash and Cash Equivalents has no additional "properties" associated with them, Property, Plant and Equipment can as can the disclosures for a class of stock.

15.5.5.6. Detail/summary with only one detailed item

This example focuses on one specific point. As you can see in the screenshot below of information about classes of preferred stock and common stock; the common stock has two classes whereas the preferred stock has only one:

Classes of Preferred Stock

Class	Par Value	Share Subscriptions	Shares Authorized	Shares Issued	Shares Outstanding	Amount 2010	Amount 2009
company:ClassAPreferredStockMember	1	20000	20000	20000	6000	2,000	1,000
				Total all Classes	6000	2,000	1,000

Classes of Common Stock

Class	Par Value	Share Subscriptions	Shares Authorized	Shares Issued	Shares Outstanding	Amount 2010	Amount 2009
company:ClassACommonStockMember	1	10000	10000	10000	3000	500	500
company:ClassBCommonStockMember	1	10000	10000	10000	3000	500	500
				Total all Classes	6000	1,000	1,000

How would or should having only one [Member] in a breakdown impact the modelling of information? The question should not really be about whether one specific company has one class of two or more classes of something; but rather modelling should be driven by the possibility of ever having either only one or one-to-many [Member]s of some class of information.

The point here is that an entity could have more than one class of preferred stock and a class of preferred stock can have a number of properties. Both the details of the class and the total of all classes, in the case shown above the total and the class are the same because there is only one member within the class; however, the total and the amount for each class are two different pieces of information.

15.5.5.7. Master/detail by [Axis] and [Member]s

The notion of "master/detail" is commonly communicated using the example of an invoice which has information applicable to the entire invoice such as the invoice number and date; and detail information which is associated with the line items of the invoice such as the product number, the quantity and the amount. An invoice always has one number and date, but it can have one or many line items.

A similar pattern occurs within a financial report as shown by the related party and related party transactions disclosure below:

NOTE 16. RELATED PARTY TRANSACTIONS

The following is a summary of related party of the company and transactions with those related parties:

Related Parties

Name of Related Party	Type of Relationship	Nature of Relationship
company:RelatedParty1Member	Parent	This is other descriptive information about the relationship.
company:RelatedParty2Member	JointVenture	This is other descriptive information about the relationship.

Transactions with Related Parties

Party	Transaction Description	Pricing Policy	Amount
company:RelatedParty1Member	Transaction 1 description	Cost	1000
company:RelatedParty1Member	Transaction 2 description	Cost	1000
company:RelatedParty2Member	Transaction 1 description	Cost	1000
company:RelatedParty2Member	Transaction 2 description	Cost	1000

This disclosure shows two related parties and a total of four related party transactions, two each for the two related parties.

This information can be modelled as shown below in first the modelling of the related parties and the then the modelling of the related party transactions.

1	**Related Parties**	[Network]		
2	**Related Parties [Table]**	[Table]		
3	**Legal Entity [Axis]**	[Axis]		
4	Consolidated Entity [Member]	[Member]		
5	**Related Party Name [Axis]**	[Axis]		
6	Related Party 1 [Member]	[Member]	For Period	
7	Related Party 2 [Member]	[Member]	For Period	
8	**Related Parties [Line Items]**	[Line Items]		
9	Related Party [Hierarchy]	[Abstract]		
10	Related Party, Type of Relationship	[Concept]	For Period	
11	Related Party, Nature of Relationship	[Concept] Text/String	For Period	

1	**Related Party Transactions**	[Network]		
2	**Related Party Transactions [Table]**	[Table]		
3	**Legal Entity [Axis]**	[Axis]		
4	Consolidated Entity [Member]	[Member]		
5	**Related Party Name [Axis]**	[Axis]		
6	Related Party 1 [Member]	[Member]	For Period	
7	Related Party 2 [Member]	[Member]	For Period	
8	**Related Party Transaction Type [Axis]**	[Axis]		
9	Related Party Transaction Type, All [Member]	[Member]	For Period	
10	Agency Arrangements with Related Party [Member]	[Member]	For Period	
11	Leasing Arrangements with Related Party [Member]	[Member]	For Period	
12	Purchase or Sale of Goods with Related Party [Member]	[Member]	For Period	
13	Purchase or Sale of Property or Other Assets with Related Party [Member]	[Member]	For Period	
14	**Related Party Transaction [Line Items]**	[Line Items]		
15	Related Party Transaction [Hierarchy]	[Abstract]		
16	Related Party Transaction, Description	[Concept] Text/String	For Period	
17	Related Party Transaction, Pricing Policy	[Concept] Text/String	For Period	
18	Related Party Transaction, Amount	[Concept] Monetary	For Period	Debit

Common between the two tables is the Related Party Name [Axis]. It is that [Axis] which connects the related party disclosure with the transactions for each related party.

While in this case there is no aggregation which connects the two [Table]s, the two [Table]s are connected. The related party transactions [Table] has another [Axis] used to differentiate the different transactions associated with a related party.

For more detailed information, see the *Nested Compound Fact* business use case.

15.5.6. Don't mix representation approaches

If one is not conscious of what they are modelling, there is a good probability that you switch between alternative modelling approaches within the same [Table] and don't even realize it. Arbitrarily shifting from one modelling approach to another modelling approach in the same [Table] simply will not work.

For example, if a balance sheet is modelled using concepts throughout the entire balance sheet, and then you choose to add detail which is supposed to show up on the balance sheet but express that detail using [Member]s of an [Axis] the balance sheet will likely not work correctly in some area; either the calculation relations expressed will not foot, the business rules will not work or will seem inconsistent with other similar types of rules, it will not render correctly or some other problem may occur.

As such, be conscious, create all components, and if all the components work correctly all things considered, your modelling is fine.

15.5.7. Choosing between alternative representation approaches

Many times a modeller has no choice as to which approach to use to break down details. For example, if the Property, Plant and Equipment details were shown on the face of the balance sheet, then the [Line Items] approach must be used because otherwise the details would not render on the balance sheet and the balance sheet would not foot. As such, the details must be modelled as additional [Line Items].

Whereas, if a modeller needs to connect additional properties to a concept to communicate relationships between concepts, creating an [Axis] and articulating the a breakdown using [Member]s of that [Axis] has advantages.

Modelling information can involve trade-offs. Establishing and following a set of principles and communicating those principles followed to users of a taxonomy can be helpful to users of that taxonomy.

15.5.8. US GAAP taxonomy examples

To better understand the different types of relations the US GAAP Taxonomy can be of help. The following are a few examples which help you understand the differences between the different categories of [Table] relations:

- Nonmonetary Transactions [Table] is not related to any other [Table] in the entire US GAAP taxonomy nor in any SEC XBRL financial filing; it ties to nothing. It is stand alone.
- Subsequent Events [Table]. Likewise unrelated.
- Balance Sheet [Table] and the Property, Plant and Equipment Components [Table] are related in that the total of PPE is on the balance sheet and that total PPE also serves as the intersection to the detailed breakdown, whether these concepts are expressed using [Member]s of an [Axis] or if they are expressed as concepts (XBRL items) within [Line Items].

- Property, Plant and Equipment Components [Table] and the Property, Plant and Equipment Estimated Useful Lives [Table] are related by the Class of Property, Plant and Equipment [Axis].
- Income statement [Table] is related to the Business Segment Breakdown [Table] and the Geographic Areas Breakdown [Table].

15.6. Intersections

Intersections are general relations between report elements which may exist in more than one component and therefore can be leveraged for navigating between components of the digital financial report. For example,

- A characteristic such as "Legal Entity [Axis]" might be shared by every component within a digital financial report
- A characteristic such as "Property, Plant and Equipment Type [Axis]" might exist on a component which describes the accounting policies of property, plant and equipment and another which describes the amounts of property, plant and equipment and so someone using that digital financial report can reconfigure the report in order to work with this information together. Basically, users of information are not constrained by how the creator modeled the information, only by the available intersections available within the digital financial report
- An analyst can easily search on any concept and quickly locate that fact within the digital financial report without having to manually scour through the entire document; basically software does the work for you

16. Verification of Digital Financial Reports

How do you know that your digital financial report is created properly? What evidence do you have which proves to yourself and others that your digital financial report is verifiably correct?

16.1. Summary of automated and manual verification tasks

The following is a summary of automated and manual verification tasks organized into somewhat of a digital disclosure checklist:

#	Goal or Desired State of Digital Financial Report	More information	Comments, examples, etc.	Automatable	Manual	FY 2013 (automatable tests only)	FY 2012 (automatable tests only)
1	XBRL technical syntax consistent with XBRL technical specification requirements	See		X		99.9%	99.9%
2	Consistent with requirements of EDGAR Filer automated and manual (EFM) syntax/semantics rules	See		X	X	97.9%	80.5%
3	Consistent and unambiguous report level representation or model structure	See	Tests arrangement of Network, Table, Axis, Member, Line Items, Abstracts, Concepts	X		99.9%	97.9%
4	Root entity of focus (economic entity, accounting entity) successfully and unambiguously detectable	See	If the entity of focus is not detected, unable to perform other tests	X		99.2%	98.8%
5	Current balance sheet date (document period end date) and income statement period (period context of document period end date) successfully and unambiguously detected	See		X		99.3%	99.8%
6	Fundamental accounting concept skeleton successfully and unambiguously detected and relations between concepts intact/sound	See		X		97.8%	97.9%
7	Primary financial statement roll up computations (balance sheet, income statement, statement of comprehensive income, cash flow statement) detected, intact, and foot	See	This has a dependency on discovery of fundamental accounting concepts. For example, if the concept "net cash flow" is not found, won't be able to find a roll up for net cash flow either.	X		90.1%	84.9%
8	Primary financial statements successfully discovered		This should be automatable, but if certain conditions exist it cannot be automated.	X	X	Generally successful	Generally successful
9	Primary financial statements foot and roll forward (cash flow statement, statement of changes in equity) appropriately		This is a duplicate of #7 which does not include the roll forwards; this is beyond the primary financials footing	X		Unknown	Unknown
10	Level 1 footnote disclosures appropriate		There is no way to automate this 100% unless the filer uses concepts from the US GAAP XBRL taxonomy.	X	X	Unknown	Unknown
11	Industry specific accounting concepts and relations valid		Similar to the fundamental accounting concepts, but for specific industries or activities	X	X	Unknown	Unknown
12	Level 2 policy text block disclosures appropriate				X	Fair	Unknown
13	Each Level 3 [Text Block] and related Level 4 detail disclosure match appropriately	See		X	X	Poor	Poor
14	Each Level 4 detail disclosure valid including representation structure, mathematical computations, intersections with other components, etc.	See	See the separate disclosure testing algorithm	X	X	Unknown	Unknown
15	Required disclosures discovered		Nature of business, basis of reporting, accounting policies and all other required disclosures are discovered	X		Unknown	Unknown
16	Reported prior period information consistent with prior report current period information where appropriate			X	X	Unknown	Unknown
17	Disclosure rules have been met and make sense		For example, if PPE exists on the balance sheet then PPE details should be discovered to be disclosed and PPE estimated useful lives should be discovered to be disclosed	X	X	Unknown	Unknown
18	Report element selection is justifiable, defensible, and otherwise appropriate				X	Unknown	Unknown
19	Reported facts appropriate				X	Unknown	Unknown
20	Variance analysis of reported facts as compared to peer or peer group appropriately explainable		Generally automatable using management by exception approach	X	X	Unknown	Unknown
21	Report element selection is consistent with peers or peer groups as appropriate				X	Unknown	Unknown
22	Disclosure checklist review for full inclusion		There is no way to automate the process of detecting things which should have been disclosed based on transactions, events, or other circumstances that are not included within report		X	Unknown	Unknown
23	True and fair representation of financial information of economic entity				X	Unknown	Unknown

http://www.xbrlsite.com/2014/Library/DisclosureChecklist.pdf

16.2. Defining verification

Verification is the process of research, examination, and other tasks and steps required to prove or establish validity; evidence that establishes or confirms the accuracy or truth of something. Verification is a formal assertion of validity.

Validity can be defined as being well grounded; producing the desired result; free from logical flaw; based on sound reasoning; cogent. (i.e. complete, correct, consistent, accurate, has fidelity, has integrity)

Validity when it comes to an SEC XBRL financial report is, arguably, that such a financial report is a true and fair representation of a reporting entities financial and nonfinancial information articulated by such a financial report.

A financial report can be said to be valid if it possesses certain traits which can be defined in general terms and for clarity are listed below to bring them into the reader's mind:

- **Completeness**: Having all necessary or normal parts, components, elements, or steps; entire.
- **Correctness**: Free from error; in accordance with fact or truth; right, proper, accurate, just, true, exact, precise.
- **Consistency**: Compatible or in agreement with itself or with some group; coherent, uniform, steady. Holding true in a group, compatible, not contradictory.
- **Accuracy**: Correctness in all details; conformity or correspondence to fact or given quality, condition; precise, exact; deviating only slightly or within acceptable limits from a standard.

While these four notions which relate to the "trueness" and "fairness" must exist for every fact reported by a financial report, they also need to exist when considering the financial report in its entirety.

Two other notions help bring the notion of trueness and fairness of information at the fact and at the report level into focus:

- **Fidelity**: Fidelity relates to the loyal adherence to fact or detail; exactness. The faithful representation of the facts and circumstances represented within a financial report properly reflect, without distortion, reality. High fidelity is when the reproduction (a financial report) with little distortion, provides a result very similar to the original (reality of company and environment in which company operates).
- **Integrity**: Integrity is holistic fidelity. Integrity relates to the fidelity of the report in its entirety, of all parts of a financial report, from all points of view. Integrity is holistic accuracy, accurate as a whole. Integrity is the quality or condition of being whole or undivided; completeness, entireness, unbroken state, uncorrupt. Integrity means that not only is each component of a financial report is correct but all the pieces of the financial report fit together correctly, all things considered.

To an accountant the notions of verification and validity and that a financial report must be complete, correct, consistent, and accurate as defined above are a statement of the obvious. We know this. Accountants have performed these tasks for hundreds of years and have a reputation for performing this task well. This is not new to accountants. Further, these traits which a financial report must possess are the obligations of those creating these reports; they are not options. Accountants don't pick and choose whether a financial report is to be true and fair; those traits must be true by definition.

HINT: To understand integrity correctly, it is important to understand the notion of an "**intersection**". An intersection is a physical connection between two pieces of a financial report, some report element. For example, "Inventories" as a line item on the balance sheet and "Total inventories" as shown within the detailed breakdown of inventory is the same thing, the same physical fact. But, if this is not expressed correctly, such as if they were modeled as two different concepts, errors could be introduced into the digital financial report and the error can be masked by the improper modeling. Part of integrity is that there are no such modeling mistakes and therefore no mathematical errors which could possibly be masked by a modelling mistake.

16.3. True and fair representation is the goal

So what is a true and fair representation of financial information? We stated above in general terms that a true and fair representation is: complete, correct, consistent, accurate, is identified as having fidelity, and is identified as having integrity. If all these exist we can distinguish the financial report as being "valid".

But these terms are rather general. Looking at verification at a slightly more detailed level we might see the following traits as being important to distinguishing a financial report as a true and fair representation of a reporting entity's financial information:

- **All financial report formats convey the same message**: A financial statement can be articulated using paper and pencil, Microsoft Word, PDF, HTML, XBRL, or other format. But while the format may change, the message communicated, the story you tell, should not change. Each format should communicate the same message, regardless of the medium used to convey that message.
- **Information fidelity and integrity**: A financial report is internally consistent. A financial statement foots, cross casts, and otherwise "ticks and ties". The accountant community understands this and many times this fact disappears into unconsciousness because it is so ingrained. Of course things foot and cross cast; of course the pieces tie together. Said another way, a financial statement must be correct, complete, consistent, and accurate. Only trained accounting professionals who understand how the XBRL medium works can tell if all financial statement computations are properly articulated and verified to be correct.
- **Justifiable/defensible report characteristics**: Facts reported and the characteristics which describe those reported facts should be both justifiable and defensible by an accounting entity reporting such facts.
- **Consistency between periods**: Generally financial information expressed within one period should be consistent with the financial information expressed within subsequent periods, where appropriate. Clearly new information will be added and information which becomes irrelevant will be removed from a financial report. Changes between report elements which existed in both periods should be justifiable/defensible as opposed to arbitrary and random.
- **Consistency with peer group**: If your company chooses one approach and a peer chooses another report element selection choice; clearly some good reason should probably exist. This is not to say differences would not or should not occur. Rather, why the differences exist should make sense. Generally financial information between two peers should be more consistent as compared to inconsistent.
- **Logical representations indicated by understandable renderings**: Human readable renderings of facts; characteristics that describe facts; parenthetical explanations which further describe such facts; and other such representation structures should make sense and be both consistent with other similar representation structures. While there may be differences of opinion as to how to format or present such information; there should be

significantly less or no dispute about the logic of a machine readable representation.

- **Unambiguous business meaning**: A financial report should be unambiguous to an informed reader. The business meaning of a financial report should be clear to the creator of the financial report and likewise clear to the users of that financial report. Both the creator and users should walk away with the same message or story. A financial report should be usable by regulators, financial institutions, analysts, investors, economists, researchers, and others to desire to make use of the information the report contains as they see fit.

Again, we don't think we are enlightening any accountants with this information. What we are doing is bringing this information into the fore front of your consciousness for a particular reason. There is something which is new.

What is new, and what must occur for these new digital mediums such as XBRL and financial reports expressed using XBRL to be successful, is for accountants to be able to perform these same tasks using these new digital mediums. And because computers can read these new mediums and understand what it is reading, computers can both help accountants with these verification tasks and point out situations where financial reports do not possess these distinguishing features. It is not hard to imagine that a computer can help understand if a financial report "ticks and ties", "cross casts and foots" according to the rules of the medium used to express that information.

But, to achieve this how to use such a digital medium must be well understood, the semantics or meaning of the medium must be well defined, and the mechanics of such a medium must be understood and the same for all parties involved in the creation or use of a financial report expressed using such medium.

16.4. Properly differentiating semantics and syntax

Critical to obtaining a proper understanding of verification is properly differentiating the terms semantics and syntax.

An SEC XBRL financial report is a definitive, discrete, finite set of objects. Obviously this has to be true, it is a physical thing. The truth is that a paper-based financial report is likewise a definitive, discrete, finite set of objects. The only difference between the two is the medium used to express the information.

No accountant really looks at a paper report in this manner, as a set of objects. But to create a digital expression of a financial report this is exactly what must occur: these specific objects must be identified and described. This is how the unstructured paper-based financial report becomes "digitized" and articulated as a digital financial report.

And these objects can be described and they have been described. We will get to this in a moment. There are two ways these objects which make up a financial report can be described: syntactically and semantically.

Syntax relates to how you say something, *semantics* relates to the meaning of what you say.

HINT: Explaining the difference between **syntax** and **semantics** is (a) critically important to what this document is trying to communicate and (b)

beyond the scope of this document to explain in detail. We will assume that the reader understands this distinction. If you do not understand the difference between syntax and semantics, please stop reading now and be sure to understand this distinction clearly before you continue with this document because if you do not understand this distinction, this document will make little sense to you. Two good resources for understanding this distinction are the following:

The video How XBRL Works: http://www.youtube.com/watch?v=nATJBPOiTxM

This video about semantics: http://www.youtube.com/watch?v=OGg8A2zfWKg

When it comes to creating an SEC XBRL financial filing it is of critical importance to understand the following key points:

- Like was said, an SEC XBRL financial report, just like any other financial report expressed using any other medium, is a definitive, discrete, finite set of objects.
- Those objects can be looked at through the lenses of a technical syntax, such as the XBRL technical syntax, which describes how something is said.
- Those same objects can be looked at through the lens of semantics, which describes what you mean.
- Forcing business professionals to relate to those objects using the XBRL technical syntax is one way to working with an SEC XBRL financial report. But doing so has the ramification of requiring the business user to understand the XBRL technical syntax.
- Creating software which hides the XBRL technical syntax behind a layer of semantics is another way of working with an SEC XBRL financial report. Doing this has ramifications also. Doing this allows business professionals to relate to the SEC XBRL financial report in terms which they tend to already understand.
- Business professionals are far more comfortable working with business semantics than with XBRL technical syntax. Nor should business professionals be forced to work with XBRL technical syntax.
- Technical people do not understand how to create financial reports. Nor should they.

If you think about it, how could someone create a an SEC XBRL financial report and do so correctly without being able to formally verify that the SEC XBRL financial report is a true and fair representation of the reporting entity if the process they are using is a black box or a process which they don't understand?

16.5. Realizing what accountants and other business professionals need to be successful

Who needs to verify an SEC XBRL financial report to be sure that the financial report is a true and fair representation of the reporting entity and that it communicates what management chooses to communicate, given the requirements imposed by the SEC and US GAAP and using the choices desired by the reporting entity?

- An **accountant** or team of accountants can perform a specific set of steps which will allow them to be sure that the financial report which they created is

a true and fair representation of the financial information of the reporting entity for which the financial report has been created.

- **Management** of the reporting entity (CEO, CFO, members of the audit committee, investor relations, legal counsel) for which the financial report has been created can ask the team of accountants "are you sure these are correct" and the accountant or team of accountants can reasonably reply, "yes, we are sure". Or, management can verify for themselves by performing specific tasks/steps.
- **A third party accountant** can state that a financial report "presents fairly" the financial information of the reporting entity because they have performed a specific set of tasks/steps which allow them to be sure that the financial report "presents fairly" such information.
- **Investors, regulators and analysts** who consume information need to be sure what they are consuming is correct.

Two key points about the list above are important to understand. First, note that the information technology department is not included in the list. The IT department does not generally sign off on a financial report. Second, how could anyone sign off or use an SEC XBRL financial report without being sure that the information is correctly expressed without understanding the XBRL technical syntax if an alternative approach to understanding the technical syntax does not exist?

Well, you don't need to understand the XBRL technical syntax if software makes sure that what you have said is always compliant to the XBRL technical syntax and provides you with transparency into what you have said and help you understand if it is what you meant to have said.

The key to verification of an SEC XBRL financial report which empowers business professionals to be sure they are saying what they mean to say and which follow the XBRL technical syntax without the business user needing to understand that technical syntax.

Focusing on semantics enables the business user to achieve exactly that.

16.6. Definition of semantic objects, relations, and properties

It was stated earlier in this document that a financial report is comprised of a definitive, discrete, finite set of objects, relations between those objects. Each of these objects and relations has a definitive, discrete, finite, set of properties.

This section defines these objects, relations, and properties.

Clear, concise definitions are important for two reasons. First, if terminology is not precise then communication cannot occur because parties to the communication cannot be sure they are talking about the same thing. Secondly, these objects need to be implemented within software applications and clear/unambiguous communication of these objects is necessary to enable such software to be implemented.

This document uses terminology defined by the Financial Report Semantics and Dynamics Theory and the US GAAP taxonomy Architecture. The Financial Report Semantics and Dynamics Theory provides a medium independent definition of a set of semantics and dynamics which have been proven to work with SEC XBRL financial filings. The US GAAP Taxonomy Architecture is a set of technical rules which must be followed by SEC filers who create XBRL financial reports.

HINT: We provide only a summary of information from the two documents mentioned above. For a better understanding of these two documents, please refer to the documents themselves.

16.7. Financial report level semantics

[CSH: This is a duplicate]

In order to "digitize" a financial report you need to break that financial report into pieces that a computer software application can interact with. Each of these pieces has to be referred to so some term needs to be created and used to discuss each of these financial report pieces. The following is a summary of these fundamental and important definitions of financial report semantics from the Financial Report Semantics and Dynamics Theory:

- **Financial report**: Report which communicates financial and nonfinancial information to users of that report. Financial reports contain facts, characteristics which describe those facts, parenthetical explanations of facts, relations between facts/characteristics. Each of these report elements has properties.
- **Component**: A component is a set of facts which go together for some specific purpose within a financial report. A component can also be broken down into subcomponents.
- **Fact**: A fact defines a single, observable, reportable piece of information contained within a financial report, or fact value, contextualized for unambiguous interpretation or analysis by one or more characteristics. Numeric fact values must also provide the additional traits "units" and "rounding" to enable appropriate interpretation of the numeric fact value. Facts may have zero or many parenthetical explanations which provide additional descriptive information related to the fact.
- **Characteristic**: A characteristic provides information necessary to describe a fact. A fact may have any number of characteristics.
- **Parenthetical explanation**: Facts may have parenthetical explanations which provide additional descriptive information about the fact.
- **Relation**: Components can be related to other components. Facts can be related to other facts. Characteristics can be related to other characteristics. Model structure is a type of relation which describes how report elements relate to one another. Business rules are a type of relation which describes computation type relations.
- **Property**: Financial reports have a known set of properties. Components have a known set of properties. Facts have a known set of properties. Characteristics have a known set of properties. The concept characteristic has additional properties: period type, data type, balance type. Relations have a known set of properties.

For more details we encourage you to read the *Financial Report Semantics and Dynamics Theory*.

HINT: This video walks you through these terms: http://www.youtube.com/watch?v=uC-hrpxJ_fA .

16.8. US GAAP taxonomy implementation model of financial report semantics

[CSH: This is a duplicate]

A digital financial report must at some point be implemented. That implementation takes the form of some sort of model. A report element or model element is a piece of a digital financial report, a part of the implementation model. The types of report element or model elements can be grouped or categorized.

An SEC XBRL financial report is an implementation of a financial report as defined by the Financial Report Semantics and Dynamics Theory. The US GAAP Taxonomy Architecture defines important pieces of how an SEC XBRL financial report must be created, its model. The following is a summary of the US GAAP taxonomy implementation model of these financial report semantics as used in SEC XBRL financial filings:

- **Network**: A network is a one approach to break a digital financial report into smaller pieces. There are two reasons why you might need to break a financial filing into pieces: because you want to or because you have to. Specific semantics of networks are not defined by the SEC or by the US GAAP Taxonomy.
- **Table**: A table is used to combine facts which go together for some specific reason. Tables are comprised of axis and line items. The line items of a table share the axis defined within a table. There are two types of tables: explicit tables and implicit tables. Implicit tables only have the axis reporting entity and period. An explicit table always has at least one defined [Axis], it could have more than one. An explicit [Table] always has one set of [Line Items]. Specific semantics of tables are undefined.
- **Axis**: An axis is a means of providing information about the characteristics of a fact reported within a financial report.
- **Member**: A member is a possible value of an [Axis]. A [Member] is always part of a domain of an [Axis], thus the term "member" (i.e. of the domain or set; a domain is simply a set of [Member]s which relates to a specific [Axis]).
- **Line Items**: [Line items] are a set of concepts which can be reported by an entity, they can contain values. [Line Items] may also contain [Abstract] concepts which can never report values but rather are used to help organize the [Line Items].
- **Concept**: A concept refers to a financial reporting concept or a non-financial concept which can be reported as a fact within an SEC XBRL financial filing. A concept is sometimes referred to as a concrete concept, as compared to an abstract concept. [Line Items] contain concepts organized within a component which have the same information model. Concepts can be concrete (meaning they can be reported) or abstract (meaning that they are never reported; they are only used to organize the concepts contained within a set of line items).
- **Fact**: A fact is a single, observable, reportable piece of information contained within a financial report. Facts have values which could be textual, numeric, or prose. Numeric facts have two additional traits: units and rounding. Facts may have one or more additional parenthetical explanations. Facts are characterized by a set of [Axis] which provide additional important information necessary to understand the fact.

HINT: For more information about these report level semantic objects please see: http://secxbrlglossary.wikispaces.com/Report+Element and the US GAAP Taxonomy Architecture section 4.5 Implementation of Tables.

16.9. Connecting the report level model to its implementation model

The following table pulls the semantics of the *Financial Report Semantics and Dynamics Theory* together into its implementation model as an SEC XBRL financial filing which follows the US GAAP Taxonomy Architecture, effectively reconciling the two:

Financial Report Semantics and Dynamics Theory Term	US GAAP Taxonomy Architecture /SEC Model Term
Financial Report	**SEC XBRL financial report** (XBRL instance + XBRL taxonomy)
Component	**Network + Table** (explicit or implied)
Characteristic	Many different technical approaches including: **[Axis]**, **[Member]**, **[Line Items]**, **Concept**, Entity identifier (semantically is an [Axis], Period (semantically is an [Axis])
Fact	**Fact**
Parenthetical Explanation	XBRL Footnote (which is not the same as a financial statement footnote)
Relation (structural, business rules, flow)	**Information Model** (Roll up, roll forward, adjustment, variance, hierarchy, etc.); **Member aggregation model** (partial set, complete flat set, complete hierarchical set, etc.); **Business rules** (Roll up implemented as XBRL calculations syntax, roll forward, member aggregation, adjustment, variance, complex computation); Number, Category, Title which expresses sort order of networks
Property	XML element or XML attribute which could be implemented as XML, XBRL, XML Schema, or XLink technical syntax

HINT: It is not critical for business professionals to understand the details of how these two models are combined to enable the creation of an SEC XBRL financial report. What is important is that the scheme works and that they understand how to use software which implements this scheme. This informational summary is provided to more help technical people understand this connection and to provide both an overview of this connection and point to the additional details necessary to truly understand this connection.

More detailed information which connects and reconciles this terminology including an additional reconciliation to the XBRL technical syntax can be found in APPENDIX C which also reconciles the semantic objects to the XBRL technical syntax. Further, this diagram provides additional helpful information:

http://www.xbrlsite.com/2012/FinancialReportSemanticsAndDynamicsTheory/TheoryPlusImplementation_v2.pdf

Additional details on the *Financial Report Semantics and Dynamics Theory* can be found here:

http://xbrl.squarespace.com/fin-report-sem-dyn-theory/

Additional details on the implementation model of an SEC XBRL financial report can be found here:

http://xbrl.squarespace.com/digital-financial-reporting/

HINT: XBRL International has created a global standard report-level model, the XBRL Abstract Model 2.0. For more information please see:

http://xbrl.squarespace.com/journal/2012/6/27/mapping-from-sec-xbrl-model-semantics-to-xbrl-abstract-model.html

It is easy to validate a financial report which is created on paper. All you need to do is give the report to a competent accountant, hand them a 10-key and green eye shades, give them a paper disclosure checklist and your worries are over; the accountant will make sure it is correct. The problem is that this process is labor intensive, the knowledge of accountants can vary widely, it is time consuming because it is labor intensive and it is costly because it is labor intensive. Further, because accountants are human they can make mistakes.

SEC XBRL financial filings changes this equation. The XBRL format can be read by software applications and many of the verification processes can be automated as a result. You will never be able to do away will all human involvement. In fact, because the mindless work of making sure everything foots and cross casts and otherwise ticks and ties; the knowledge of an accountant can be applied to other important areas of verification which were never performed because the analysis budget was used up on the mindless tasks and these more important tasks can never be automated, they take human judgment.

Further, even this "automated verification" will be rendered obsolete when software applications perform these tests as you create your financial report within a software application which understands the semantics of a financial statement.

16.10. Visualizations of semantic objects, relations, and properties

The following are visualizations which provide examples for the objects into which a financial report can be broken down. The visualizations are organized in a top-down

approach beginning with a dashboard which organizes verification information into logical groupings.

This set of semantic objects, relations, and properties is shown using the XBRL Cloud *Evidence Package* which is a product which can be used by accountants in the verification process. Other products have similar reports. XBRL Cloud's reports are provided with permission from XBRL Cloud.

> *HINT*: These visualizations are taken from HTML pages generated from a working prototype of a verification application. You can see the entire prototype at this URL:
>
> http://www.xbrlsite.com/US-GAAP-2012/ReferenceImplementation/2012-08-01/business-report-package

The reference/model implementation of an SEC XBRL financial report was used to create this particular Evidence Package and the related screen shots. For more information, please see Appendix D: Reference/Model Implementation.

16.10.1. Verification dashboard

The verification dashboard is an aggregation and organization of all verification information into on easy to understand "dashboard" for a particular digital financial report.

The verification dashboard has three sections. The first section provides a summary of all automated verification testing results. The second section provides a summary of manual verification tasks. The third section provides details of verification results by component of the digital financial report. This screen shot is an example of a verification dashboard:

Verification Dashboard

Automated Verification Summary

The goal is to create a verifiably correct true and fair representation of a reporting entity's financial information. The report should be complete, correct, consistent, accurate. The report should have fidelity and integrity.

			List	List	List	List	List	List	List	List	List
	Status	Count of Relations	XBRL Technical Syntax	Automatable EFM Rules	XBRL-US Consistency Suite Rules	Structure Rules(US GAAP Taxonomy Architecture)	US GAAP Domain Level Rules	Industry / Activity Specific Rules	Reporting Entity Specific Rules	Reportability Rules	Other Rules and Best Practices
Summary of all components (networks/tables)	Incomplete	451	OK	726	1	OK	OK	OK	OK	OK	119
Automated rules defined			0	0	0	0	0	0	119	0	0
Automated rules PASSED			0	0	0	0	0	0	200	0	0
Automated rules FAILED			0	726	1	0	0	0	0	0	119

Manual Verification Summary

			List	List
	Status	Count of Relations	EFM Review Tasks	Other Manual Review Tasks
Summary of all components (networks/tables)	Completed	451	OK	OK
Manual rules defined			0	0
Manual rules PASSED			0	0
Manual rules FAILED			0	0

Component Perspective

This matrix provides detail about the verification status of the individual components which make up the financial report.

Component (Network/Table)	Status	Count of Relations	Manual Review Tasks	XBRL Technical Syntax	EFM Rules	Model Logical Structure (US GAAP Taxonomy Architecture Rules)	US GAAP Core Financial Report Semantics	US GAAP Consistency Rules	Industry / Activity Specific Rules	Reporting Entity Specific Rules	US GAAP/SEC Disclosure Rules	Other Rules and Best Practices
1100 - Document - Document Information | Document Information [Table]	Incomplete	10	OK	OK	726	OK	OK	1	OK	OK	OK	119
1200 - Document - Entity Information | Entity Information [Table]	Completed	13	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
1300 - Document - Entity Listings Information | Entity Listings [Table]	Completed	11	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
2001 - Statement - Balance Sheet | Balance Sheet [Table]	Completed	44	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK
2002 - Statement - Balance Sheet Parenthetical General | Balance Sheet	Completed	6	OK	OK	OK	OK	OK	OK	OK	OK	OK	OK

16.10.2. Report properties

The report properties visualization shows the properties of the financial report itself.

Report Properties

Summary/General Information

The following is a summary of general information about the report.

Entity registrant name	ABC Company, Inc.
Report identifier (target namespace)	http://www.abc.com/20121231
Prefix	abc
US GAAP taxonomy version	2012 US GAAP Taxonomy (http://fasb.org/us-gaap/2012-01-31)
Document type	10-K
Document period end date	2012-12-31
Document fiscal period focus	FY
Document fiscal year focus	2012
Report file name	https://demo.xbrlcloud.com/user/charles.hoffman@xbrlcloud.com/share/public/xbrlsite/Templates/000000-002-ModelReferenceImplementation-2012-08-01/abc-20121231.xml

16.10.3. Report objects summary

The report objects summary provides a summary of the objects contained within the financial report.

Report Objects Summary

Components	31
Networks	31
Tables	28
Axes	15
Members	45
Line Items	28
Abstracts	61
Concepts	152
Facts	524
Parenthetical explanations	2
Structural relations	451
Business rules	131

16.10.4. Report component summary

The component summary shows a list of the components contained within the financial report. Recall that a component is the combination of a network and a table.

Component Summary

A component is a combination of a network and a table. All facts exist within one or more networks. All facts also exist within one or more tables, be that table an explicitly defined [Table] or an implied table.

#	Sort Code	Type	Title	URI	Table (Explicit or Implied)
1	1100	Document	Document Information	http://www.abc.com/role/DocumentInformation	Document Information [Table]
2	1200	Document	Entity Information	http://www.abc.com/role/EntityInformation	Entity Information [Table]
3	1300	Document	Entity Listings Information	http://www.abc.com/role/EntityListingsInformation	Entity Listings [Table]
4	2001	Statement	Balance Sheet	http://www.abc.com/role/BalanceSheet	Balance Sheet [Table]
5	2002	Statement	Balance Sheet Parenthetical, General	http://www.abc.com/role/BalanceSheetParentheticalGeneral	Balance Sheet Parenthetical, General [Table]
6	2003	Statement	Balance Sheet Parenthetical, Preferred Stock	http://www.abc.com/role/BalanceSheetParentheticalPreferredStock	Stock by Class [Table]
7	2004	Statement	Balance Sheet Parenthetical, Common Stock	http://www.abc.com/role/BalanceSheetParentheticalCommonStock	Stock by Class [Table]
8	2005	Statement	Balance Sheet Parenthetical, Treasury Stock	http://www.abc.com/role/BalanceSheetParentheticalTreasuryStock	Class of Treasury Stock [Table]
9	2006	Statement	Income Statement	http://www.abc.com/role/IncomeStatement	Income Statement [Table]
10	2007	Statement	Comprehensive Income	http://www.abc.com/role/ComprehensiveIncome	Comprehensive Income [Table]
11	2008	Statement	Cash Flow Statement	http://www.abc.com/role/CashFlowStatement	Cash Flow Statement [Table]
12	2009	Statement	Prior Period Adjustment	http://www.abc.com/role/PriorPeriodAdjustment	Changes in Stockholders' Equity [Table]
13	2010	Statement	Changes in Total Stockholders' Equity	http://www.abc.com/role/ChangesInTotalStockholdersEquity	Changes in Stockholders' Equity [Table]
14	4010	Disclosure	Nature of Business	http://www.abc.com/role/NatureOfBusiness	Nature of Business [Table]
15	4020	Disclosure	Significant Accounting Policies	http://www.abc.com/role/SignificantAccountingPolicies	Significant Accounting Policies [Table]
16	4030	Disclosure	Property, Plant and Equipment Policies	http://www.abc.com/role/PropertyPlantAndEquipmentPolicies	Property, Plant and Equipment Components [Table]
17	5010	Disclosure	Cash, Cash Equivalents, and Marketable Securities	http://www.abc.com/role/CashCashEquivalentsAndMarketableSecurities	Cash, Cash Equivalents, and Marketable Securities [Table]
18	5020	Disclosure	Cash and Cash Equivalents Components	http://www.abc.com/role/CashAndCashEquivalentsComponents	Cash and Cash Equivalents Components [Table]
19	5030	Disclosure	Marketable Securities Components	http://www.abc.com/role/MarketableSecuritiesComponents	Marketable Securities [Table]
20	5040	Disclosure	Inventory Components	http://www.abc.com/role/InventoryComponents	Inventory Components [Table]
21	5050	Disclosure	Property, Plant and Equipment Components	http://www.abc.com/role/PropertyPlantAndEquipmentComponents	Property, Plant and Equipment Components [Table]
22	5060	Disclosure	Deferred Costs	http://www.abc.com/role/DeferredCosts	Deferred Costs Components [Table]
23	5070	Disclosure	Product Warranty Accrual	http://www.abc.com/role/ProductWarrantyAccrual	Product Liability Contingency [Table]
24	5080	Disclosure	Long-term Debt Instruments	http://www.abc.com/role/LongTermDebtInstruments	Long-term Debt Instruments [Table]
25	5090	Disclosure	Maturities of Long-term Debt	http://www.abc.com/role/MaturitiesOfLongTermDebt	Maturities of Long-Term Debt [Table]
26	5110	Disclosure	Other Noncurrent Liabilities	http://www.abc.com/role/OtherNoncurrentLiabilities	Other Noncurrent Liabilities [Table]
27	5120	Disclosure	Business Segments	http://www.abc.com/role/BusinessSegments	Business Segment Information, by Segment [Table]
28	5130	Disclosure	Geographic Areas	http://www.abc.com/role/GeographicAreas	Revenues from External Customers and Long-lived Assets by Geographic Area [Table]
29	5140	Disclosure	Nonmonetary Transactions	http://www.abc.com/role/NonmonetaryTransactions	Nonmonetary Transaction, by Type [Table]
30	5150	Disclosure	Select Financial Information	http://www.abc.com/role/SelectFinancialInformation	Select Financial Information [Table]
31	5160	Disclosure	Subsequent Events	http://www.abc.com/role/SubsequentEvents	Subsequent Event [Table]

16.10.5. Report business rules

The report business rules provide all business rules relations which relate to no particular component; rather they tend to be cross-component type rules.

Business Rules Summary Information

Assertions

	Found and compiled	Fired	Satisfied	Unsatisfied
Existence assertions	58	58	58	0
Value assertions	61	142	142	0
Consistency assertions	0	0	0	0
Total all assertions	119	200	200	0

Formulas

	Found and compiled	Fired	Facts created
Formulas	0	0	0

Calculations

	Found and compiled	Fired	Satisfied	Unsatisfied
Calculations	12	26	26	0

XBRL Formulas

Existence Assertions

ID	Satisfied
ASSERTION_Exists_DocumentPeriodEndDate (evaluations 1)	Satisfied
CORE_1002_LiabilitiesAndEquity_Exists_ALT (evaluations 1)	Satisfied
IND_CI_1002_CurrentLiabilities_Exists_ALT (evaluations 1)	Satisfied
CORE_1003_Equity_Exists_ALT (evaluations 1)	Satisfied
CORE_1005_NetIncomeLoss_Exists_ALT (evaluations 1)	Satisfied
CORE_1006_NetCashFlow_Exists_ALT (evaluations 1)	Satisfied
ASSERTION_Exists_DocumentType (evaluations 1)	Satisfied
ASSERTION_Exists_DocumentFiscalPeriodFocus (evaluations 1)	Satisfied
CORE_1001_Assets_Exists_ALT (evaluations 1)	Satisfied

16.10.6. Report elements

The report element visualization provides a listing of the report elements contained within the financial report. A report element is a distinct category of report objects. A report element relates to the dictionary of the report, not the information which is being reported by the report. (i.e. report elements do not include facts or parenthetical explanations)

Report Elements			
	All	Added	
Networks	31	31	100%
Tables	28	15	54%
Axes	13	0	0%
Members	45	10	22%
Line items	28	15	54%
Abstracts	61	25	41%
Concepts	152	2	1%

16.10.7. Networks

The networks visualization provides a listing of all networks and all the properties of a network.

Networks

#	Sort Code	Type	Title	URI	Relations Count
1	1100	Document	Document Information	http://www.abc.com/role/DocumentInformation	10
2	1200	Document	Entity Information	http://www.abc.com/role/EntityInformation	13
3	1300	Document	Entity Listings Information	http://www.abc.com/role/EntityListingsInformation	11
4	2001	Statement	Balance Sheet	http://www.abc.com/role/BalanceSheet	44
5	2002	Statement	Balance Sheet Parenthetical, General	http://www.abc.com/role/BalanceSheetParentheticalGeneral	6
6	2003	Statement	Balance Sheet Parenthetical, Preferred Stock	http://www.abc.com/role/BalanceSheetParentheticalPreferredStock	13
7	2004	Statement	Balance Sheet Parenthetical, Common Stock	http://www.abc.com/role/BalanceSheetParentheticalCommonStock	14
8	2005	Statement	Balance Sheet Parenthetical, Treasury Stock	http://www.abc.com/role/BalanceSheetParentheticalTreasuryStock	10
9	2006	Statement	Income Statement	http://www.abc.com/role/IncomeStatement	35
10	2007	Statement	Comprehensive Income	http://www.abc.com/role/ComprehensiveIncome	13
11	2008	Statement	Cash Flow Statement	http://www.abc.com/role/CashFlowStatement	39
12	2009	Statement	Prior Period Adjustment	http://www.abc.com/role/PriorPeriodAdjustment	12
13	2010	Statement	Changes in Total Stockholders' Equity	http://www.abc.com/role/ChangesInTotalStockholdersEquity	10
14	4010	Disclosure	Nature of Business	http://www.abc.com/role/NatureOfBusiness	5
15	4020	Disclosure	Significant Accounting Policies	http://www.abc.com/role/SignificantAccountingPolicies	9
16	4030	Disclosure	Property, Plant and Equipment Policies	http://www.abc.com/role/PropertyPlantAndEquipmentPolicies	14
17	5010	Disclosure	Cash, Cash Equivalents, and Marketable Securities	http://www.abc.com/role/CashCashEquivalentsAndMarketableSecurities	8
18	5020	Disclosure	Cash and Cash Equivalents Components	http://www.abc.com/role/CashAndCashEquivalentsComponents	14
19	5030	Disclosure	Marketable Securities Components	http://www.abc.com/role/MarketableSecuritiesComponents	13
20	5040	Disclosure	Inventory Components	http://www.abc.com/role/InventoryComponents	10
21	5050	Disclosure	Property, Plant and Equipment Components	http://www.abc.com/role/PropertyPlantAndEquipmentComponents	15
22	5060	Disclosure	Deferred Costs	http://www.abc.com/role/DeferredCosts	9
23	5070	Disclosure	Product Warranty Accrual	http://www.abc.com/role/ProductWarrantyAccrual	14
24	5080	Disclosure	Long-term Debt Instruments	http://www.abc.com/role/LongTermDebtInstruments	21
25	5090	Disclosure	Maturities of Long-term Debt	http://www.abc.com/role/MaturitiesOfLongTermDebt	12
26	5110	Disclosure	Other Noncurrent Liabilities	http://www.abc.com/role/OtherNoncurrentLiabilities	8
27	5120	Disclosure	Business Segments	http://www.abc.com/role/BusinessSegments	18
28	5130	Disclosure	Geographic Areas	http://www.abc.com/role/GeographicAreas	12
29	5140	Disclosure	Nonmonetary Transactions	http://www.abc.com/role/NonmonetaryTransactions	14
30	5150	Disclosure	Select Financial Information	http://www.abc.com/role/SelectFinancialInformation	12
31	5160	Disclosure	Subsequent Events	http://www.abc.com/role/SubsequentEvents	13

16.10.8. Tables

The tables visualization provides a listing of all tables and the properties of a table.

Tables

#	Label	Prefix	Standard label, Documentation, References, Concept name	Count
1	Balance Sheet [Table]	abc	*Filer label:*Balance Sheet [Table] *Documentation:*Balance sheet. *References:*NONE *Name:* abc:BalanceSheetTable	1
2	Balance Sheet Parenthetical, General [Table]	abc	*Filer label:*Balance Sheet Parenthetical, General [Table] *Documentation:*Balance Sheet Parenthetical, General [Table] *References:*NONE *Name:* abc:BalanceSheetParentheticalGeneralTable	1
3	Business Segment Information, by Segment [Table]	us-gaap	*Standard label:*Schedule of Segment Reporting Information, by Segment [Table] *Documentation:*A table disclosing the profit or loss and total assets for each reportable segment of the entity. An entity discloses certain information on each reportable segment if the amounts (a) are included in the measure of segment profit or loss reviewed by the chief operating decision maker or (b) are otherwise regularly provided to the chief operating decision maker, even if not included in that measure of segment profit or loss. *References:*NONE *Name:* us-gaap:ScheduleOfSegmentReportingInformationBySegmentTable	1
4	Cash and Cash Equivalents Components [Table]	us-gaap	*Standard label:*Schedule of Cash and Cash Equivalents [Table] *Documentation:*Schedule of cash and cash equivalent balances. This table excludes restricted cash balances. *References:*NONE *Name:* us-gaap:ScheduleOfCashAndCashEquivalentsTable	1
5	Cash Flow Statement [Table]	abc	*Filer label:*Cash Flow Statement [Table] *Documentation:*Cash Flow Statement [Table] *References:*NONE *Name:* abc:CashFlowStatementTable	1
6	Cash, Cash Equivalents, and Marketable Securities [Table]	abc	*Filer label:*Cash, Cash Equivalents, and Marketable Securities [Table] *Documentation:*Cash, Cash Equivalents, and Marketable Securities [Table] *References:*NONE *Name:* abc:CashCashEquivalentsAndMarketableSecuritiesTable	1
7	Changes in Stockholders' Equity [Table]	abc	*Filer label:*Changes in Stockholders' Equity [Table] *Documentation:*Changes in Stockholders' Equity [Table] *References:*NONE *Name:* abc:ChangesInStockholdersEquityTable	2
8	Class of Treasury Stock [Table]	us-gaap	*Standard label:*Class of Treasury Stock [Table] *Documentation:*Different classes of treasury stock along with the different attributes of the treasury stock. *References:*NONE	1

HINT: Note that a [Table] is implemented as an XML Schema element, just like an [Axis], [Member], [Line Items], and Concept. Each of these report element types must have properties (which are implemented as XML Schema attributes) of type, and period. Each [Table] must be abstract and have the substitutionGroup xbrldt:hypercubeItem. However, this information is syntax; not semantics. These required but meaningless properties can be automatically verified by software and can therefore be ignored by a business user who is using appropriately implemented software.

16.10.9. Table properties

The [Table] properties visualization provides a more detailed listing of [Table] properties.

Name: us-gaap:NonmonetaryTransactionByTypeTable

Report Element Properties

Report Standard Label	Nonmonetary Transaction, by Type [Table]
Base Taxonomy Standard Label	Nonmonetary Transaction, by Type [Table]
Documentation	Transactions involving exchanges with other entities that involve principally nonmonetary assets or liabilities or relate to a transfer of nonmonetary assets for which the Entity receives no assets in return.
Report Element Class	Table
Prefix (From Taxonomy)	us-gaap
Name	us-gaap:NonmonetaryTransactionByTypeTable
ID	us-gaap_NonmonetaryTransactionByTypeTable

Labels of Report Element

From	Role	Label	Lang
Filer	Standard label	Nonmonetary Transaction, by Type [Table]	en-US
Base	Standard label	Nonmonetary Transaction, by Type [Table]	en-US

References of Report Element

Publisher	Reference Name	Reference Information

Name: abc:SelectFinancialInformationTable

16.10.10. Axes

The axes visualization provides a listing of all [Axis] and the properties of a [Axis].

Axes

#	Label	Prefix	Standard label, Documentation, References, Concept name	Count
1	Business Segments [Axis]	us-gaap	*Standard label:*Business Segments [Axis] *Documentation:*Information by business segments. *References:*NONE *Name:* us-gaap:StatementBusinessSegmentsAxis	1
2	Cash and Cash Equivalents Type [Axis]	us-gaap	*Standard label:*Cash and Cash Equivalents [Axis] *Documentation:*Information by type of cash and cash equivalent balance. *References:*NONE *Name:* us-gaap:CashAndCashEquivalentsAxis	1
3	Class of Stock [Axis]	us-gaap	*Standard label:*Class of Stock [Axis] *Documentation:*Information by the different classes of stock of the entity. *References:*NONE *Name:* us-gaap:StatementClassOfStockAxis	4
4	Debt Instrument [Axis]	us-gaap	*Standard label:*Debt Instrument [Axis] *Documentation:*Information by type of debt instrument, including, but not limited to, draws against credit facilities. *References:*NONE *Name:* us-gaap:DebtInstrumentAxis	1
5	Geographic Area [Axis]	us-gaap	*Standard label:*Geographical [Axis] *Documentation:*Information by geographical segments. *References:*NONE *Name:* us-gaap:StatementGeographicalAxis	1
6	Instrument Type [Axis]	us-gaap	*Standard label:*Instrument [Axis] *Documentation:*Information categorized by legal agreement. *References:*NONE *Name:* us-gaap:InstrumentAxis	1
7	Legal Entity [Axis]	dei	*Standard label:*Legal Entity [Axis] *Documentation:*The set of legal entities associated with a report. *References:*NONE	31

HINT: Note that the reporting entity axis which is implemented as the XBRL instance context element identifier and the period axis also implemented as an XBRL instance are both semantically just like any other [Axis]. These two quasi-[Axis] are not shown in the above listing.

16.10.11. Axes properties

The [Axis] properties visualization provides a more detailed listing of [Axis] properties.

Report Element Properties

Report Standard Label	Legal Entity [Axis]
Base Taxonomy Standard Label	Legal Entity [Axis]
Documentation	The set of legal entities associated with a report.
Report Element Class	Axis
Prefix (From Taxonomy)	dei
Name	dei:LegalEntityAxis
ID	dei_LegalEntityAxis

Labels of Report Element

From	Role	Label	Lang
Filer	Standard label	Legal Entity [Axis]	en-US
Base	Standard label	Legal Entity [Axis]	en-US

References of Report Element

Publisher	Reference Name	Reference Information

16.10.12. Members

The members visualization provides a listing of all [Member]s and the properties of a [Member].

Members

#	Label	Prefix	Standard label, Documentation, References, Concept name	Count
1	Actual [Domain]	us-gaap	*Standard label:* Scenario, Actual [Member] *Documentation:* Domain member used to indicate actual financial results. *References:* NONE *Name:* us-gaap:ScenarioActualMember	1
2	Advertising Barter Transactions [Member]	us-gaap	*Standard label:* Advertising Barter Transactions [Member] *Documentation:* Transactions in which there is a nonmonetary exchange of advertising, or the rights to place advertising, advertising is swapped for equal amounts of cash, or advertising is exchanged for other goods and services. *References:* NONE *Name:* us-gaap:AdvertisingBarterTransactionsMember	1
3	All Business Segments [Domain]	us-gaap	*Standard label:* Segment [Domain] *Documentation:* A component of an enterprise representing facts about an entire consolidated business entity disaggregated by business or economic activities. *References:* NONE *Name:* us-gaap:SegmentDomain	1
4	All geographic areas [Domain]	us-gaap	*Standard label:* Segment, Geographical [Domain] *Documentation:* The name of a geographic segment representing facts about a reporting entity disaggregated by the geographic area of the entities activities. This element may be used to identify operations in an individual country or group of countries depending on materiality. If a Geographical segment is an individual country use the countries defined in the Country Domain (Domain -2000) to identify the country segment. *References:* NONE *Name:* us-gaap:SegmentGeographicalDomain	1
5	Bank time deposits [Member]	us-gaap	*Standard label:* Bank Time Deposits [Member] *Documentation:* Certificates of deposit (CD) or savings accounts with a fixed term or understanding the customer can only withdraw by giving advanced notice with a bank or other financial institution. A CD is a short to medium-term investment available at banks and savings and loan institutions where a customer agrees to lend money to the institution for a certain amount of time and is paid a predetermined rate of interest. *References:* NONE *Name:* us-gaap:BankTimeDepositsMember	2
6	Business Segment Alpha [Member]	abc	*Filer label:* Business Segment Alpha [Member] *Documentation:* Business Segment Alpha [Member] *References:* NONE *Name:* abc:BusinessSegmentAlphaMember	1
7	Business Segment Bravo [Member]	abc	*Filer label:* Business Segment Bravo [Member] *Documentation:* Business Segment Bravo [Member] *References:* NONE	1

HINT: Note that a [Domain] is a type of [Member].

16.10.13. Members properties

The [Member] properties visualization provides a more detailed listing of [Member] properties.

Report Element Properties

Report Standard Label	All geographic areas [Domain]
Base Taxonomy Standard Label	Segment, Geographical [Domain]
Documentation	The name of a geographic segment representing facts about a reporting entity disaggregated by the geographic area of the entities activities. This element may be used to identify operations in an individual country or group of countries depending on materiality. If a Geographical segment is an individual country use the countries defined in the Country Domain (Domain -2000) to identify the country segment.
Report Element Class	Domain
Prefix (From Taxonomy)	us-gaap
Name	us-gaap:SegmentGeographicalDomain
ID	us-gaap_SegmentGeographicalDomain

Labels of Report Element

From	Role	Label	Lang
Filer	Standard label	All geographic areas [Domain]	en-US
Base	Standard label	Segment, Geographical [Domain]	en-US

References of Report Element

Publisher	Reference Name	Reference Information

16.10.14. Line items

The line items visualization provides a listing of all [Line Items] and the properties of the [Line Items].

Line Items

#	Label	Prefix	Standard label, Documentation, References, Concept name	Count
1	Balance Sheet [Line Items]	abc	*Filer label:*Balance Sheet [Line Items] *Documentation:*Balance sheet line items. *References:*NONE *Name:* abc:BalanceSheetLineItems	1
2	Balance Sheet Parenthetical, General [Line Items]	abc	*Filer label:*Balance Sheet Parenthetical, General [Line Items] *Documentation:*Balance Sheet Parenthetical, General [Line Items] *References:*NONE *Name:* abc:BalanceSheetParentheticalGeneralLineItems	1
3	Cash and Cash Equivalents [Line Items]	us-gaap	*Standard label:*Cash and Cash Equivalents [Line Items] *Documentation:*Line items represent financial concepts included in a table. These concepts are used to disclose reportable information associated with domain members defined in one or many axes to the table. *References:*NONE *Name:* us-gaap:CashAndCashEquivalentsLineItems	1
4	Cash Flow Statement [Line Items]	abc	*Filer label:*Cash Flow Statement [Line Items] *Documentation:*Cash Flow Statement [Line Items] *References:*NONE *Name:* abc:CashFlowStatementLineItems	1
5	Cash, Cash Equivlents, and Marketable Securities [Line Items]	abc	*Filer label:*Cash, Cash Equivlents, and Marketable Securities [Line Items] *Documentation:*Cash, Cash Equivlents, and Marketable Securities [Line Items] *References:*NONE *Name:* abc:CashCashEquivlentsAndMarketableSecuritiesLineItems	1
6	Changes in Stockholders' Equity [Line Items]	abc	*Filer label:*Changes in Stockholders' Equity [Line Items] *Documentation:*Changes in Stockholders' Equity [Line Items] *References:*NONE *Name:* abc:ChangesInStockholdersEquityLineItems	2
7	Class of Stock [Line Items]	us-gaap	*Standard label:*Class of Stock [Line Items] *Documentation:*Line items represent financial concepts included in a table. These concepts are used to disclose reportable information associated with domain members defined in one or many axes to the table. *References:*NONE	2

HINT: Note that the [Line Items] is basically an axis for the concept which is basically the member for the line items axis.

16.10.15. Line items properties

The [Line Items] properties visualization provides a more detailed listing of the [Line Items] properties.

Report Element Properties

Report Standard Label	Debt Instrument [Line Items]
Base Taxonomy Standard Label	Debt Instrument [Line Items]
Documentation	Line items represent financial concepts included in a table. These concepts are used to disclose reportable information associated with domain members defined in one or many axes to the table.
Report Element Class	Line Items
Prefix (From Taxonomy)	us-gaap
Name	us-gaap:DebtInstrumentLineItems
ID	us-gaap_DebtInstrumentLineItems

Labels of Report Element

From	Role	Label	Lang
Filer	Standard label	Debt Instrument [Line Items]	en-US
Base	Standard label	Debt Instrument [Line Items]	en-US

References of Report Element

Publisher	Reference Name	Reference Information

16.10.16. Abstract

The abstract visualization provides a listing of all report elements whose only purpose is to organize other report elements.

Abstracts

#	Label	Prefix	Standard label, Documentation, References, Concept name	Count
1	Adjustments to reconcile to cash provided by operations [Roll Up]	us-gaap	*Standard label:*Adjustments to Reconcile Net Income (Loss) to Cash Provided by (Used in) Operating Activities [Abstract] *Documentation:*Adjustments to reconcile to cash provided by operations [Roll Up] *References:*NONE *Name:* us-gaap:AdjustmentsToReconcileNetIncomeLossToCashProvidedByUsedInOperatingActivitiesAbstract	1
2	Assets [Roll Up]	us-gaap	*Standard label:*Assets [Abstract] *Documentation:*Assets [Roll Up] *References:*NONE *Name:* us-gaap:AssetsAbstract	1
3	Balance Sheet Parenthetical General [Hierarchy]	abc	*Filer label:*Balance Sheet Parenthetical General [Hierarchy] *Documentation:*Balance Sheet Parenthetical General [Hierarchy] *References:*NONE *Name:* abc:BalanceSheetParentheticalGeneralHierarchy	1
4	Business Segment Information [Hierarchy]	abc	*Filer label:*Business Segment Information [Hierarchy] *Documentation:*Business Segment Information [Hierarchy] *References:*NONE *Name:* abc:BusinessSegmentInformationHierarchy	1
5	CANADA	country	*Standard label:*CANADA *Documentation:*CANADA *References:*NONE *Name:* country:CA	1
6	Cash and Cash Equivalents [Hierarchy]	abc	*Filer label:*Cash and Cash Equivalents [Hierarchy] *Documentation:*Cash and Cash Equivalents [Hierarchy] *References:*NONE *Name:* abc:CashCashEquivalentsHierarchy	1
7	Cash and Cash Equivalents [Roll Forward]	abc	*Filer label:*Cash and Cash Equivalents [Roll Forward] *Documentation:*Cash and Cash Equivalents [Roll Forward] *References:*NONE *Name:* abc:CashCashEquivalentsRollForward	1

HINT: Note that abstract report elements can never be reported and therefore the data type, period type, and balance are semantically meaningless properties. The term "abstract" as used here is not the same as the use of the XBRL technical syntax attribute "abstract".

16.10.17. Abstract properties

The abstract properties visualization provides a more detailed listing of the abstract report element properties.

Report Element Properties

Report Standard Label	Changes in working capital items [Abstract]
Base Taxonomy Standard Label	Increase (Decrease) in Operating Capital [Abstract]
Documentation	Changes in working capital items [Abstract]
Report Element Class	Abstract
Prefix (From Taxonomy)	us-gaap
Name	us-gaap:IncreaseDecreaseInOperatingCapitalAbstract
ID	us-gaap_IncreaseDecreaseInOperatingCapitalAbstract

Labels of Report Element

From	Role	Label	Lang
Filer	Standard label	Changes in working capital items [Abstract]	en-US
Base	Standard label	Increase (Decrease) in Operating Capital [Abstract]	en-US

References of Report Element

Publisher	Reference Name	Reference Information

16.10.18. Concepts

The concepts visualization provides a listing of all concepts and the properties of the concept.

Concepts

#	Label	Data Type	Period Type	Balance Type	Prefix	Standard label, Documentation, References, Concept name	Count
1	2014	Monetary	As Of (instant)	Credit	us-gaap	*Standard label:*Long-term Debt, Maturities, Repayments of Principal in Year Two *Documentation:*Amount of long-term debt, sinking fund requirements, and other securities redeemable at fixed or determinable prices and dates maturing in the second fiscal year following the latest fiscal year. *References:*NONE *Name:* us-gaap:LongTermDebtMaturitiesRepaymentsOfPrincipalInYearTwo	1
2	2015	Monetary	As Of (instant)	Credit	us-gaap	*Standard label:*Long-term Debt, Maturities, Repayments of Principal in Year Three *Documentation:*Amount of long-term debt, sinking fund requirements, and other securities redeemable at fixed or determinable prices and dates maturing in the third fiscal year following the latest fiscal year. *References:*NONE *Name:* us-gaap:LongTermDebtMaturitiesRepaymentsOfPrincipalInYearThree	1
3	2016	Monetary	As Of (instant)	Credit	us-gaap	*Standard label:*Long-term Debt, Maturities, Repayments of Principal in Year Four *Documentation:*Amount of long-term debt, sinking fund requirements, and other securities redeemable at fixed or determinable prices and dates maturing in the fourth fiscal year following the latest fiscal year. *References:*NONE *Name:* us-gaap:LongTermDebtMaturitiesRepaymentsOfPrincipalInYearFour	1
4	2017	Monetary	As Of (instant)	Credit	us-gaap	*Standard label:*Long-term Debt, Maturities, Repayments of Principal in Year Five *Documentation:*Amount of long-term debt, sinking fund requirements, and other securities redeemable at fixed or determinable prices and dates maturing in the fifth fiscal year following the latest fiscal year. *References:*NONE *Name:* us-gaap:LongTermDebtMaturitiesRepaymentsOfPrincipalInYearFive	1
5	Accounts payable	Monetary	As Of (instant)	Credit	us-gaap	*Standard label:*Accounts Payable, Current *Documentation:*Carrying value as of the balance sheet date of liabilities incurred (and for which invoices have typically been received) and payable to vendors for goods and services received that are used in an entity's business. Used to reflect the current portion of the liabilities (due within one year or within the normal operating cycle if longer). *References:*NONE *Name:* us-gaap:AccountsPayableCurrent	1
6	Accounts payable	Monetary	For Period (duration)	Debit	us-gaap	*Standard label:*Increase (Decrease) in Accounts Payable *Documentation:*The increase (decrease) during the reporting period in the aggregate amount of liabilities incurred (and for which invoices have typically been received) and payable to vendors for goods and services received that are used in an entity's business. *References:*NONE *Name:* us-gaap:IncreaseDecreaseInAccountsPayable	1
7	Accounts receivable	Monetary	For Period (duration)	Credit	us-gaap	*Standard label:*Increase (Decrease) in Accounts Receivable *Documentation:*The increase (decrease) during the reporting period in amount due within one year (or one business cycle) from customers for the credit sale of goods and services. *References:*NONE	1

HINT: Note that only concepts have balance type, period type, and data type which are meaningful semantically.

16.10.19. Concept properties

The concept properties visualization provides a more detailed listing of concept properties.

Report Element Properties

Report Standard Label	Inventories
Base Taxonomy Standard Label	Inventory, Net
Documentation	Carrying amount (lower of cost or market) as of the balance sheet date of inventories less all valuation and other allowances. Excludes noncurrent inventory balances (expected to remain on hand past one year or one operating cycle, if longer).
Report Element Class	Concept
Prefix (From Taxonomy)	us-gaap
Balance Type	Debit
Period Type	As Of (instant)
Data Type	Monetary (xbrli:monetaryItemType)
Name	us-gaap:InventoryNet
ID	us-gaap_InventoryNet

Labels of Report Element

From	Role	Label	Lang
Filer	Standard label	Inventories	en-US
Base	Standard label	Inventory, Net	en-US
Filer	Total label	Total inventories, net	en-US
Base	Total label	Inventory, Net, Total	en-US

References of Report Element

Publisher	Reference Name	Reference Information
FASB	Accounting Standards Codification	Section: 35 Topic: 330 URI: http://asc.fasb.org/extlink&oid=6386567&loc=d3e3927-108312

16.10.20. Component model structure (for each component)

The component structural relations visualization provides a listing of the relations between the report elements which make up a component.

Component: (Network and Table)	
Network	4020 - Disclosure - Significant Accounting Policies (http://www.abc.com/role/SignificantAccountingPolicies)
Table	Significant Accounting Policies [Table]

#	Label	Report Element Class	Period Type	Balance	Name
1	**Significant Accounting Policies [Table]**	[Table]			abc:SignificantAccountingPoliciesTable
2	**Legal Entity [Axis]**	[Axis]			dei:LegalEntityAxis
3	Consolidated Entity [Domain]	[Domain]			dei:EntityDomain
4	**Significant Accounting Policies [Line Items]**	[Line Items]			abc:SignificantAccountingPoliciesLineItems
5	Cash and cash equivalents policy [Text Block]	[Concept] String	For Period		us-gaap:CashAndCashEquivalentsPolicyTextBlock
6	Receivables policy [Text Block]	[Concept] String	For Period		us-gaap:ReceivablesPolicyTextBlock
7	Inventories policy [Text Block]	[Concept] String	For Period		us-gaap:InventoryPolicyTextBlock
8	Debt policy [Text Block]	[Concept] String	For Period		us-gaap:DebtPolicyTextBlock
9	Revenue recognition policy [Text Block]	[Concept] String	For Period		us-gaap:RevenueRecognitionPolicyTextBlock

16.10.21. Component model structural relations report element properties

The component structural relations contain report elements. Key properties of each report element can be seen on the visualization. All report properties are provided by the report element properties. For example, this is the properties of the first report element:

Report Element Properties

Report Standard Label	Cash and cash equivalents policy [Text Block]
Base Taxonomy Standard Label	Cash and Cash Equivalents, Policy [Policy Text Block]
Documentation	Disclosure of accounting policy for cash and cash equivalents, including the policy for determining which items are treated as cash equivalents. Other information that may be disclosed includes (1) the nature of any restrictions on the entity's use of its cash and cash equivalents, (2) whether the entity's cash and cash equivalents are insured or expose the entity to credit risk, (3) the classification of any negative balance accounts (overdrafts), and (4) the carrying basis of cash equivalents (for example, at cost) and whether the carrying amount of cash equivalents approximates fair value.
Report Element Class	Concept
Prefix (From Taxonomy)	us-gaap
Balance Type	
Period Type	For Period (duration)
Data Type	String (xbrli:stringItemType, nonnum:textBlockItemType)
Name	us-gaap:CashAndCashEquivalentsPolicyTextBlock
ID	us-gaap_CashAndCashEquivalentsPolicyTextBlock

Labels of Report Element

From	Role	Label	Lang
Filer	Standard label	Cash and cash equivalents policy [Text Block]	en-US
Base	Standard label	Cash and Cash Equivalents, Policy [Policy Text Block]	en-US

References of Report Element

Publisher	Reference Name	Reference Information

HINT: This is a duplication, the report element properties where shown previously.

16.10.22. Component fact table (for each component)

The component fact table visualization provides a listing of the facts which make up the component.

Fact Table Summary

Component: (Network and Table)	
Network	1100 - Document - Document Information (http://www.abc.com/role/DocumentInformation)
Table	Document Information [Table]

#	Reporting Entity	Period	Legal Entity [Axis]	Concept	Value	Unit	Rounding	Parenthetical Explanations
1	0000000001 (http://www.sec.gov/CIK)	2012-01-01 - 2012-12-31	Consolidated Entity [Domain]	Document period end date	2012-12-31			
2	0000000001 (http://www.sec.gov/CIK)	2012-01-01 - 2012-12-31	Consolidated Entity [Domain]	Amendment flag	false			
3	0000000001 (http://www.sec.gov/CIK)	2012-01-01 - 2012-12-31	Consolidated Entity [Domain]	Document fiscal period focus	FY			
4	0000000001 (http://www.sec.gov/CIK)	2012-01-01 - 2012-12-31	Consolidated Entity [Domain]	Document fiscal year focus	2012			
5	0000000001 (http://www.sec.gov/CIK)	2012-01-01 - 2012-12-31	Consolidated Entity [Domain]	Document type	10-K			1

HINT: The fact table is useful for quickly scanning a component for items which stand out when compared to other items in the same component.

16.10.23. Component fact table, fact characteristics and properties

The fact characteristics and properties visualization focuses on the characteristics and properties for one specific fact. Provided are the characteristics of the fact, the fact value, traits of the fact if the fact is numeric and parenthetical explanations for the face.

Fact Properties

Characteristic, trait or fact	Value of characteristic, trait, or fact
Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Period	2012-01-01 - 2012-12-31
Legal Entity [Axis]	Consolidated Entity [Domain]
Concept	Document period end date
Fact value	2012-12-31
Units	
Decimals (rounding)	
Parenthetical explanation (i.e. footnote)	(None)

HINT: While not necessary because the component rendering provides all this information, it is helpful to sometimes have fact information provided in this manner.

16.10.24. Fact parenthetical explanations

The fact parenthetical explanations visualization shows the parenthetical explanations related to a particular fact.

Parenthetical Explanation

Proin elit sem, ornare non, ullamcorper vel, sollicitudin a, lacus. Mauris tincidunt cursus est. Nulla sit amet nibh. Sed elementum feugiat augue. Nam non tortor non leo porta bibendum. Morbi eu pede. In eu erat et est feugiat fermentum. Praesent accumsan. Nulla convallis, lorem nec aliquet dapibus, libero felis sagittis augue, ut adipiscing nisl eros in quam. Fusce eleifend. Sed justo nibh, placerat a, malesuada nec, condimentum ac, magna.

HINT: Parenthetical explanations make more sense when viewed from the perspective of the component.

16.10.25. Component semantic rendering (for each component)

The component semantic rendering visualization provides information about the facts, characteristics of the facts, traits of the fact, and parenthetical explanations which further explain the facts of a component.

Component: (Network and Table)	
Network	5040 - Disclosure - Inventory Components (http://www.abc.com/role/InventoryComponents)
Table	Inventory Components [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Inventory Components [Line Items]	Period	
	2012-12-31	2011-12-31
Inventory, Net [Roll Up]		
Finished Goods	1,000,000	1,000,000
Work in progress	1,000,000	1,000,000
Raw materials	1,000,000	1,000,000
Other	1,000,000	1,000,000
Total inventories, net	4,000,000	4,000,000

HINT: The semantic rendering provides all the information of the structural relations and all the information of the fact table combined with other knowledge of how to properly render information models and member aggregation models into a properly formatted, human readable, semantic rendering.

16.10.26. Component fact or characteristic properties (for any fact or characteristic of component)

The component fact properties visualization shows the properties of a selected fact (when a fact is selected). The characteristic properties show the properties for the selected report element (when a report element is selected).

Here you see the fact which expresses total inventories for 2012 for the consolidated entity expressed in US dollars for the reporting entity shown:

Fact Properties

Characteristic, trait or fact	Value of characteristic, trait, or fact
Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Period	2012-12-31
Legal Entity [Axis]	Consolidated Entity [Domain]
Concept	Inventories
Fact value	4000000
Units	USD
Decimals (rounding)	-3
Parenthetical explanation (i.e. footnote)	(None)

Here you see the properties of the characteristic "Concept" which has the value of "Inventories":

Report Element Properties

Report Standard Label	Inventories
Base Taxonomy Standard Label	Inventory, Net
Documentation	Carrying amount (lower of cost or market) as of the balance sheet date of inventories less all valuation and other allowances. Excludes noncurrent inventory balances (expected to remain on hand past one year or one operating cycle, if longer).
Report Element Class	Concept
Prefix (From Taxonomy)	us-gaap
Balance Type	Debit
Period Type	As Of (instant)
Data Type	Monetary (xbrli:monetaryItemType)
Name	us-gaap:InventoryNet
ID	us-gaap_InventoryNet

Labels of Report Element

From	Role	Label	Lang
Filer	Standard label	Inventories	en-US
Base	Standard label	Inventory, Net	en-US
Filer	Total label	Total inventories, net	en-US
Base	Total label	Inventory, Net, Total	en-US

References of Report Element

Publisher	Reference Name	Reference Information

Another characteristic of fact, the legal entity:

Report Element Properties

Report Standard Label	Legal Entity [Axis]
Base Taxonomy Standard Label	Legal Entity [Axis]
Documentation	The set of legal entities associated with a report.
Report Element Class	Axis
Prefix (From Taxonomy)	dei
Name	dei:LegalEntityAxis
ID	dei_LegalEntityAxis

Labels of Report Element

From	Role	Label	Lang
Filer	Standard label	Legal Entity [Axis]	en-US
Base	Standard label	Legal Entity [Axis]	en-US

References of Report Element

Publisher	Reference Name	Reference Information

Characteristic value, member of legal entity characteristic, consolidated entity:

Report Element Properties

Report Standard Label	Consolidated Entity [Domain]
Base Taxonomy Standard Label	Entity [Domain]
Documentation	All the names of the entities being reported upon in a document. Any legal structure used to conduct activities or to hold assets. Some examples of such structures are corporations, partnerships, limited liability companies, grantor trusts, and other trusts. This item does not include business and geographical segments which are included in the geographical or business segments domains.
Report Element Class	Domain
Prefix (From Taxonomy)	dei
Name	dei:EntityDomain
ID	dei_EntityDomain

Labels of Report Element

From	Role	Label	Lang
Filer	Standard label	Consolidated Entity [Domain]	en-US
Base	Standard label	Entity [Domain]	en-US

References of Report Element

Publisher	Reference Name	Reference Information

16.10.27. Component business rule relations (for each component)

The business rules relations visualization shows the business rules for a component.

Business Rules

Component: (Network and Table)	
Network	2001 - Statement - Balance Sheet (http://www.abc.com/role/BalanceSheet)
Table	Balance Sheet [Table]

Assertion Report

Existence Assertions

ID	Satisfied
ASSERTION_Exists_Assets2 (evaluations 1)	Satisfied
ASSERTION_Exists_LiabilitiesAndEquity (evaluations 1)	Satisfied
ASSERTION_Exists_CurrentAssets (evaluations 1)	Satisfied
ASSERTION_Exists_Equity (evaluations 1)	Satisfied
ASSERTION_Exists_CurrentLiabilities (evaluations 1)	Satisfied

Value Assertions

ID	Satisfied
ASSERTION_Balances_BalanceSheet (evaluations 2)	Satisfied

XBRL Calculations

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Period	2012-12-31
Measure	USD
Legal Entity [Axis]	Consolidated Entity [Domain]

Label	Rendered		Reported	Calculated	Balance	Decimals	Message
Assets [Roll Up]							
Current assets [Roll Up]							
Cash, Cash Equivalents, and Short-term Investments [Roll Up]							
Cash and cash equivalents	11,000,000	+	11,000,000	11,000,000	DR	-3	
Marketable securities	9,000,000	+	9,000,000	9,000,000	DR	-3	
Cash, Cash Equivalents, and Short-term Investments	20,000,000	+	20,000,000	20,000,000	DR	-3	OK
Accounts receivable, net of allowance for doubtful accounts of $1,000 and $1,000	29,000,000	+	29,000,000	29,000,000	DR	-3	
Inventories	4,000,000	+	4,000,000	4,000,000	DR	-3	
Prepaid expenses	3,000,000	+	3,000,000	3,000,000	DR	-3	
Current assets	56,000,000	+	56,000,000	56,000,000	DR	-3	OK
Noncurrent assets [Roll Up]							
Property, plant and equipment, net	82,000,000	+	82,000,000	82,000,000	DR	-3	
Deferred costs	9,000,000	+	9,000,000	9,000,000	DR	-3	
Noncurrent assets	91,000,000	+	91,000,000	91,000,000	DR	-3	OK
Assets	147,000,000		147,000,000	147,000,000	DR	-3	OK

16.11. *Business rule relations properties*

The business rules relations have properties which depend on the class of business rule. This is the important information for determining the properties of business rule type relations for the different classes of business rules. Business rules can be broken down into the following categories:

- Roll up

- Roll forward
- Adjustment
- Variance
- Member aggregation
- Complex computation
- Existence of a fact
- Equality of two facts
- Fact greater than or less than another fact
- Dependency of a fact (if Fact A exists, than Fact B must exist)
- Free form (i.e. any other supported business rule

The following is an example of the properties of a roll forward type business rule:

Business rule information:	
ID	Assertion_RollForward_PropertyPlantAndEquipmentNet
Type	Roll forward
Business rule label:	Property, plant and equipment roll forward must reconcile.
Formula/Function: (semantic, not syntax)	Beginning balance (Property, Plant and Equipment, Net) + Additions - Disposals - Depreciation + Other Changes = Ending balance (Property, plant and equipment, net)
Concept which rolls forward:	
Fact with this concept rolls forward: (beginning and ending)	Property, Plant and Equipment, Net (us-gaap:PropertyPlantAndEquipmentNet)
Set of changes to balance:	
Change 1 with this concept:	Additions (us-gaap:Additions)
Change 2 with this concept:	Disposals (us-gaap:Disposals)
Change 3 with this concept:	Depreciation (us-gaap:Depreciation)
Change 4 with this concept:	Other Changes (us-gaap:OtherChanges)

16.12. Verification risks and categories

The following is a summary of verification tasks and steps. We start first by identifying the risk which might cause a financial report to be invalid and ways to mitigate that risk.

16.12.1. Risks and risk mitigation

Below is a summary of the risks which could lead to a financial report being invalid and the risk mitigation assertion or verification task which would assure that the risk goes unrealized. Terminology of the *Financial Report Semantics and Dynamics Theory* (described above) is used to clearly state the report objects, relations, and properties which must be examined either using automated processes or manual processes to verify that object property. The risk and mitigation is independent of whether the verification task is performed by a party which is or is not independent.

Risk	Risk Mitigation Assertion (Verification task)
Full inclusion: All relevant facts, characteristics which describe facts, parenthetical explanations of facts, and relations between facts/characteristics are not included in the financial report.	**Completeness**: All relevant facts, characteristics of facts, parenthetical explanations of facts, and relations between facts/characteristics have been included.

Risk	Risk Mitigation Assertion (Verification task)
False inclusion: No facts, characteristics which describe facts, parenthetical explanations of facts, or relations between facts/characteristics which should not be included have been included.	**Existence**: No facts, characteristics which describe facts, parenthetical explanations of facts, relations between facts/characteristics are included within financial report which should not be included.
Inaccuracy: Property of a fact, characteristic, component, or relation is inaccurate. *(For example, mathematical relations and model logical structure relations.)*	**Accuracy**: The properties of all facts, characteristics, components, parenthetical explanations, relations between facts/characteristics which are included in the financial report are accurate, correct, and complete.
Infidelity: All facts, characteristics, parenthetical explanations, and relations considered as a whole do not possess the required fidelity when considered as a whole.	**Fidelity**: Considered as a whole; the facts, characteristics, parenthetical explanations, and relations between facts/characteristics properly reproduces the financial and nonfinancial facts, characteristics, and relations of the reporting entity and provide a true and fair representation of such financial information. Fidelity = faithful representation.
Integrity not intact: Integrity between facts/characteristics is inappropriate.	**Integrity**: Considered as a whole, the facts and characteristics of those facts reflect the true and proper relations between such facts and characteristics.
Inconsistency: The facts, characteristics, parenthetical explanations, relations and their properties expressed are inconsistent with prior reporting periods or with peers of the reporting entity.	**Consistency**: The facts, characteristics, parenthetical explanations, relations between facts/characteristics, and their properties are consistent with prior periods and with the reporting entities peers, as is deemed appropriate.
Not presented fairly: The financial report is not presented fairly, in all material respects, and are not a true and fair representation in accordance with the financial reporting framework applied.	**True and fair representation**: The financial report is a true and fair representation of the information of the reporting entity. An auditor might say presented fairly, in all material respects, and provide a true and fair representation in accordance with the financial reporting framework applied (US GAAP, IFRS, etc.).

16.12.2. Categories of Verification

Verification can be broken down in a number of different ways forming what might be seen as sets or groups of verification. These categories are important to understand as they determine how verification can be performed and who or how verification rules would be created.

The first important aspect of verification relates to how the process by which the risk mitigation task is carried out. There are two approaches:

- **Automated process:** Some verification can be automated using computer software applications.
- **Manual process:** Some verification must be carried out by humans manually. There are two reasons verification might need to be carried out manually by humans:
    - Verification step is not automatable.
    - Verification step is automatable; however the automatable verification rules necessary to achieve automated verification have not been created.

Basically, any verification task which is not or may not be automated must be verified manually.

Another aspect of verification is whether it relates to syntax or semantics. These are the categories for this aspect:

- **XBRL technical syntax**: SEC XBRL financial filings are of the XBRL technical syntax and thus XBRL technical validation would apply. XBRL technical syntax validation is 100% automatable because of the nature of the XBRL specification. XBRL technical syntax restrictions will generally be automatable, but it cannot be said at this time that syntax restrictions are 100% automated.
- **SEC EFM rules**: The SEC Edgar system defines certain rules digital financial reports must follow. These rules are broken down into two categories within the Edgar Filer Manual (EFM): syntax and semantics. For example, the EFM specifies how to identify the consolidated entity information within an SEC XBRL financial filing. SEC semantics rules are sometimes automatable and other times not automatable.
- **XBRL US consistency checks**: XBRL US provides a number of consistency checks to be sure information reported is correct. For example, certain facts should never be less than zero. Consistency checks automate the process of detecting these sorts of inconsistencies.
- **Report logical structure**: Report structure is defined by the US GAAP Taxonomy Architecture which expresses what a [Table] is, how a [Table] relates to an [Axis] and to a [Member], etc. These report elements can be organized logically or illogically and incorrectly. Any illogical, inconsistent, or ambiguous organization of these report elements is detected by automated report logical structure verification testing.
- **US GAAP Domain level rules**: US GAAP defines certain specific rules which are applicable to all reporting entities. For example, balance sheets report assets; balance sheets report liabilities and equity; balance sheets balance (assets = liabilities and equity); balance sheets foot; etc. These rules are the same for every reporting entity and therefore are considered domain level business rules.
- **Industry/Activity level rules**: All reporting entities for some specific industry or activity have the same business rules. For example, all commercial and industrial companies have classified balance sheets and therefore report current assets and current liabilities; whereas depository institutions report unclassified balance sheets.
- **Reporting entity specific rules**: All other US GAAP related business rules which are not the same for each reporting entity or are cannot be categorized into some specific industry/activity fall into the category of reporting entity specific rules. For example, aspects of how the cash flow statement foots is unique to a reporting entity.
- **Reportability rules**: A disclosure checklist is used by accountants to be sure all required disclosures are provided by a reporting entity and each disclosure provides the appropriate individual disclosure items. Many of these rules can be checked by a computer software application using "if-then" type reasoning. For example, if the line item property, plant, and equipment exists on the balance sheet one would expect certain specific policies and disclosures to be

provided. Many reportability type rules must be manually checked as they are impossible to automate.

- **Other rules and best practices**: This category is simply a summary category for any other rules or best practices which a reporting entity chooses to follow. For example, checking the spelling of a report is a type of rule which can be automated using software. Other rules and best practices must be checked manually.

16.13. Verification tasks and steps

The following is a set of verification tasks which must be performed in order to verify that a digital financial report expresses information correctly and appropriately as determined by a reporting entity. A digital financial report is a district set of discrete pieces. Each of these pieces must be checked. All properties of these pieces must be checked. Relations between the pieces must be checked and verified to be appropriate. Properties of the relations must be checked and verified to be appropriate.

Given that a digital financial report is a definitive, discrete, finite set of objects and their relations and properties and therefore verification of those pieces is likewise a set of definitive, discrete, and finite set of verification tests and tasks. This provides 100% coverage of the report objects. Again, verification may be manual or automated.

Financial report object	Verification task/steps
Financial report properties	1. Verify *financial report* object. a. Verify financial report object properties. i. Financial report document identifier property correct (target namespace). ii. Financial report dictionaries (taxonomies) correct. b. Verify full inclusion of financial report components. c. Verify false inclusion of financial report components.
Components	2. Verify financial report *components.* (For each component) a. Verify component properties correct. i. Sort code. ii. Type. iii. Title. iv. Identifier b. Verify full inclusion of component facts. c. Verify false inclusion of component facts. d. Correctness of component facts. e. Correctness integrity between components.
Fact characteristics and fact characteristic properties	3. Verify fact *characteristics.* (For each fact) a. Characteristics properties correct. i. Characteristic (i.e. [Axis], Reporting entity, Period, [Line Items], or other characteristic defined and added by reporting entity). ii. Characteristic value. iii. Characteristic properties (for Concepts only). 1. Data type. 2. Period type. 3. Balance type. b. Verify full inclusion of fact characteristics. c. Verify false inclusion of fact characteristics. d. Correctness of ordering of fact characteristics

Financial report object	Verification task/steps
Fact properties	4. Verify *fact* properties. (For each fact) a. Verify full inclusion of characteristics. b. Verify false inclusion of characteristics. c. Fact value accuracy. d. Fact value traits. i. Units. ii. Rounding (decimals). e. Verify full inclusion of parenthetical explanations. f. Verify false inclusion of parenthetical explanations.
Parenthetical explanations	5. Verify *parenthetical explanation* properties. (For each parenthetical explanation)
Model structural relations	6. Verify model structural *relations.* (For each model structural relationship) a. Correctness of report element model structural relationships. b. Verify full inclusion of model structural relations. c. Verify false inclusion of model structural relationship. d. Correctness or logic of model structural relationship properties. (For each property) e. Correctness or logic of report element properties. (For each report element involved in a model structural relationship)
Business rules relations	7. Verify business rules *relations.* (For each business rule type relationship) a. Correctness or logic of business rule relationship between report elements. (For each relationship) b. Verify full inclusion of business rule relationships. c. Verify false inclusion of business rule relationships.
Flow relations	8. Verify flow *relations* (ordering, sequence of components). a. Correctness or logic of component ordering, sequencing.
Report elements	9. Verify report element properties. (For each property) a. Report element properties are correct.

Note that the terms used above to describe financial report objects are from the *Financial Report Semantics and Dynamics Theory* which provides a precise definition of each object.

Note that if a financial report at some point "T1" is verified to be 100% correct, it is not necessary to re-verify each piece of the report at some future point "T2". It is only necessary to verify the changes between point "T1" and point "T2". This strategy can be used to when reviewing a subsequent version of a digital financial report or even between two different reporting periods. For example, if between Q1 and Q2 only the reported fact change but no characteristics, relations, or other things change what needs to be reviewed manually can be substantially reduced.

16.14. Role of software in verification process

Computer software will play a major role in the verification of the information expressed by a digital financial report, helping its creator know that the story they

are telling with their financial report is verifiably a true and fair representation of the reporting entities information and the financial story the creator intended to tell.

The best software will be both invisible to the user of the software but assist the user understand exactly what they are responsible for. Creation of a digital financial report cannot be a "black box" or where a business user does his or her best and hopes it will fulfil their obligation and meet their legal responsibility. No paper-based financial report would ever have been released under those terms.

The best digital financial report creation software will both assist the creator of the report verify all aspects of the financial report during the creation process within the creation software used to create the financial report. The business user will have complete transparency into what the software is doing using automated processes and integrated processes for managing the manual verification tasks.

Other verification software will be stand-alone and be independent of the actual creation process. For example, it is likely that internal and external auditors will use software which is not integrated with the creation process.

The following is a summary of functionality which is necessary within software designed to assist a business user in the process of verification of a digital financial report such as an SEC XBRL-based financial filing:

- **Technical syntax validation**. Digital financial reports are ultimately expressed using some technical syntax. For example, SEC XBRL-based financial reports are formatted in the XBRL technical syntax which uses XBRL 2.1 and XBRL Dimensions. Filers might also choose to use XBRL Formula to express and test business rules. As such, verification software clearly needs to be able to provide feedback to the user that XBRL which has been created complies with the XBRL technical specifications. Such software should be shown to pass the XBRL 2.1, XBRL Dimensions 1.0, and the XBRL Formula conformance suite tests. As 100% of technical syntax verification can be automated, the business user really should never need to manually verify technical syntax. Creation software should simply create nothing other than proper XBRL.
- **SEC Edgar Filer Manual (EFM) rules validation**. The SEC EFM places specific additional technical syntax restrictions on how you are allowed to use XBRL. The EFM also has a number of semantic rules and restrictions. Business professionals will need to verify that their SEC XBRL-based financial report against these rules. Many EFM rules can be automatically verified but others need to be manually verified.
- **Report logical structure verification**. The US GAAP taxonomy specifies how to construct the model you use to represent your financial report. It uses report elements such as [Table]s, [Axis], [Member]s, [Line Items], networks, concepts, and abstracts in specific, logical ways. (See section 4.5 of the US GAAP Taxonomy Architecture.) Software must be able to help business user not create illogical, inconsistent, or ambiguous models which cause misinterpretation of their digital financial report. For example, inconsistencies between the XBRL definition relations, calculation relations, and presentation relations can cause illogical and misinterpret relations. Software can easily verify that you are creating logical, consistent, and unambiguous information using automated testing.
- **Business rules engine for processing business rules**. XBRL Formula is one type of global standard rules engine which can be used to express

business rules which can be used to verify both mathematical type relations and other types of relations expressed in your digital financial reports. A business rules engine of some type is necessary because the relations expressed in digital financial reports go beyond the simplistic relations verified by XBRL calculations. As such, digital financial report creation and verification software needs to provide this functionality. Alternatively, creation software might take the approach of generating business rules from the actual model which is created.

- **US GAAP domain level and industry/activity level rules validation**. US GAAP had both domain level business rules which every digital financial report must follow, such as assets = liabilities and equity, and industry/activity level business rules, such as commercial and industrial companies must provide classified balance sheets which report current assets and current liabilities. Verification software and creation software should support these business rule groups.
- **Creation of business rules by business professionals**. Every digital financial report will have its own reporting entity specific business rules. As such, creation software and/or verification software must enable the business professionals creating these digital financial reports to create and otherwise manage their unique business rules. Alternatively, creation software could auto-generate these business rules. Complex and difficult to use technical tools will not meet the needs of business professionals.
- **Understandable and otherwise appropriate views of financial report semantic objects, relations, properties**. Software needs to provide views of report element and their properties in ways that are understandable to business professionals. XBRL technical syntax oriented views of report objects is not appropriate and unnecessary. Business meaning is what is important to business professionals, not technical syntax which they will never understand, nor should they need to understand. Semantic views, as outlined in this document, are what is necessary. The many views necessary must support both automated and manual verification of information within the SEC XBRL financial report.
- **Understandable and well organized navigation between financial report objects, relevant properties, and relevant relations**. Financial report objects are related to other objects and have properties which business professionals need to examine. As such, appropriate navigation between the sometimes thousands of report objects, their relations and their properties is necessary. Again, the report objects necessary are the ones which provide meaning to business professionals, not the technical syntax objects. Mixing semantic type objects and syntax type objects is likewise inappropriate. A well-organized interface both exposes and leverages the intersections between the many financial report objects.
- **Understandable semantic renderings**. For renderings of the information to be understandable, they must be shown correctly to the business user. There are exactly two reasons for bad renderings: (1) bad models, (2) bad rendering engines. If the rendering engine is good, then the only reason for a bad rendering is a bad model which can be both identified and then fixed. One thing most rendering engines do not do well at this time is leverage the information models of the information being modeled. Roll ups, roll forwards, adjustments, variances, hierarchies, and other information models have characteristics which software vendors could leverage in their rendering software to improve what business professionals see and have to therefore

work with. Also, all information should be shown by software, not just some information. Appropriate semantic renderings are a basis for appropriate views of information, appropriate navigation between components, and the ability to effectively verify a digital financial report.

- **SEC interactive data rendering**. While it is much more likely that an SEC XBRL financial filing will be viewed within software other than the SEC interactive data viewer; business professionals still want to understand how their filing will look on the SEC web site. As such, verification software should include an SEC interactive data rendering within the verification software.
- **Support for tracking/managing both automated and manual validation tasks and steps**. Not all verification tasks or steps can be automated. As such, verification of a digital financial report, such as an SEC XBRL-based financial filing, will always be a combination of automated and manual tasks/steps. As such, software supporting a business user in the verification process needs to help the business user manage both automated and manual verification tasks/steps.
- **Comprehensive and useful set of verification reports and appropriate verification evidence package**. Business professionals need to be able to print many of the same views provided by software applications used to visualize a digital financial report. Quantity of reports is not what is important, quality is what is important. Well thought out and well organized reports which can be used both for verification of digital financial reports and for providing a historical archive, or evidence package, for a financial filing.
- **Transparency into what the software is automatically verifying so manual verification work can be properly planned**. Verification of a digital financial report such as an SEC XBRL-based financial report should not be a "black box". At the very least, business professionals need to understand exactly what automated verification steps software performs so that they can properly plan their manual tasks/steps required to supplement automated verification. As such, business professionals need to be able to see the specific automated verification rules software is performing. Today this is of particular importance as software may perform different sets of validation rules.
- **Comparison between multiple versions of a report in order to understand differences**. A necessary feature of a digital financial report creation or verification application is to manage last minute changes safely. The ability to perform automated comparisons between different versions of an SEC XBRL financial report to understand changes between the two versions of the same report is crucial. For example, if you did extensive work in verifying your SEC XBRL financial report and then there are a few last minute changes which need to be made, how can you be sure some other change was not unintentionally or maliciously introduced?
- **Managing workflow**. Creation of a financial report is a set of tasks which could involve a specific workflow. Managing the workflow of creating a financial report can be beneficial to users, but is not absolutely required from a software application.
- **Collaborative, multi-user.** Creation of a financial report is a collaboration. Verification is likewise a collaboration. Although not required by everyone; the ability to effectively collaborate with others during the verification process can be a desirable feature to some, a required feature for others.

16.15. Unanswered verification related questions

The following is a summary of unanswered questions which exist relating to verification of digital financial reports which will eventually need to be addressed but which have yet to be adequately addressed:

- **Should software be certified and if so, then how**: Having software work consistently and predictably across the many different software vendors implementing such software is crucial. Today it is extremely difficult to understand what a software application is doing and what it is not doing in terms of verification of an SEC XBRL financial filing. Further, different software applications work in different ways (i.e. there is no one standard way) and even worse, interoperability issue sometimes exist. Sometimes accountants feel XBRL is a like a "black box".
- **Software interoperability**: Having different software provide different results is less than optimal. For example, SEC EFM validation is different per the SEC, the XBRL Cloud EDGAR Dashboard, and other software vendors which obviously pass SEC EFM validation because their filings were accepted by the SEC; but XBRL Cloud reports what they believe is an error but clearly the people creating the filing do not agree is an error or they do agree that it is an error but they just missed that specific item.
- **SEC validation criteria**: Few people would dispute that the SEC is not specifying all that is needed to be specified for SEC XBRL financial filings. If they were, the software interoperability issues mentioned above would not exist. We are still in the early years of the SEC's use of XBRL, the SEC does not want to overwhelm filers in these early years; but they have sent messages that they would crack down eventually. Further, what is the scope of validation rules expected of the SEC? Is it appropriate or does the SEC have rules today that say "make sure your balance sheet balances"? Are rules of that level appropriate to be specified? What about other disclosure rules.
- **US GAAP taxonomy is incomplete**: The US GAAP taxonomy is obviously incomplete in the area of business rules and disclosure rules which exist in US GAAP. It should not be a guessing game to figure out information such as what XBRL US is publishing as their "consistency suite". It seems that this information should exist in the taxonomy. At the other end of the spectrum; what is necessary from the FASB is more like an ontology as opposed to a taxonomy. US GAAP is a far richer than what is being articulated in the current instantiation of the US GAAP taxonomy. Exactly how far should the US GAAP taxonomy go? Should a complete computer readable disclosure checklist be provided by the SEC or FASB? Or, should the market provide this useful resource? If different vendors in the market provide different rules, how will that impact interoperability?

17. Analysis and Comparison of Digital Financial Reports

The ultimate test as to whether a digital financial report is properly created is its utility in terms of being analyzed and/or compared. After all, prudence dictates that making use of XBRL-based financial information should not be a guessing game. Rather, using the information should be safe, reliable, predictable, and repeatable.

This section uses the example of XBRL-based public company financial reports in order to discuss the use and analysis of digital financial reports. This section places no judgments as to what *should* be comparable. That is up to the financial reporting supply chain. This section is about what is *necessary* for use and comparability to occur. Decisions as to *where* comparability should exist are questions which the reporting supply chain participants must answer.

Use of digital financial information should not be equated the techniques used to gather and use information today. Consider the following videos of one analysis software application which leverages XBRL as an example of the possibilities enabled by digital financial reporting:

http://www.sqlpower.ca/consulting/page/xbrl-analytics

17.1. Change in the analysis paradigm

Today, financial information is a general, pre-canned, static, one-size-fits-all, hard to use let alone reuse report where a reporting entity tells the reader what information is important. The story the financial report tells is from one perspective, the creator of the financial report.

Today, each financial analyst pulls out the facts which that analyst believes are the relevant facts, makes adjustments to the facts reported by the company, and defines their own unique perspective of how that company provides economic value.

Today, the financial information supply chain has inefficiencies which can be improved using automated machine-based processes to help perform analysis.

Digital financial reports make analysis easier. Digital financial reports changes the fundamental equation making a one-size-fits-all and single perspective unnecessary.

Eventually what digital financial reports offer will change what regulators and standards setters specify what a financial statement looks like and what a financial report contains.

The supply change will be reversed and users of the information will pull the relevant facts which they feel they need, rather than one perspective a broad set of hundreds if not thousands of different perspectives will be available. Analysts will compete at the level of their unique perspective as to the economic value provided by a company. Analysts and other consumers of digital financial information will assemble their own unique reports rather than rely on the pre-canned stories told by the companies themselves. Rather than having one view forced upon you, each consumer of information will find it easier to assimilate their own estimation/judgment as to the viability of a company and the economic value that company provides.

There are two different parts to analysis of information: (1) obtaining reported facts and (2) interpretation of reported facts. Machine-readable XBRL-based digital financial reports are about providing those facts using automated processes, rather than through rekeying information. That is the focus. The story told by the economic entity reporting the facts and the story understood by the analyst consuming the facts would be the same. A fact is a fact. How analysts interpret the facts is up to each individual analyst.

Digital financial reporting will make analysis more efficient, will make information easy to share, will, perhaps, arguably make financial analysis more effective. While all this has yet to be seen, the possibility seems to be within grasp if you understand how to look.

17.2. Repository of machine-readable facts

The purpose of this section is to set your perspective and expectations. Imagine a machine-readable repository of information. Imagine that you want to query that repository and get the value of two concepts for every economic entity in that repository: *Assets* and *Liabilities and Equity*. In order to extract that information from any XBRL-based financial report using a machine-based process the following process needs to be followed:

1. Software MUST locate each report you want to query. You want to be sure you have the correct report. For example, if a report is amended, you need the most current report.
2. The report MUST be valid XBRL technical syntax. If the technical syntax is invalid, you may or may not get the correct results.
3. Software MUST locate the appropriate reporting units (currency). In the case of public company financial reports, 99% of entities report using US Dollars. However, 1% use other currencies as the reporting units.
4. Software MUST appropriately identify the root reporting entity in the report, we don't want business segment information. Generally, this is the consolidated entity but it could be a parent holding company or some other accounting entity.
5. Software MUST appropriately locate the current balance sheet date. Generally you want information about the current balance sheet data and not the prior balance sheet, both are provided in the same report.
6. Software MUST find the appropriate US GAAP concept used to express *Assets* which is us-gaap:Assets.
7. Software MUST find appropriate US GAAP concept for *Liabilities and Equity*. This is a little harder because there are multiple possible concepts: us-gaap:LiabilitiesAndStockholdersEquity or us-gaap:LiabilitiesAndPartnersCapital.
8. Software MUST check the returned information to assure that it is consistent with what is expected, the business domain rule that "Assets = Liabilities and Equity".

That is an overview of the workflow/process to obtain a basic set of information from the repositiry of XBRL-based public company financial filings. And here are the

results of that query for every financial report from the SEC EDGAR system of XBRL-based public company financial reports:

xbrl:Entity	Legal Entity	Fiscal Period	Fiscal Year	Assets	Liabilities and Equity	Units	Difference in Value
All CIK numbers	Root economic entity	FY	2001	280	280	iso4217:USD	0
All CIK numbers	Root economic entity	FY	2009	31,586,555,000	31,586,555,000	iso4217:USD	0
All CIK numbers	Root economic entity	FY	2010	23,061,516,000	23,061,516,000	iso4217:CAD	0
All CIK numbers	Root economic entity	FY	2010	8,833,200,000	8,833,200,000	iso4217:GBP	0
All CIK numbers	Root economic entity	FY	2010	33,205,444,569,755	33,235,543,477,631	iso4217:USD	30,098,907,876
All CIK numbers	Root economic entity	FY	2011	45,216,467	45,216,467	iso4217:AUD	0
All CIK numbers	Root economic entity	FY	2011	110,885,000	110,885,000	iso4217:BRL	0
All CIK numbers	Root economic entity	FY	2011	28,708,716,218	28,708,716,218	iso4217:CAD	0
All CIK numbers	Root economic entity	FY	2011	1,226,733,000	1,226,733,000	iso4217:EUR	0
All CIK numbers	Root economic entity	FY	2011	7,938,800,000	7,938,800,000	iso4217:GBP	0
All CIK numbers	Root economic entity	FY	2011	1,565,000	1,565,000	iso4217:ILS	0
All CIK numbers	Root economic entity	FY	2011	46,395,324,314,234	46,165,763,878,111	iso4217:USD	(229,560,436,123)
All CIK numbers	Root economic entity	FY	2012	49,066,850	49,066,850	iso4217:AUD	0
All CIK numbers	Root economic entity	FY	2012	32,470,161,238	32,470,161,238	iso4217:CAD	0
All CIK numbers	Root economic entity	FY	2012	1,303,349,000	1,303,349,000	iso4217:EUR	0
All CIK numbers	Root economic entity	FY	2012	10,504,300,000	10,504,300,000	iso4217:GBP	0
All CIK numbers	Root economic entity	FY	2012	47,493,211,088,244	47,307,285,874,940	iso4217:USD	(185,925,213,304)
All CIK numbers	Root economic entity	FY	2013	54,642,443	54,642,443	iso4217:AUD	0
All CIK numbers	Root economic entity	FY	2013	39,919,462,935	39,919,385,738	iso4217:CAD	(77,197)
All CIK numbers	Root economic entity	FY	2013	13,120,000	13,120,000	iso4217:EUR	0
All CIK numbers	Root economic entity	FY	2013	48,909,115,040,682	48,735,740,980,605	iso4217:USD	(173,374,060,077)
All CIK numbers	Root economic entity	FY	2014	342,493,649,881	342,493,649,881	iso4217:USD	0
				176,531,415,952,227	175,972,655,073,402		(558,760,878,825)
							-0.3%

The results[185] show that most of the balance sheets balance, *Assets = Liabilities and Equity*. Some are inconsistent with what you would expect. The total inconsistency is .3% which is not too bad. However, the information needs to be 100% consistent in order to not get humans involved to figure out exactly what is causing the inconsistencies.

What needs to be considered when querying other facts from a repository works in exactly the same way as this basic query.

17.3. Comparing fundamental accounting concepts

Professional accountants understand that economic entities have many similarities in how they report information and they also have differences. As explained in the section *Understanding Fundamental Accounting Concepts and Report Frames*, some reporting entities provide a classified balance sheet and other reporting entities provide an unclassified balance sheet. It is impossible to compare at the level of current and noncurrent assets and liabilities if such a breakdown of information does not exist. However, a comparison can still be made at the level of assets and liabilities and equity as this high level is provided by both entities.

Every general purpose financial report is comparable to all other reports at a very high level. For example, every economic entity reports assets, liabilities, equity, revenues, net income (loss), net cash flow, and so forth.

Economic entities are directly comparable to other economic entities if each entity reports using the same style of reporting. For example, if current assets, current

[185] Query and results provided by SECXBRL.info which is a commercial software application, see http://app.secxbrl.info/

liabilities, gross profit, operating income (loss), and other such information is explicitly provided; then the information is directly comparable. Even if some information is not explicitly provided, such as total noncurrent assets or total noncurrent liabilities, financial information is still comparable many times information which is not explicitly provided can be imputed based on other explicitly provided information. For example, if assets is reported and current assets is reported; the value of noncurrent assets can be safely imputed because the relationship between assets, current assets, and noncurrent assets is well established to be assets = current assets + noncurrent assets.

And so for arguments sake, imagine that you had an economic entity which explicitly reported some specific set of facts and other facts could be imputed using well established and agreed upon relations of other financial facts as is shown below:

General information				
Entity Registrant Name	**ABC Company, Inc.**	Reported	OK	dei:EntityRegistrantName
CIK	0000000001	Reported	OK	dei:EntityCentralIndexKey
Entity Filer Category	Large Accelerated Filer	Reported	OK	dei:EntityFilerCategory
Trading symbol	abc	Reported	OK	dei:TradingSymbol
Fiscal Year End	--12-31	Reported	OK	dei:CurrentFiscalYearEndDate
Fiscal Year	2012	Reported	OK	dei:DocumentFiscalYearFocus
Fiscal Period	FY	Reported	OK	dei:DocumentFiscalPeriodFocus
Document Type	10-K	Reported	OK	dei:DocumentType
Balance Sheet Date	2012-12-31	Reported	OK	dei:DocumentPeriodEndDate
Income Statement Start Period (Year to Date)	2012-01-01	Imputed	OK	Determined by examination of filing
Balance Sheet	***Classified***			
Current Assets *(if classified balance sheet)*	56,000,000	Reported	OK	us-gaap:AssetsCurrent
Noncurrent Assets *(if classified balance sheet)*	91,000,000	Imputed	OK	Noncurrent assets not found; however assets and current assets reported.
Assets	147,000,000	Reported	OK	us-gaap:Assets
Current Liabilities *(if classified balance sheet)*	55,000,000	Reported	OK	us-gaap:LiabilitiesCurrent
Noncurrent Liabilities *(if classified balance sheet)*	52,000,000	Imputed	OK	Noncurrent liabilities not found; imputed based Liabilities - CurrentLiabilities
Liabilities	107,000,000	Imputed	OK	Liabilities not found; imputed based LiabilitiesAndEquity - (CommitmentsAndContingencies + TemporaryEquity + Equity)
Commitments and Contingencies	0	Reported		us-gaap:CommitmentsAndContingencies
Temporary Equity	0	Not found		
Equity Attributable to Parent	36,000,000	Reported	OK	us-gaap:StockholdersEquity
Equity Attributable to Noncontrolling Interest	4,000,000	Reported	OK	us-gaap:MinorityInterest
Equity	40,000,000	Reported	OK	us-gaap:StockholdersEquityIncludingPortionAttributableToNoncontrollingInterest
Liabilities and Equity	147,000,000	Reported	OK	us-gaap:LiabilitiesAndStockholdersEquity
Income Statement	***Multi-step***			
Revenues *(single-step alternative)*	10,000,000	Reported		us-gaap:Revenues
Costs of Revenues *(single-step alternative)*	4,000,000	Reported		us-gaap:CostOfRevenue
Operating Expenses *(single-step alternative)*	1,850,000	Reported		us-gaap:OperatingExpenses
Costs and Expenses *(single-step alternative)*	5,850,000	Imputed	OK	CostsAndExpenses = CostOfRevenue + OperatingExpenses
Other Operating Income (Loss) *(single-step alternative)*	0	Imputed		OtherOperatingIncome = OperatingIncomeLoss - (GrossProfit - OperatingExpenses)
Operating Income (Loss) (Single-*step alternative*)	4,150,000	Reported	OK	us-gaap:OperatingIncomeLoss
Revenues *(multi-step alternative)*	10,000,000	Reported	OK	us-gaap:Revenues
Costs of Revenue *(multi-step alternative)*	[illegible]	Reported	OK	us-gaap:CostOfRev[illegible]

And imagine that an analyst desired to compare that economic entity against several other economic entities which reported exactly the same facts explicitly or that each of the unreported facts could be safely and reliably imputed using well established relations between explicitly reported facts.

And so imagine that you had the following set of economic entities which some analyst desired to compare and all of the facts which were explicitly provided or safely and reliability imputed as is shown below:

B	C	D	E	F	G	H	I	J	K
Link to XBRL Instance:	Go to XBRL Instance	Go to XBRL Instance	Go to XBRL Instance	Go to XBRL Instance	Go to XBRL Instance	Go to XBRL Instance	Go to XBRL Instance	Go to XBRL Instance	Go to XBRL Instance
Link to XBRL Cloud Viewer:	Go to XBRL Cloud Viewer	Go to XBRL Cloud Viewer	Go to XBRL Cloud Viewer	Go to XBRL Cloud Viewer	Go to XBRL Cloud Viewer	Go to XBRL Cloud Viewer	Go to XBRL Cloud Viewer	Go to XBRL Cloud Viewer	Go to XBRL Cloud Viewer
General Information									
Entity Registrant Name	**Federal Home Loan Bank of Cincinnati**	**Federal Home Loan Bank of Dallas**	**Federal Home Loan Bank of Des Moines**	**Federal Home Loan Bank of Indianapolis**	**Federal Home Loan Bank of New York**	**Federal Home Loan Bank of Pittsburgh**	**FEDERAL HOME LOAN BANK OF SAN FRANCISCO**	**Federal Home Loan Bank of Seattle**	**Federal Home Loan Bank of Topeka**
CIK	0001326771	0001331757	0001325814	0001331754	0001329842	0001330399	0001316944	0001329701	0001325878
Entity Filer Category	Non-accelerated Filer	Non-accelerated Filer	Non-accelerated Filer	Non-accelerated Filer	Non-accelerated Filer	Non-accelerated Filer	Non-accelerated Filer	Non-accelerated Filer	Non-accelerated Filer
Trading symbol	Not provided	Not provided	Not provided	Not provided	Not provided	Not provided	Not provided	Not provided	Not provided
Fiscal Year End	--12-31	--12-31	--12-31	--12-31	--12-31	--12-31	--12-31	--12-31	--12-31
Fiscal Year	2011	2011	2011	2011	2011	2011	2011	2011	2011
Fiscal Period	FY	FY	Q4	FY	FY	FY	FY	Q4	FY
Document Type	10-K	10-K	10-K	10-K	10-K	10-K	10-K	10-K	10-K
Balance Sheet Date		2011-12-31	2011-12-31	2011-12-31	2011-12-31	2011-12-31	2011-12-31	2011-12-31	2011-12-31
Income Statement Start Period (Year to Date)		2011-01-01	2011-01-01	2011-01-01	2011-01-01	2011-01-01	2011-01-01	2011-01-01	2011-01-01
Balance Sheet	***Unclassified***	***Unclassified***	***Unclassified***	***Unclassified***	***Unclassified***	***Unclassified***	***Unclassified***	***Unclassified***	***Unclassified***
Assets	60,396,531,000	33,769,967,000	48,733,313,000	40,375,490,000	97,662,340,000	51,994,286,000	113,552,000,000	40,184,467,000	33,190,182,000
Liabilities	56,837,424,000	32,065,132,000	45,920,899,000	38,428,302,000	92,615,929,000	48,331,448,000	108,847,000,000	38,897,964,000	31,488,735,000
Commitments and Contingencies	0	0	0	0	0	0	0	0	0
Temporary Equity	0	0	0	0	0	0	0	0	0
Equity	3,559,107,000	1,704,835,000	2,812,414,000	1,947,188,000	5,046,411,000	3,662,838,000	4,705,000,000	1,286,503,000	1,701,447,000
Liabilities and Equity	60,396,531,000	33,769,967,000	48,733,313,000	40,375,490,000	97,662,340,000	51,994,286,000	113,552,000,000	40,184,467,000	33,190,182,000
Income Statement	***Single-step***	***Single-step***	***Single-step***	***Single-step***	***Single-step***	***Single-step***	***Single-step***	***Single-step***	***Single-step***
Revenues *(single-step alternative)*	1,010,743,000	322,948,000	902,515,000	703,209,000	886,494,000	776,377,000	1,786,000,000	370,054,000	546,487,000
Operating Income (Loss) (Single-*step alternative)*	174,831,000	57,645,000	97,613,000	134,799,000	302,623,000	46,478,000	258,000,000	93,380,000	97,759,000
Nonoperating Income (Loss)	0	0	0	0	0	0	0	0	0
Interest and Debt Expense	0	0	0	0	0	0	0	0	0
Nonoperating Income (Loss) + Interest and Debt Expense	0	0	0	0	0	0	0	0	0
Income (Loss) from Equity Method Investments	0	0	0	0	0	0	0	0	0
Income (Loss) from Continuing Operations Before Tax	174,831,000	57,645,000	97,613,000	134,799,000	302,623,000	46,478,000	258,000,000	93,380,000	97,759,000
Income Tax Expense (Benefit)	0	0	0	0	0	0	0	0	0
Income (Loss) from Continuing Operations After Tax	138,273,000	47,830,000	77,814,000	110,067,000	244,486,000	38,049,000	216,000,000	84,042,000	77,326,000
Income (Loss) from Discontinued Operations, Net of Tax	0	0	0	0	0	0	0	0	0
Extraordinary Items, Gain (Loss), Net of Tax	0	0	0	0	0	0	0	0	0
Net Income (Loss)	138,273,000	47,830,000	77,814,000	110,067,000	244,486,000	38,049,000	216,000,000	84,042,000	77,326,000
Net Income (Loss) Attributable to Parent	138,273,000	47,830,000	77,814,000	110,067,000	244,486,000	38,049,000	216,000,000	84,042,000	77,326,000
Net Income (Loss) Attributable to Noncontrolling Interest	0	0	0	0	0	0	0	0	0
Preferred Stock Dividends and Other Adjustments	0	0	0	0	0	0	0	0	0
Net Income (Loss) Available to Common Stockholders, Basic	138,273,000	47,830,000	77,814,000	110,067,000	244,486,000	38,049,000	216,000,000	84,042,000	77,326,000
Statement of Comprehensive Income									
Net Income (Loss)	138,273,000	47,830,000	77,814,000	110,067,000	244,486,000	38,049,000	216,000,000	84,042,000	77,326,000
Other Comprehensive Income (Loss)	-3,278,000	17,087,000	44,030,000	-23,295,000	0	0	1,050,000,000	56,294,000	-5,169,000
Comprehensive Income (Loss)	134,995,000	64,917,000	121,844,000	86,772,000	244,486,000	38,049,000	1,266,000,000	140,336,000	72,157,000

Now, imagine that you sent five different software applications to gather that information from the repository of information which you are using[186]. Would you expect the results obtained by each of the five different software applications to be identical?

Of course you would expect the results to be identical. If the results were not identical, that would mean that different software vendors used different information extraction algorithms to extract information from a repository of financial reports. And of course, one would expect different software working against the exact same digital financial reports would yield exactly the same query results.

Prudence dictates that using financial information from a digital financial report not be a guessing game. It is only through conscious effort that the specific control mechanisms can be put in place to realize this intent.

The goal is a system that works safely, reliably, predictably, repeatedly, effectively, and efficiently.

How is that achieved?

17.4. Description and verification are two sides of the same coin

Description of the information within some repository of machine-readable financial information and verification of the consistency of a financial report are two sides of the same coin. In order to make use of reported financial information safely, reliably, and predictably; the information cannot be correct 95%, or 98%, or 99% of the time. The information must be consistent with expectations 100% of the time for automated reuse of information to work. Whenever information is not consistent with expectations, then a human needs to get involved in order to determine the nature of the inconsistency.

[186] I did exactly this comparison, see this blog post, http://xbrl.squarespace.com/journal/2014/9/3/business-professionals-what-does-sec-xbrl-financial-filings.html

When you consider that a digital financial report contains hundreds or perhaps even thousands of reported facts and those facts have relations to other facts; the only way digital financial reporting could work is for machines to also help verify the consistency of financial reports against the description of what is expected.

As of this writing, XBRL-based financial reports submitted by public companies to the SEC were 63.2% consistent with expectations related to a set of 51 fundamental accounting concepts and 22 relations between those concepts[187]. Consistency with these basic relations has been improving month after month and eventually all inconsistencies will be resolved. Ultimately, not only 51 facts and 22 relations will be tested for quality but rather tens of thousands of facts and relations between facts will be used to make using financial information reported digitally work safely.

17.5. Financial reporting analysis use cases

These are the general use cases for making use of information reported in XBRL-based public company financial reports provided to the SEC or elsewhere:

- **Analysis of a single report**. Analysis of one financial report from one reporting entity.
- **Time series analysis for a reporting entity**. Two or more financial reports from the same reporting entity.
- **Comparative analysis across reporting entities**. Two or more financial reports from different reporting entities using different subsets of information.
- **Ratio analysis**. An analysis of a single report, a time series analysis, or a comparative analysis using ratios.

17.6. Two approaches to comparing information

In order for a machine such as a computer to compare information, the information must be identifiable by the machine. A machine must be able to identify and then address what information the business user desires to work with. There are two general approaches to addressing information and thus enabling a comparison:

- **Top down or explicit identity/address**. Using a top down approach some explicitly known identity is used to identify some reported fact or a set of facts which someone desires to compare. For example, the name of the fact such as us-gaap:Assets, or the name of some table such as us-gaap:BalanceSheet, or the name of a disclosure such as us-gaap:LongTermDebtMaturitiesTextBlock could be used as the way to identify what is being compared.
- **Bottom up or implicitly derive identity/address**. Using a bottom up approach, the characteristics or concepts contained within the set of a component are used to identify the item one desires to compare. Another term for this approach is prototype theory which we will explain in a moment.

Basically, the easy way identify something is to explicitly give that thing a name and then use that name to identify and then go grab that thing. But if that identifier is

[187] Public Company XBRL-based Digital Financial Report Quality Continues to Improve, http://xbrl.squarespace.com/journal/2015/5/17/public-company-xbrl-based-digital-financial-report-quality-c.html

no provided, then one needs to resort to other means of identifying the things you might wish to compare.

17.7. Top down or explicit identity/address comparison

Suppose that you wanted to compare some specific disclosure of two or more public companies that report to the SEC. How would you do that? Say perhaps that you wanted to compare the agricultural policy of each entity[188]. Below you can see this comparison for 5 such reporting entities:

Reporting entity #1:

China Ginseng Holdings Inc | 2013 | FY | ★★★★★

Ginseng Crops

The Company uses the full absorption costing method to value its Ginseng crops. Included in crop costs are seeds, labor, applicable overhead including depreciation, and supplies. Common costs are allocated in each period based upon the total number of hectors under cultivation during the period.

The carrying value of the Ginseng crops is reviewed on a regular basis for any impairment in value using management's best estimate as to expected future market values, yields and costs to harvest. Costs accumulated on the acres expected to be harvested during the next fiscal year have been classified as a current asset.

us-gaap:AgriculturePolicyPolicyTextBlock

Reporting entity #2:

FRESH DEL MONTE PRODUCE INC | 2013 | FY | ★★★★★

Growing Crops

Expenditures on pineapple, melon and non-tropical fruit growing crops are valued at the lower of cost or market and are deferred and charged to cost of products sold when the related crop is harvested and sold. The deferred growing costs included in inventories in our Consolidated Balance Sheets consist primarily of land preparation, cultivation, irrigation and fertilization costs. Expenditures related to banana crops are expensed in the year incurred due to the continuous nature of the crop.

us-gaap:AgriculturePolicyPolicyTextBlock

Reporting entity #3:

HOMEFED CORP | 2013 | FY | ★★★★★

Farming Revenues and Expenses – Income from farming related activities at the Rampage property are recognized when grapes are sold, and expenses from farming related activities are recognized when incurred.

us-gaap:AgriculturePolicyPolicyTextBlock

[188] You can run this comparison for yourself here, http://www.xbrlsite.com/LinkedData/Exemplars/Exemplars3.aspx?DisclosureObjectName=AgriculturePolicies

Reporting entity #4:

S&W Seed Co | 2013 | FY | ★★★★★

Crop Production Costs

Expenditures on crop production costs are valued at the lower of cost or market and are deferred and charged to cost of products sold when the related crop is harvested and sold. The deferred crop production costs included in the consolidated balance sheets consist primarily of the cost of plants and the transplanting, stand establishment costs, intermediate life irrigation equipment and land amendments and preparation. Crop production costs are estimated to have useful lives of three to five years depending on the crop and nature of the expenditure and are amortized to growing crop inventory each year over the estimated life of the crop.

Components of crop production costs are:

	June 30, 2013	June 30, 2012
Stevia	$ -	$ 935,466
Alfalfa seed production	1,497,605	73,031
Alfalfa hay	84,904	46,067
Wheat and triticale	-	43,728
Total crop production costs, net	$ 1,582,599	$ 1,098,292

us-gaap:AgriculturePolicyPolicyTextBlock

Reporting entity #5:

TEJON RANCH CO | 2013 | FY | ★★★★★

Vineyards and Orchards

Costs of planting and developing vineyards and orchards are capitalized until the crops become commercially productive. Interest costs and depreciation of irrigation systems and trellis installations during the development stage are also capitalized. Revenues from crops earned during the development stage are netted against development costs. Depreciation commences when the crops become commercially productive.

At the time farm crops are harvested, contracted, and delivered to buyers and revenues can be estimated, revenues are recognized and any related inventoried costs are expensed, which traditionally occurs during the third and fourth quarters of each year. It is not unusual for portions of our almond or pistachio crop to be sold in the year following the harvest. Orchard (almond and pistachio) revenues are based upon the contract settlement price or estimated selling price, whereas vineyard revenues are typically recognized at the contracted selling price. Estimated prices for orchard crops are based upon the quoted estimate of what the final market price will be by marketers and handlers of the orchard crops. These market price estimates are updated through the crop payment cycle as new information is received as to the final settlement price for the crop sold. These estimates are adjusted to actual upon receipt of final payment for the crop. This method of recognizing revenues on the sale of orchard crops is a standard practice within the agribusiness community. Adjustments for differences between original estimates and actual revenues received are recorded during the period in which such amounts become known.

us-gaap:AgriculturePolicyPolicyTextBlock

Notice that each reporting entity used the US GAAP XBRL Taxonomy concept *us-gaap:AgriculturePolicyPolicyTextBlock* to report this information. That concept is directly identifiable using the name of the concept.

Now, suppose you wanted to compare the document and entity information reported by each reporting entity. How would you identify that part of a financial report?

Every reporting entity is required to report a specific set of document and entity information, so it exists in every financial report. We will look at only two reporting entities and that will provide all that we need in order to explain our point[189].

[189] You can run this query for yourself at this URL which provides many different reporting entities, http://www.xbrlsite.com/LinkedData/Exemplars/Exemplars3.aspx?DisclosureObjectName=DocumentAndEntityInformation

Reporting entity #1:

Component: (Network and Table)	
Network	00090 - Document - Document And Entity Information (http://www.3dsystems.com/role/DocumentDocumentAndEntityInformation)
Table	(Implied)

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0000910638 (http://www.sec.gov/CIK)

Document And Entity Information [Abstract]	Period [Axis]	
	2012-01-01 - 2012-12-31	2013-02-15
Document And Entity Information [Abstract]		
Document Type	10-K	
Amendment Flag	false	
Document Period End Date	2012-12-31	
Document Fiscal Year Focus	2012	
Document Fiscal Period Focus	FY	
Entity Registrant Name	3D SYSTEMS CORP	
Entity Central Index Key	0000910638	
Current Fiscal Year End Date	--12-31	
Entity Filer Category	Large Accelerated Filer	
Entity Public Float		
Entity Common Stock, Shares Outstanding		61,382,789
Entity Current Reporting Status	Yes	
Entity Voluntary Filers	No	
Entity Well-known Seasoned Issuer	Yes	

Reporting entity #2:

Component: (Network and Table)	
Network	00090 - Document - Document And Entity Information (http://www.accellent.com/2010-09-30/role/DocumentDocumentAndEntityInformation)
Table	(Implied)

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0001342505 (http://www.sec.gov/CIK)

Document And Entity Information [Abstract]	Period [Axis]	
	2011-01-01 - 2011-12-31	2012-03-28
Document And Entity Information [Abstract]		
Document Type	10-K	
Amendment Flag	false	
Document Period End Date	2011-12-31	
Entity Central Index Key	0001342505	
Document Fiscal Year Focus	2011	
Document Fiscal Period Focus	FY	
Entity Registrant Name	ACCELLENT INC	
Current Fiscal Year End Date	--12-31	
Entity Filer Category	Non-accelerated Filer	
Entity Common Stock, Shares Outstanding		1,000
Entity Current Reporting Status	Yes	
Entity Voluntary Filers	No	
Entity Well-known Seasoned Issuer	No	
Entity Public Float		

How would you identify the pieces above as representing what we are referring to as the document and entity information report fragment of the public company financial report? Notice the information used to identify the network circled for each reporting entity. By chance, the network label is exactly the same for these two reporting

entities. However, that cannot be used to identify the report fragment because that label is not required and many other reporting entities do not use that label. The network identifier is different for each reporting entity. So, how would you address the report fragment in order to grab that specific report fragment, the document and entity information, which is required to be reported by every reporting entity?

There are no unique handles at the report fragment or report component level.

Basically, XBRL-based public company financial reports cannot be compared top down because every network is unique for each reporting entity, [Table]s are not required and can be used to identify different report components and are not guaranteed to be unique, and there are no other such "handles" which can be used to grab the pieces one desires to compare.

And so, a top down approach is not possible when trying to compare XBRL-based public company financial reports. Therefore, a bottom up approach needs to be employed.

17.8. Bottom up or implicitly derive identity/address: fundamentals of Prototype Theory

There are two perspectives which can be used to understanding what something is[190]:

- Aristotle's definition view perspective was that "A thing is a member of a category if it satisfies the definition of the thing." This is the top down approach.
- The second perspective, prototype theory, is that we can know what something means even if it can't be clearly defined and even if its boundaries cannot be sharply drawn; concepts can be clear without having clear definitions if they're *organized around undisputed examples*, or prototypes, as Eleanor Rosch the inventor of prototype theory calls them.

As an example, one can understand that something is a "chair" by understanding as many properties as possible about the thing you are looking at, looking at the properties of a chair as defined by a prototype (the undisputed example), and then predicting whether the thing you are looking at is a "chair" by comparing the properties you are looking at with the properties of what is known to be a chair.

By contrast, the definitional view "draws sharp lines" whereas the prototype view works because "things can be sort of, kind of, in a category. Prototype theory relies on our implicit understanding and does not assume that we can even make that understanding explicitly.

17.8.1. Issues identifying components within XBRL-based public company financial reports

As we pointed out, XBRL-based public company financial reports provide no top level foundation for comparability, no "handles" as they are sometimes referred to. Two possible candidates for these handles which could serve as a basis for comparison are networks and [Table]s.

[190] This information is inspired by the book *Everything is Miscellaneous*: the power of the new digital disorder, by David Weinberger, chapter 9, pages 173 to 198. That chapter has detailed explanations and reasoning which supports prototype theory.

If you examine the networks of each XBRL-based public company financial report submitted to the SEC you quickly realize that each defines its own networks and no two networks in XBRL-based public company financial reports are the same. This is per SEC XBRL filing rules. A reporting entity does use the same network, in fact reporting entities are required by EFM rules to use the same network identifier, to identify the same component across all their financial reports. But this does no help someone trying to compare two reports of different reporting entities to identify the same thing, such as the document and entity information report fragment, in order to compare them.

That rules out networks as a candidate for providing a basis of comparison.

Another candidate is the [Table]. However the [Table] is ruled out because [Table]s are not guaranteed unique. For example the "Statement [Table]" is used on the balance sheet, income statement, statement of cash flows, and a number of other statements and often also used in disclosures. Other [Table]s are used multiple times within the US GAAP taxonomy and define different sets of information. Finally, [Table]s are not required for every report fragment or component.

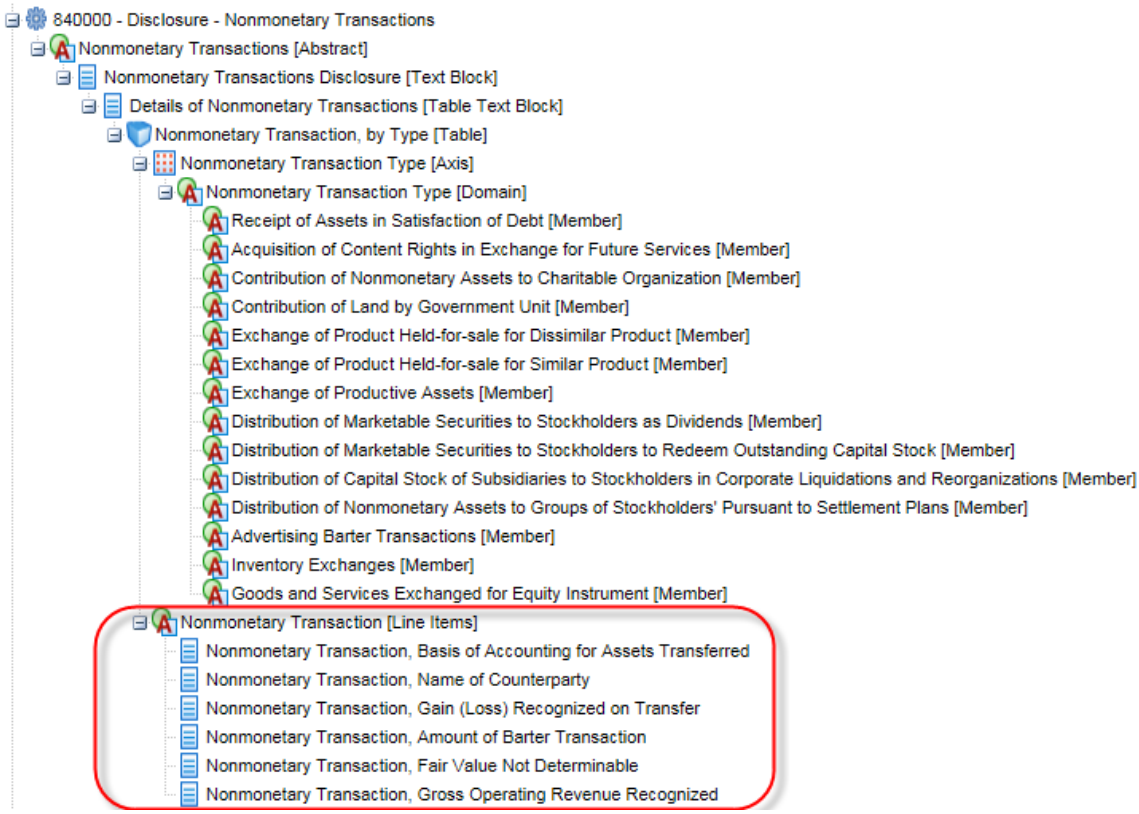
17.8.2. Other issues

Looking at this situation from the bottom up, there are approximately 15,000 concepts within the US GAAP XBRL Taxonomy, too detailed a perspective for any useful comparison at the individual concept level. There is no middle "level" between the 15,000 concepts which is too granular and too large and the Networks or [Table]s which are too few, most time not identifiable as [Table]s are many times implicit and have no explicit handle to grab onto.

17.8.3. Looking deeper in to XBRL-based public company financial reports

If you look deeper into financial filings you realize some things which are quite useful in grabbing handles to allow for meaningful comparisons of information. For example, consider this small fragment of the US GAAP XBRL Taxonomy which is used to disclose nonmonetary transactions. This is the network 840000 – Disclosure – Nonmonetary Transactions[191]:

[191] You can view this in the US GAAP XBRL Taxonomy here, http://xbrlview.fasb.org/yeti/resources/yeti-gwt/Yeti.jsp#tax~(id~156*v~3912)!net~(a~3063*l~749)!lang~(code~en-us)!rg~(rg~32*p~12)



Look at the fragment of the US GAAP XBRL Taxonomy above which is used to represent the disclosure of nonmonetary transactions and consider the following:

- A reporting must report their nonmonetary transaction disclosure information at two levels: block tagged or detailed tagged. If the information is block tagged, the concept *Details of Nonmonetary Transactions [Table Text Block]* would be used. If the information were detailed tagged a filer would use some combination of concepts within the set of *Nonmonetary Transaction [Line Items]*. Per SEC filing rules, both of these should exist in a financial report as the Level 3 Text Block and the Level 4 Detailed disclosure. The Level 1 Text Block may or may not exist, depending upon where the reporting entity puts this disclosure.
- The concepts within the *Nonmonetary Transaction [Line Items]* are used nowhere else in the US GAAP Taxonomy. As such, if one sees one or more of these concepts on a fact within an XBRL-based report; then one can assume with a high level of confidence that the component which contains one or more of those concepts is highly likely to be the nonmonetary transactions disclosure. As such, you really don't need the *Nonmonetary Transactions [Table]* explicitly identified. However, if that [Table] did exist, it is highly probable that it would be used with the nonmonetary transactions disclosure.
- The [Axis] *Nonmonetary Transaction Type [Axis]* is used in only one place and for one thing in the US GAAP XBRL Taxonomy. As such, that too could be used to identify the disclosure of nonmonetary transactions. Combining both the [Axis] and the concepts increases probability even more.

- Financial reporting rules and logic demand that certain concepts always be present. For example, this component would make little sense without the concept *Nonmonetary Transaction, Amount of Barter Transaction*. In financial reporting rules certain information is always required to be disclosed, certain information is required to be disclosed if a certain event or circumstance occurs during a financial period, certain information is common practice, and certain information is reported at the option of the reporting entity. Some base set of information will always exist, it will always be logical based on financial reporting disclosure requirements and logic.
- If additional required disclosures which expand the base disclosure is presented, if common practice disclosures are provided, or additional optional information is disclosed; it will always exist with that base, supplementing that base disclosure which would always include the concept *Nonmonetary Transaction, Amount of Barter Transaction* or perhaps *Nonmonetary Transaction, Fair Value Not Determinable*.

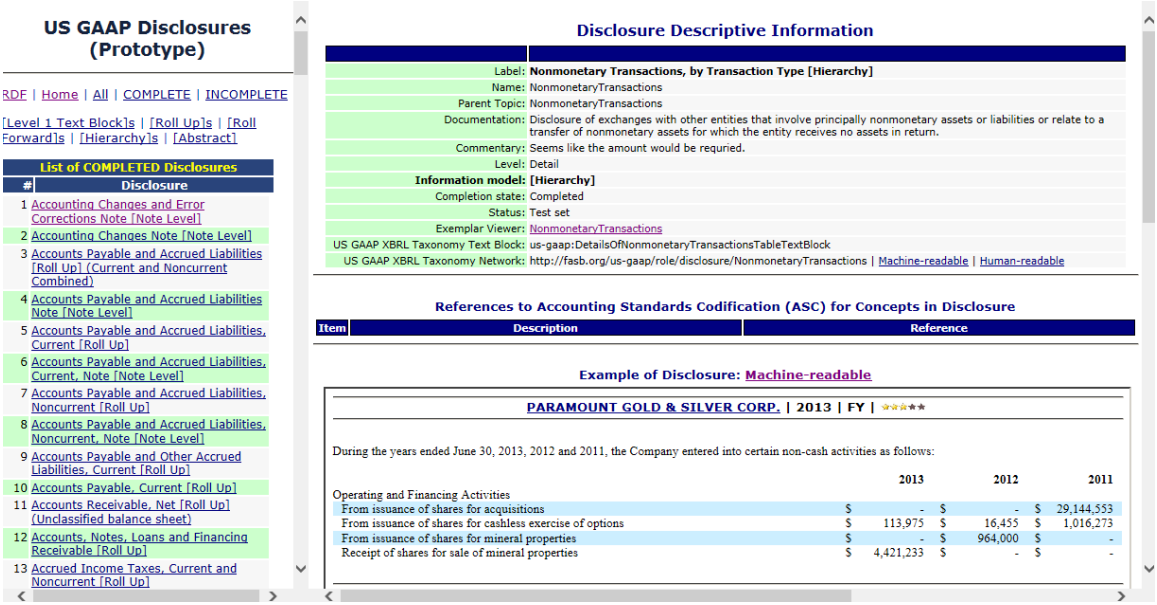
The point of all this is to say that the pieces of a disclosure provide a highly reliable mechanism for discovering the component you are looking for, whatever someone may have called that component network label or identifier. The only thing which is necessary to use this approach is a prototype of what you call the component you desire to work with and a unique name which is used to identify that piece which serves as the addressable handle[192].

17.8.4. Prototypes for creation and analysis are the same

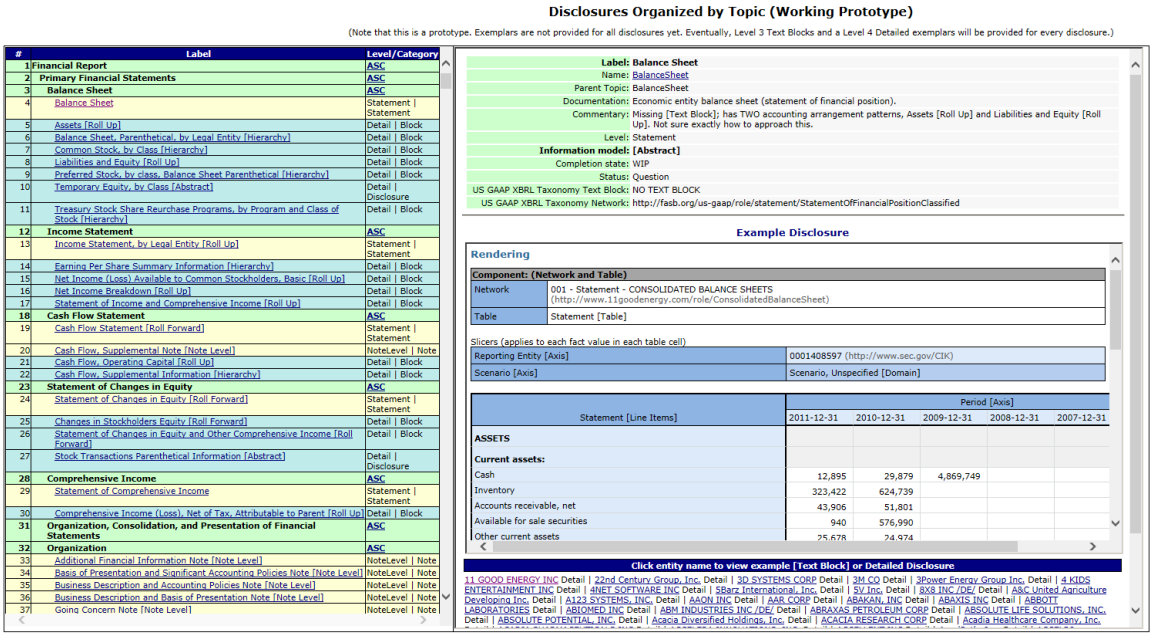
These prototypes are useful for not only analysis but also for creation of XBRL-based financial reports. The prototypes serve as examples or templates or stencils; whatever term you might like to call them. These prototypes can be hard to see within the US GAAP XBRL Taxonomy because that taxonomy tends to be inconsistent, not uniform, and the appropriate component layer is not clearly identified. However, by reorganizing the US GAAP XBRL Taxonomy into smaller pieces, it is much easier to see the components and the prototypes[193].

[192] Here is the human-readable prototype, http://www.xbrlsite.com/2015/fro/us-gaap/html/Disclosures/Detail/Disclosure-421.html; and here is the machine readable prototype, http://www.xbrlsite.com/2015/fro/us-gaap/xml/Disclosures/Prototypes/Prototype-421.xml

[193] Disclosures, http://www.xbrlsite.com/2015/fro/us-gaap/html/Disclosures/Detail/index.html



While a flat, alphabetized list may be useful for some things, what is more interesting is that you can reorganize the components any way you choose rather than being locked into one view. For example, consider this view where disclosures are organized into topic[194].



Approximately 1000 disclosures were identified within the US GAAP XBRL Taxonomy. Each disclosure has a prototype which is used to identify and serve as a machine-readable signature for the disclosure.

194 Disclosures organized by topic, http://www.xbrlsite.com/LinkedData/Exemplars/Topics.aspx

17.8.5. Exemplar theory and prototype theory

Prototype theory[195] is one way of identifying something by its components. Another approach is exemplar theory[196]. With prototype theory you generally have only one prototype. With exemplar theory you can have multiple prototypes for the same thing[197].

It is not the case that there is only one "undisputed example", nor does their need to be. For example, there are many different types of balance sheets: classified, unclassified, deposit based operations, insurance based operations, securities based operations, and others for specific industries and financial reporting needs. However, it is not the case that there are an infinite number of balance sheets. Financial information is not random or infinite in nature.

Specific undisputed examples can be created and even cross referenced with additional information. Another way of saying this is that there is no need to have only one undisputed example for any piece of a financial report. Further, this idea applies to each piece of a financial report and to the full set of pieces which an XBRL-based public company financial reports.

17.8.6. Public company XBRL-based financial reports are the ultimate exemplars

Public company XBRL-based financial reports are the ultimate exemplars. The screen shot below shows a partial comparison of the Level 3 Text block and Level 4 Detailed disclosure for the components of property, plant, and equipment across public company XBRL-based financial reports[198]:

CIK	EntityRegistrantName	AccessionNumber	Text Block	Detailed level roll up
0001077800	AccelPath, Inc.	0001376474-12-000350	us-gaap:PropertyPlantAndEquipmentTextBlock	us-gaap:PropertyPlantAndEquipmentNet
0000796343	ADOBE SYSTEMS INC	0000796343-13-000008	us-gaap:PropertyPlantAndEquipmentTextBlock	us-gaap:PropertyPlantAndEquipmentNet
0000098618	ALANCO TECHNOLOGIES INC	0000098618-12-000037	us-gaap:PropertyPlantAndEquipmentTextBlock	us-gaap:PropertyPlantAndEquipmentNet
0001101215	ALLIANCE DATA SYSTEMS CORP	0001101215-13-000051	us-gaap:PropertyPlantAndEquipmentTextBlock	us-gaap:PropertyPlantAndEquipmentNet
0001374535	Altra Holdings, Inc.	0001193125-13-074398	us-gaap:PropertyPlantAndEquipmentTextBlock	us-gaap:PropertyPlantAndEquipmentNet
0000897448	AMARIN CORP PLC\UK	0001193125-13-084191	us-gaap:PropertyPlantAndEquipmentTextBlock	us-gaap:PropertyPlantAndEquipmentNet
0001444310	AMBICOM HOLDINGS, INC	0001144204-12-062292	us-gaap:PropertyPlantAndEquipmentTextBlock	us-gaap:PropertyPlantAndEquipmentNet
0000928465	AMCON DISTRIBUTING CO	0001047469-12-010255	us-gaap:PropertyPlantAndEquipmentTextBlock	us-gaap:PropertyPlantAndEquipmentNet
0000880807	AMERICAN SUPERCONDUCTOR CORP /DE/	0001193125-12-261967	us-gaap:PropertyPlantAndEquipmentTextBlock	us-gaap:PropertyPlantAndEquipmentNet
0000006314	ANAREN INC	0001437749-12-008058	anen:ScheduleOfPropertyPlantAndEquipmentTableTextBlock	us-gaap:PropertyPlantAndEquipmentNet
0001081078	API Technologies Corp.	0001193125-13-051966	us-gaap:PropertyPlantAndEquipmentTextBlock	us-gaap:PropertyPlantAndEquipmentNet

The above comparison was created manually in order to discover the prototype. Once the prototype is created, then the prototype can be used in order to discover other disclosures which follow this same pattern.

This process can be useful for two purposes. First, it helps discover the prototype and exemplars of good disclosures. Second, it points out either inconsistencies if XBRL-based financial reports or important subtleties and nuances which could really be other different disclosures. Observing disclosures and discussions by accounting professionals will yield the answer to the question of which it is: an inconsistency or a subtlety/nuance.

The screen shot below shows an organization of the disclosures, prototypes, and exemplars in human-readable form. But realize that the same information is

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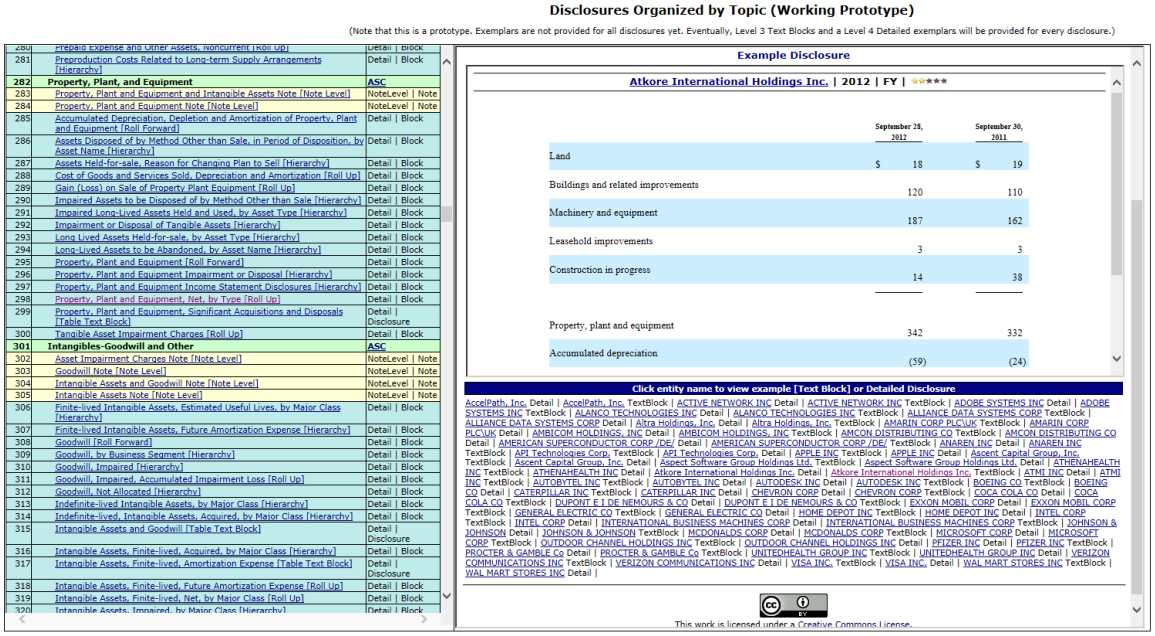
195 Prototype theory, http://en.wikipedia.org/wiki/Prototype_theory

196 Exemplar theories of concept learning, http://en.wikipedia.org/wiki/Concept_learning#Exemplar_theories_of_concept_learning

197 Prototype and Exemplar Theories of Concepts, http://courses.umass.edu/psy315/prototype.html

198 See the analysis of the disclosure PropertyPlantAndEquipmentNetByTypeRollUp, http://www.xbrlsite.com/2014/Reference/PropertyPlantAndEquipmentNetByTypeRollUp.pdf

available in machine-readable form. This machine-readable information servers as metadata to both describe and verify consistency against disclosures.



17.9. Commercially available analysis products

There are many different commercial software applications which make use of XBRL-based financial information reported by public companies to the SEC and available from the EDGAR system. These software applications take different approaches and different things can be learned from different applications.

Few of these applications leverage all that there is to leverage from the structured nature of the information. In no particular order, below are three software tools which are worth exploring in detail.

17.9.1. 28msec SECXBRL.info

As mentioned earlier, 28msec[199] provides a free repository of public company financial information reported by public companies to the SEC via its SECXBRL.info repository[200]. Financial information is available for the DOW 30 companies with no signup at all. You can sign up for free and get access to all reported information. An API is provided. For those willing to roll up their sleeves and get their hands a little dirty, there is a lot that can be learned about where digital financial reporting and more generally digital business reporting is going.

17.9.2. XBRL Cloud

XBRL Cloud mainly focuses on validation services for public companies that provide XBRL-based financial reports to the SEC[201]. However, XBRL Cloud offers an API also.

199 28msec, http://www.28.io/

200 SECXBRL.info, http://app.secxbrl.info/

201 XBRL Cloud EDGAR Dashboard, https://edgardashboard.xbrlcloud.com/edgar-dashboard/

That API, the EDGAR Report Information Web Service[202], is unfortunately not publically available. But, the API is rather inexpensive. If you are serious about learning about digital financial reporting, paying for the API is worth the price.

XBRL Cloud provides some of the best renderings of XBRL-based information.

17.9.3. FinDynamics XBRL Analyst

XBRL Analyst is described as "XBRLAnalyst delivers real-time financial data to Excel" by its creator FinDynamics[203]. XBRLAnalyst is an Excel plugin. A free trial is available which allows you to explore the software before you purchase it. An API is also available.

[202] XBRL Cloud Edgar Report Information Web Service, https://www.xbrlcloud.com/home/edgar-report-information/eridev.html
[203] FinDynamics, https://findynamics.com/

18. Special or Specific Modelling Considerations

This section summarizes special and specific considerations when modelling an SEC XBRL financial filing. The key piece of information this section provides are subtleties which are often overlooked when working with specific types of structures of a financial report.

18.1. Notion of [Line Items] key concepts

Within a [Table]'s set of [Line Items], certain concepts are required or the set of [Line Items]s provided will simply make no sense. For example consider the following disclosure of nonmonetary transactions:

22	**Nonmonetary Transaction [Line Items]**	[Line Items]		
23	Details of Nonmonetary Transactions [Table Text Block]	[Concept] Text Block (HTML)	For Period	
24	Nonmonetary Transaction [Hierarchy]	[Abstract]		
25	Nonmonetary Transaction, Basis of Accounting for Assets Transferred	[Concept] Text/String	For Period	
26	Nonmonetary Transaction, Name of Counterparty	[Concept] Text/String	For Period	
27	Nonmonetary Transaction, Gain (Loss) Recognized on Transfer	[Concept] Monetary	For Period	Credit
28	Nonmonetary Transaction, Amount of Barter Transaction	[Concept] Monetary	For Period	Credit
29	Nonmonetary Transaction, Fair Value Not Determinable	[Concept] Text/String	For Period	
30	Nonmonetary Transaction, Gross Operating Revenue Recognized	[Concept] Monetary	For Period	Credit

The concept on line 28, the amount of the transaction, is clearly required as that is what is being disclosed. All other information provides additional descriptive information about that amount. This descriptive information may, or may not, be required to be disclosed depending on the financial reporting rules. Filers can add additional descriptive information. But in all cases the amount will exist because the fundamental information being communicated makes no sense without it.

These "required concepts" are not clearly indicated within the US GAAP taxonomy, however they are VERY clearly documented within US GAAP. A financial reporting disclosure checklist is used by accountants to make sure they don't leave anything out. Many of these relations (if you have this, then you have to disclose this; if you disclose this then you likewise need to disclose this) used within a financial reporting disclosure checklist can be checked using software.

18.2. Deciding between isomorphic and polymorphic tables

There are three different ways [Table]s can be articulated in a taxonomy:

- Unique tables (i.e. all tables isomorphic or each table has a unique meaning)
- Only one table for everything (i.e. every [Table] has the same name)
- Mixture (i.e. some tables are unique, some are used to mean the same thing, for example how "Statement [Table]" is used in the US GAAP Taxonomy; polymorphic tables)

Isomorphic tables have some advantages, polymorphic tables have no advantage what-so-ever. For more information, see this analysis:

http://www.xbrlsite.com/Examples/Dimensions/

18.3. Modeling classes with only one member

This example focuses on one specific point. As you can see in the screenshot below of information about classes of preferred stock and common stock; the common stock has two classes whereas the preferred stock has only one:

Classes of Preferred Stock

Class	Par Value	Share Subscriptions	Shares Authorized	Shares Issued	Shares Outstanding	Amount 2010	Amount 2009
company:ClassAPreferredStockMember	1	20000	20000	20000	6000	2,000	1,000
				Total all Classes	6000	2,000	1,000

Classes of Common Stock

Class	Par Value	Share Subscriptions	Shares Authorized	Shares Issued	Shares Outstanding	Amount 2010	Amount 2009
company:ClassACommonStockMember	1	10000	10000	10000	3000	500	500
company:ClassBCommonStockMember	1	10000	10000	10000	3000	500	500
				Total all Classes	6000	1,000	1,000

How would or should having only one [Member] in a breakdown impact the modelling of information? The question should not really be about whether one specific company has one class of two or more classes of something; but rather modelling should be driven by the possibility of ever having either only one or one-to-many [Member]s of some class of information.

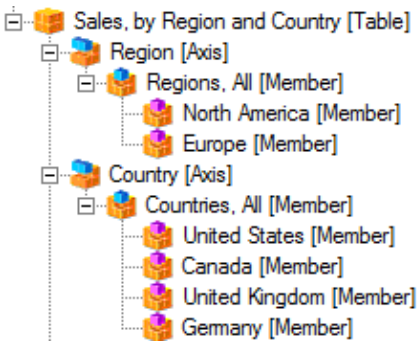
The point here is that an entity could have more than one class of preferred stock and a class of preferred stock can have a number of properties. Both the details of the class and the total of all classes, in the case shown above the total and the class are the same because there is only one member within the class; however, the total and the amount for each class are two different pieces of information.

18.4. Modeling as nested domain members

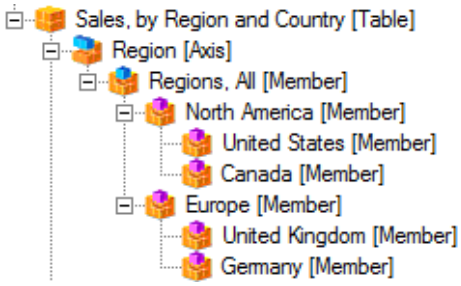
Consider the example below which breaks down revenues by region and country:

	2010	2009
NORTH AMERICA:		
United States	4,000	4,000
Canada	2,000	2,000
Total North America	6,000	6,000
EUROPE:		
United Kingdom	2,000	2,000
Germany	2,000	2,000
Total Europe	4,000	4,000
Total	10,000	10,000

There are two obvious options which might come to mind for modelling this information. The first option is to model a Region [Axis] and a Country [Axis]. That approach might look something like this:



Alternatively, one Region [Axis] with members for both the region and the country might be modelled. This approach might look as follows:



The question is, which is the more appropriate approach, one [Axis] with nested members or two [Axis]?

Today, the best approach would be to avoid nested hierarchies of [Member]s as XBRL is silent on articulating how to aggregate such nested hierarchies of [Member]s.

If you find yourself repeating information within members your modelling is more than likely incorrect. For example, modelling "North America, United States" and then "North America, Canada" packs two meanings into one [Member] which should generally be avoided.

18.5. Choosing between modeling as concepts or member of axis

At times a choice needs to be made as to whether information should be modelled by modelling information as a concept and part of the set of [Line Items] or as a [Member] or an [Axis]. The *Roll Up*, *Class* and *Class Properties* business use cases help understand the dynamics at play and how they will impact your model.

In those business use cases the choices may not be so obvious. Let's look at a more clear cut example. Consider this breakdown of revenues by geographic area.

Geographic Areas

Revenues by geographic areas were as follows for the years ended December 31 (thousands):

	2010	2009
NORTH AMERICA:		
United States	4,000	4,000
Canada	2,000	2,000
Total North America	6,000	6,000
EUROPE:		
United Kingdom	2,000	2,000
Germany	2,000	2,000
Total Europe	4,000	4,000
Total	10,000	10,000

This information could be modelled by creating 7 concepts such as:

- Revenues, North America
- Revenues, United States
- Revenues, Canada
- Revenues, Europe
- Revenues, United Kingdom
- Revenues, Germany
- Revenues

Looking at those concepts, you see that the concepts have two pieces of descriptive information: "revenues" which describes the type of concept and geographic type information.

This type of pattern tends to scream out for the use of an [Axis] for the geographic areas which could be used to characterize the one concept "Revenues".

Other factors which should be considered when trying to determine the best approach to model this information is:

- How the information aggregates to other information in your model.
- How the information ties to other information within your model.
- Other modelling decisions which you have already made which push you toward one specific option or another.

18.6. Understanding XBRL calculation inconsistencies

Generally you do not want calculation inconsistencies (they are really called inconsistencies, not errors) in your SEC XBRL filing. Many SEC filers can avoid all calculation inconsistencies. Sometimes though you cannot. The technical reason for this is that certain facts reported with certain periods sometimes get included in calculations which they should not actually be included in. This is a known situation in XBRL and is unavoidable. This is not the same thing as calculations which should add up but don't.

Some people think that using dimensions causes calculation errors. This is not the case. Using dimensions or not using dimensions does not cause calculation errors. Using dimensions incorrectly can lead to calculation errors.

These are the following reasons that a calculation linkbase error (actually the more correct term is calculation inconsistencies) might show up:

1. Because there truly are calculation inconsistencies.
2. Because of a taxonomy modelling error such as erroneously mixing two dimensional models together.
3. Due to SEC constraints imposed upon XBRL instance creation.
4. Due to "stray facts" being used by an XBRL processor in computations of a network where there is no intension that the fact value should be used. (This is a known issue with XBRL and caused by the lack of constraints on typically the period context, but it could also be caused by the entity identifier context.)

If "1" is the case, then the calculation inconsistency should clearly be fixed and this would resolve any issue of calculation inconsistencies showing up.

An example of "2" is on the balance sheet, modelling all balance sheet line items as concepts and then switching to model the classes of stock as [Axis] of a concept, for example if a company has two classes of stock, Class A common and Class B common. The way to avoid calculation inconsistencies is to create a concept for Class A common and a concept for Class B common; then there would be no calculation inconsistency. But see the discussion on point "3".

The SEC states that if information is not shown on the HTML financial statement then it should not be present in the XBRL instance. Using the classes of stock example where a company has two classes of stock, from a data modelling perspective, the class of stock breakdown would be something like:

Class A Common	100
Class B Common	200
Total Common	300

The value "300" is never really reported on a financial statement. However, from a data modelling perspective it is the true link between two [Table]s, the "Balance Sheet [Table]" and the "Classes of Common Stock [Table]". Class of stock information other than the value of each class of stock is shown such as par value, shares authorized, shares issued, shares outstanding, etc. That information does not fit into a balance sheet model, it fits into the class of stock model. If one things of all this from a "presentation" perspective, one reaches different conclusions as to how the information should be modelled. From a data modelling perspective, the conclusions reached would be different. If the information is modelled correctly from a data modelling perspective, it is a trivial task for a computer application to take the information needed from the Class of Stock [Table] and render it correctly on the Balance Sheet [Table]. However, if the information is modelled from a presentation perspective, the connection between the balance sheet and the class of stock information does not exist.

The bottom line for points "2" and "3" are that how people think about the information in an XBRL instance, from a presentation perspective or from a data

modelling perspective will highly likely mature when users realize that modelling information from a data modelling perspective really does not hurt their ability to present the information how they desire to present it; but modelling information from a presentation perspective hurts the ability to analyze the information.

There is a known issue with XBRL which point "4" shows. Say a company shows a balance sheet with two periods, December 31, 2010 and 2009. There are concepts relating to each balance sheet for those periods and the calculations for both of those periods work correctly. But, in another area of the financial statement, "Cash and cash equivalents", "Receivables", and "Current Assets" is disclosed for 2008. What an XBRL processor will try to do is put the concepts together and try and create a balance sheet and validate that balance sheet for the period 2008, but the calculations will not be consistent because there is no "Inventory" or "Prepaid expenses" disclosed which would be needed to actually confirm that the "Current Assets" value is correct. This is a known problem which occurs in XBRL which is due to the lack of a way to constrain the period (and also the entity identifier) from a network of concepts (i.e. an extended link of a specific role), and therefore calculation inconsistencies may occur which you cannot remove from your XBRL instance.

18.7. Restricting XBRL data types

XBRL can use XML Schema Part 2, Data types (see the specification at http://www.w3.org/TR/xmlschema-2/) to restrict what creators of financial reports can use as fact values. This can be quite useful in maintaining data quality.

For example, here are some types of restrictions which could be used:

- Setting a specific length, a minimum length, or a maximum length of a fact value, such as limiting the value to 10 characters
- Providing an enumerated lists of specific values which can be provided, such as the enumerated list: red, blue, green, orange.
- Providing a specific pattern for example the pattern of a phone number (XXX-XXX-XXXX) or of a social security number (XXX-XX-XXXX).

Going into details is beyond the scope of this document. However, we did want to mention this powerful features availability should you feel you need it.

19. Concept Arrangement Pattern Examples

The world is full of patterns and information technology engineers and architects leverage these patterns when trying to get a computer to do something effectively and efficiently for humans. Understanding the patterns which exist can help make both building and using software easier.

Business reports, including financial reports, have patterns. Another way of saying this is that financial reports are not random. There are not an infinite number of patterns in financial reporting.

The metapattern examples in this section are distilled from the set of *Business Use Case Examples* which are provided in the next section. The metapatterns are the essence of each business use case.

Business Reporting Use Case Examples, introduces a set of approximately 30 financial reporting use cases collected over a number of years. That set of 30 business use cases was condensed from many, many different financial reporting use cases examined in order to understand how to model financial information.

> HINT: The *US GAAP Taxonomy Architecture* refers to these metapatterns as compact pattern definitions and documents a number of these metapatterns in what it refers to as style guides. These style guides were never released publicly but they are referred to in the US GAAP Taxonomy Architecture. Everything within the US GAAP Taxonomy fits into one or a combination of these metapatterns.

Metapatterns explain the business semantics and mechanics within each of these business reporting situations or use cases. These smaller metapatterns are very helpful in understanding what is going on in a digital financial report. All digital financial report information from the business use cases, the comprehensive example, the financial disclosure templates, the reference implementation, or of the thousands of SEC XBRL financial filings can be distilled into this set of metapatterns.

These metapatterns can also be seen as "accounting concept arrangement patterns" or "line item arrangement patterns" as that is what the metapattern is captures and tried to communicate: arrangement of concepts.

Perhaps other metapatterns exist. If that is the case, the list of metapatterns can simply be expanded.

You can obtain example XBRL instances and XBRL taxonomies and other information for each of these metapatterns which is helpful in understanding these metapatterns at the following URL:

http://www.xbrlsite.com/DigitalFinancialReporting/Metapatterns/2013-05-15

It is important to examine the details of these metapatterns, that is where the clues lie which provide understanding of each metapattern and the differences between the metapatterns. We now provide key information which is helpful in gaining an understanding of these financial reporting metapatterns. Each uses a financial reporting oriented example as most business professionals understand financial reporting to a sufficient degree.

19.1. Hierarchy

A *hierarchy* information model denotes a hierarchy of concepts with no numeric relations. If no numeric relations exist, then the information model of the component is a hierarchy. Basically, anything can be modelled as a hierarchy. It is the addition of additional relations, typically mathematical computations, which turns a hierarchy into some other metapattern.

The *hierarchy* metapattern models a hierarchy or a tree of information. A hierarchy can contain business rules such as reportability rules which helps one understand when specific information must be reported.

19.1.1. Visual Example

Sample Company
December 31, 2010

Basis of Reporting

Praesent fringilla feugiat magna. Suspendisse et lorem eu risus convallis placerat. Suspendisse potenti. Donec malesuada lorem id mi. Nunc ut purus ac nisl tempus accumsan.

Trade receivables
Sed magna felis, accumsan a, fermentum quis, varius sed, ipsum. Nullam leo. Donec eros.

Inventories
Inventory valuation method
Cost

Description of components
Proin elit sem, ornare non, ullamcorper vel, sollicitudin a, lacus. Mauris tincidunt cursus est. Nulla sit amet nibh. Sed elementum feugiat augue. Nam non tortor non leo porta bibendum. Morbi eu pede.

Cost method
FIFO

Investments in securities
Etiam ipsum orci, gravida nec, feugiat ut, malesuada quis, mauris. Etiam porttitor. Ut venenatis, velit a accumsan interdum, odio metus mollis mauris, non pharetra augue arcu eu felis.

Bank borrowings
Ut ut risus nec nibh dictum posuere. Phasellus eleifend, diam vitae dapibus pulvinar, erat ligula auctor dui, eget congue justo lorem hendrerit tellus.

Provisions
Suspendisse vestibulum augue eu justo. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

19.1.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	20000 - Accounting Policies (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/Hierarchy/AccountingPolicies)
Table	Accounting Policies [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Accounting Policies [Line Items]	Period [Axis] 2010-01-01 - 2010-12-31
Accounting Policies [Hierarchy]	
Basis of Presentation	Praesent fringilla feugiat magna. Suspendisse et lorem eu risus convallis placerat. Suspendisse potenti. Donec malesuada lorem id mi. Nunc ut purus ac nisl tempus accumsan.
Trade Receivables Policy	Sed magna felis, accumsan a, fermentum quis, varius sed, ipsum. Nullam leo. Donec eros.
Inventory Policies [Abstract]	
Inventory Valuation Method	Cost
Description of Inventory Components	Proin elit sem, ornare non, ullamcorper vel, sollicitudin a, lacus. Mauris tincidunt cursus est. Nulla sit amet nibh. Sed elementum feugiat augue. Nam non tortor non leo porta bibendum. Morbi eu pede.
Inventory Cost Method	FIFO
Investments in Securities Policy	Etiam ipsum orci, gravida nec, feugiat ut, malesuada quis, mauris. Etiam porttitor. Ut venenatis, velit a accumsan interdum, odio metus mollis mauris, non pharetra augue arcu eu felis.
Bank Borrowings Policy	Ut ut risus nec nibh dictum posuere. Phasellus eleifend, diam vitae dapibus pulvinar, erat ligula auctor dui, eget congue justo lorem hendrerit tellus.
Provisions Policy	Suspendisse vestibulum augue eu justo. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

19.1.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	20000 - Accounting Policies (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/Hierarchy/AccountingPolicies)
Table	Accounting Policies [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Accounting Policies [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Accounting Policies [Line Items]**	[Line Items]		
5	*Accounting Policies [Hierarchy]*	[Abstract]		
6	Basis of Presentation	[Concept] String	For Period	
7	Trade Receivables Policy	[Concept] String	For Period	
8	*Inventory Policies [Abstract]*	[Abstract]		
9	Inventory Valuation Method	[Concept] String	For Period	
10	Description of Inventory Components	[Concept] String	For Period	
11	Inventory Cost Method	[Concept] String	For Period	
12	Investments in Securities Policy	[Concept] String	For Period	
13	Bank Borrowings Policy	[Concept] String	For Period	
14	Provisions Policy	[Concept] String	For Period	

19.1.4. Business Rules

A hierarchy has no mathematical computations, and therefore it has no mathematical business rules. However, each component might have business rules related to the existence of certain specific facts, dependency type relations such as "if Fact A is reported, then Fact B must also be reported".

19.1.5. Description

The example shows a *Hierarchy* of accounting policies. If you are familiar with something like the outline feature of Microsoft Word then you know what a hierarchy is. There are no explicit relationships between concepts within this type of information model because XBRL most taxonomies don't generally distinguish between the types of relations. They could, but they currently do not. As such, we make no distinction between types of relations. Again, by definition everything is a *Hierarchy* unless additional information is added which turns the hierarchy into some other metapattern.

A *Hierarchy* can always be identified by a software application by the fact that there are no XBRL calculations or other business rules expressing computations within the taxonomy.

19.1.6. Extension Points

The following are the logical extension points for a *Hierarchy* metapattern:

- Add new [Axis]
- Add new [Member] to [Axis]
- Add new concepts to [Line Items] of *Hierarchy*

19.2. Roll up

A *roll up* information model computes a total from a set of other concepts. This information model is commonly referred to a "roll up", or by the equation A + B = C. All facts involved in this information model have the same set of characteristics and all must be numeric.

The *roll Up* metapattern can be thought of as a hierarchy metapattern with additional constraints. One additional constraint is that the total and the components of the total must all be numeric and of the same data type. Another constraint is that a business rule for the relations between the total and the set of concept which make up that total is expressed.

19.2.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	2010	2009
Property, Plant, and Equipment, Net		
Land	5,347	1,147
Buildings, Net	244,508	366,375
Furniture and Fixtures, Net	34,457	34,457
Computer Equipment, Net	4,169	5,313
Other Property, Plant, and Equipment, Net	6,702	6,149
Property, Plant and Equipment, Net, Total	295,183	413,441

19.2.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	30000 - Property, Plant, and Equipment, by Component (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/RollUp/PropertyPlantAndEquipmentByComponent)
Table	Property, Plant and Equipment, by Component [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Property, Plant and Equipment, by Component [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Property, Plant and Equipment, Net [Roll Up]		
Land	5,347,000	1,147,000
Buildings, Net	244,508,000	366,375,000
Furniture and Fixtures, Net	34,457,000	34,457,000
Computer Equipment, Net	4,169,000	5,313,000
Other Property, Plant and Equipment, Net	6,702,000	6,149,000
Property, Plant and Equipment, Net, Total	295,183,000	413,441,000

19.2.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	30000 - Property, Plant, and Equipment, by Component (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/RollUp/PropertyPlantAndEquipmentByComponent)
Table	Property, Plant and Equipment, by Component [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Property, Plant and Equipment, by Component [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Property, Plant and Equipment, by Component [Line Items]**	[Line Items]		
5	*Property, Plant and Equipment, Net [Roll Up]*	[Abstract]		
6	Land	[Concept] Monetary	As Of	Debit
7	Buildings, Net	[Concept] Monetary	As Of	Debit
8	Furniture and Fixtures, Net	[Concept] Monetary	As Of	Debit
9	Computer Equipment, Net	[Concept] Monetary	As Of	Debit
10	Other Property, Plant and Equipment, Net	[Concept] Monetary	As Of	Debit
11	Property, Plant and Equipment, Net, Total	[Concept] Monetary	As Of	Debit

19.2.4. Business Rules

Roll up total = sum of the concepts which make up the roll up.

19.2.5. Description

The *Roll Up* in the example above is a set of five concepts which add up to a sixth concept: Land + Buildings, Net + Furniture and Fixtures, Net + Computer Equipment, Net + Other Property, Plant and Equipment, Net = Property, Plant and Equipment, Net, Total. A *Roll Up* can have other Roll Ups within (i.e. nested), what amount to sub totals.

A *Roll Up* can always be identified by a software application by its set of XBRL calculations within the XBRL taxonomy.

19.2.6. Extension Points

The following are extension points for a *Roll Up* metapattern:

- Add new [Axis]
- Add new [Member] to [Axis]
- Add new concepts to the concepts being rolled up (i.e. a new total concept cannot be added, that would require an entirely new roll up); for example, adding "Airplanes" to the roll up above would make sense but adding another concept "Property, Plant and Equipment" would not make sense

19.3. Roll forward

A *roll forward* information model reconciles the balance of a concept between two points in time. This information model is commonly referred to a "roll forward" or "movement analysis" or by the equation: beginning balance + changes = ending balance. In this equation, the Period [Axis] is as of two different points in time and the changes occur during the period between those two points in time.

The changes within a *roll forward* could take the form of one concept, a set of many change concepts, or one or more *roll ups* which aggregate to change concepts.

19.3.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	2010	2009
Roll Forward of Land		
Land, Beginning Balance	1,147	1,147
Additions	1,992	400
Disposals	-193	-200
Translation difference	2,401	-200
Land, Ending Balance	5,347	1,147

19.3.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	40000 - Roll Forward of Land (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/RollForward/RollForwardOfLand)
Table	Land Changes [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Land Changes [Line Items]	Period [Axis]	
	2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31
Roll Forward of Land [Roll Forward]		
Land, Beginning Balance	1,147,000	1,147,000
Land, Period Increase (Decrease), Total [Roll Up]		
Land, Additions	1,992,000	400,000
Land, Disposals	(193,000)	(200,000)
Land, Translation Difference	2,401,000	(200,000)
Land, Period Increase (Decrease), Total	4,200,000	0
Land, Ending Balance	5,347,000	1,147,000

19.3.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	40000 - Roll Forward of Land (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/RollForward/RollForwardOfLand)
Table	Land Changes [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Land Changes [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Land Changes [Line Items]**	[Line Items]		
5	*Roll Forward of Land [Roll Forward]*	[Abstract]		
6	Land, Beginning Balance	[Concept] Monetary	As Of	Debit
7	*Land, Period Increase (Decrease), Total [Roll Up]*	[Abstract]		
8	Land, Additions	[Concept] Monetary	For Period	Debit
9	Land, Disposals	[Concept] Monetary	For Period	Credit
10	Land, Translation Difference	[Concept] Monetary	For Period	Debit
11	Land, Period Increase (Decrease), Total	[Concept] Monetary	For Period	Debit
12	Land, Ending Balance	[Concept] Monetary	As Of	Debit

19.3.4. Business Rules

Ending balance = Beginning balance +/- each change

19.3.5. Description

The *Roll Forward* above reconciles the beginning balance of Land to the ending balance of Land. The XBRL instance provides Facts for two Roll Forwards, 2010 and 2009. Land, Beginning Balance + Additions – Disposals + Translation Difference = Land, Ending Balance. In the case above, the change concept is the total of a roll up.

A *Roll Forward* can be identified by the business rule which must be used to verify the computation of the reconciliation, beginning balance + changes = ending balance with a changing Period [Axis].

19.3.6. Extension Points

The following are extension points for a *Roll Forward* metapattern:

- Add new [Axis]
- Add new [Member] to [Axis]
- Add new concepts to the *Roll Up* of changes; (a new balance concept would never be added)
- Add a new *Roll Up* of changes or one or more change concepts; (i.e. a roll forward can have one or many changes)

Note that there are two approaches to modelling a roll forward. The first is to create a roll up to summarize all changes and then model only one change concept. The second is to not use a roll up and model each change separately. Semantically, the two are equivalent.

19.4. Compound fact

A *compound fact* information model is characterized by the notion that for some set of concepts expressed within some information model; that information model can be expressed over some characteristic expressed as an [Axis]. Basically, it is the [Axis] which provides additional information which further contextualizes some fact or facts which makes each information model unique.

For example, the salary information for the directors of an entity is a compound fact. The salary information is made up of salary, bonuses, director fees and such information must be associated with a specific director to be meaningful and to distinguish, say, one salary from another salary.

19.4.1. Visual Example

Sample Company
For Period Ending December 31, 2010

Director	Salary	Bonus	Director Fee	Options Granted, at Fair Value
pattern:JohnDoeMember	1,000	1,000	1,000	1,000
pattern:JaneDoeMember	1,000	1,000	1,000	1,000
frm:DirectorsAllMember	2,000	2,000	2,000	2,000

19.4.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	50000 - Director Compensation (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/CompoundFact/DirectorCompensation)
Table	Director Compensation [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Period [Axis]	2010-01-01 - 2010-12-31
Legal Entity [Axis]	Consolidated Entity [Member]

Director Compensation [Line Items]	Director [Axis]		
	John Doe [Member]	Jane Doe [Member]	Directors, All [Member]
Director [Hierarchy]			
Director, Salary	1,000	1,000	2,000
Director, Bonuses	1,000	1,000	2,000
Director, Fees	1,000	1,000	2,000
Director, Options Granted, at Fair Value	1,000	1,000	2,000

19.4.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	50000 - Director Compensation (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/CompoundFact/DirectorCompensation)
Table	Director Compensation [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Director Compensation [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Director [Axis]**	[Axis]		
5	Directors, All [Member]	[Member]		
6	John Doe [Member]	[Member]		
7	Jane Doe [Member]	[Member]		
8	**Director Compensation [Line Items]**	[Line Items]		
9	*Director [Hierarchy]*	[Abstract]		
10	Director, Salary	[Concept] Monetary	For Period	Credit
11	Director, Bonuses	[Concept] Monetary	For Period	Credit
12	Director, Fees	[Concept] Monetary	For Period	Credit
13	Director, Options Granted, at Fair Value	[Concept] Monetary	For Period	Credit

19.4.4. Business rules

May have a business rule related to the metapattern expressed within the compound fact. May have a business rule related to the aggregation of the members of one or more axes.

19.4.5. Description

In the example above salary information is expressed for the directors of an entity. The salary information (salary, bonus, director fee, and options granted) are the concepts which make up the compound fact. The director is the axis along which the salary information is expressed, here for the members John Doe, Jane Doe, and the total salary information for all directors.

Any information model could be expressed as a compound fact. In the example above the information model is a hierarchy. This information model might have also been modelled as a roll up had a total of all salary information been provided.

19.4.6. Extension Points

The following are extension points for a *compound fact* metapattern:

- Add new [Member] to [Axis] (generally, a new [Axis] would not be added but might be to further detail the primary characteristic)
- Add new concepts to [Line Items]
- Basically, extension points are determined by the specific information model of the compound fact

19.5. Adjustment

An *adjustment* information model reconciles an originally stated balance to a restated balance, the adjustment being the total change, between two different report dates. An adjustment is similar to a *roll forward* in that it is a reconciliation, however rather than the Period [Axis] changing; it is the *Report Date [Axis]* which changes: originally reported balance + adjustment = restated balance.

The *Adjustment* metapattern shows how to model an adjustment to a prior period financial statement for a change in accounting policy or correction of an error as defined by financial reporting standards. This same approach can be used for making adjustments to other beginning balances.

19.5.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	2010	2009
Prior Period Adjustment		
Retained Earnings (Accumulated Losses), Originally Stated 2009	4,000	
Change in Accounting Policy	3,000	
Correction of an Error	-1,000	
Retained Earnings (Accumulated Losses), Restated 2009 Beginning Balance	6,000	

19.5.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	50000 - Prior Period Adjustments (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/Adjustment/PriorPeriodAdjustments)
Table	Prior Period Adjustments [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Prior Period Adjustments [Line Items]	Report Date [Axis]	Period [Axis] 2009-12-31
Retained Earnings (Accumulated Losses), Origionally Stated	Reported March 21, 2010 [Member]	4,000
Changes in Accounting Policy	Reported March 18, 2011 [Member]	3,000
Correction of an Error	Reported March 18, 2011 [Member]	(1,000)
Prior Period Adjustments, Period Increase (Decrease), Total	Reported March 18, 2011 [Member]	2,000
Retained Earnings (Accumulated Losses), Restated	Reported March 18, 2011 [Member]	6,000

19.5.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	50000 - Prior Period Adjustments (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/Adjustment/PriorPeriodAdjustments)
Table	Prior Period Adjustments [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Prior Period Adjustments [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Report Date [Axis]**	[Axis]		
5	Reported March 21, 2010 [Member]	[Member]		
6	Reported March 18, 2011 [Member]	[Member]		
7	**Prior Period Adjustments [Line Items]**	[Line Items]		
8	*Prior Period Adjustments to Retained Earnings [Adjustment]*	[Abstract]		
9	Retained Earnings (Accumulated Losses), Origionally Stated	[Concept] Monetary	As Of	Credit
10	*Prior Period Adjustments, Period Increase (Decrease), Total [Roll Up]*	[Abstract]		
11	Changes in Accounting Policy	[Concept] Monetary	As Of	Credit
12	Correction of an Error	[Concept] Monetary	As Of	Credit
13	Prior Period Adjustments, Period Increase (Decrease), Total	[Concept] Monetary	As Of	Credit
14	Retained Earnings (Accumulated Losses), Restated	[Concept] Monetary	As Of	Credit

19.5.4. Business Rules

Restated balance = Originally stated balance +/- each adjusting concept.

19.5.5. Description

The example *Adjustment* above reconciles the Retained Earnings (Accumulated Losses), Originally Stated in 2009 to its Restated 2009 Beginning Balance via the Prior Period Adjustments which make up the change. Note that an *Adjustment* looks similar in presentation to a roll forward, however it is different in that a different [Axis] is changing.

An *Adjustment* can be identified by software applications by the business rule which computes the adjustment to verify that it is correctly articulated within the XBRL instance: originally stated + adjustment = restated balance over a changing *Report Date [Axis]*.

19.5.6. Extension Points

The following are extension points for an *Adjustment* metapattern:

- Add new [Axis]
- Add new [Member] to [Axis]
- Add new adjustment concepts to [Line Items] of the adjustment; (new balance concepts cannot be added)

19.6. Variance

A *variance* information model reconciles some reporting scenario with another reporting scenario, the variance between reporting scenarios being the variance or changes between the two reporting scenarios. For example, a sales analysis which reconciles the concept sales for the reporting scenarios of actual and budgeted is a variance. The equation in this case is: actual – budget = variance. But a variance could take other forms such as a variance from forecast, variance from plan, etc.

A *variance* is distinguished by a changing *Reporting Scenario [Axis]* and the information model of a variance could take the form of any information model such as a hierarchy, roll up, roll forward, etc.

19.6.1. Visual Example

Sample Company
For Period Ending December 31, 2010

Concept	Actual	Budgeted	*Variance*
Sales	6,000	5,000	*1,000*
Cost of Goods Sold	4,000	3,000	*1,000*
Contribution Margin	1,000	2,000	*-1,000*
Distribution Costs	1,000	1,000	*0*

19.6.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	60000 - Variance Analysis (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/Variance/VarianceAnalysis)
Table	Variance Analysis [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Period [Axis]	2010-01-01 - 2010-12-31
Legal Entity [Axis]	Consolidated Entity [Member]

Variance Analysis [Line Items]	Reporting Scenario [Axis]		
	Actual [Member]	Budgeted [Member]	Reporting Scenarios, All [Member]
Variance Analysis [Hierarchy]			
Sales	6,000	5,000	1,000
Cost of Goods Sold	4,000	3,000	1,000
Contribution Margin	1,000	2,000	(1,000)
Distribution Costs	1,000	1,000	0

19.6.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	60000 - Variance Analysis (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/Variance/VarianceAnalysis)
Table	Variance Analysis [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Variance Analysis [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Reporting Scenario [Axis]**	[Axis]		
5	Reporting Scenarios, All [Member]	[Member]		
6	Actual [Member]	[Member]		
7	Budgeted [Member]	[Member]		
8	**Variance Analysis [Line Items]**	[Line Items]		
9	*Variance Analysis [Hierarchy]*	[Abstract]		
10	Sales	[Concept] Monetary	For Period	Credit
11	Cost of Goods Sold	[Concept] Monetary	For Period	Debit
12	Contribution Margin	[Concept] Monetary	For Period	Credit
13	Distribution Costs	[Concept] Monetary	For Period	Debit

19.6.4. Business Rules

Variance = Actual amount – budgeted amount.

19.6.5. Description

A *Variance* reconciles two different reporting scenarios differentiated using the *Reporting Scenarios [Axis]*, in the case here *Actual [Member]* and *Budgeted [Member]*, the difference being the Variance, or *Reporting Scenarios, All [Member]*.

A *Variance* can be identified by software applications by the business rule which verifies and computes the variance, Actual [Member] + Budgeted [Member] = Reporting Scenarios, All [Member], all within the *Reporting Scenario [Axis]*.

[CSH: The Reporting Scenarios, All [Member] as the variance seems odd to me; this should probably be Variance [Member].]

19.6.6. Extension Points

The following are extension points for a *Variance* metapattern:

- Add new [Axis]
- Add new [Member] to an [Axis]
- Add new concepts to [Line Items]

What can change is determined by the information model of the concepts for which a variance is being expressed.

19.7. Complex computation

A *complex computation* information model can be thought of as a hierarchy plus a set of mathematical commutations between different concepts within that hierarchy which are more challenging to model than a *roll up* or *roll forward*. The type of computations can vary significantly, thus the challenging in modelling. For example, the computation of earnings per share is a complex computation.

Basically, any *hierarchy* can be turned into a *complex computation* by adding business rules which express relations between the concepts within the [Line Items] of that *hierarchy*.

19.7.1. Visual Example

Sample Company
For Period Ended December 31,

	2010	2009
OTHER INFORMATION		
Earnings Per Share Components		
Net Income (Loss)	10,000,000	20,000,000
Weighted Average Common Shares	100,000,000	100,000,000
Earnings Per Share	0.10	0.20

19.7.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	70000 - Earnings Per Share Components (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/ComplexComputation/EarningsPerShareComponents)
Table	Earnings Per Share Components [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Earnings Per Share Components [Line Items]	Period [Axis]	
	2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31
Earnings Per Share Components [Hierarchy]		
Net Income (Loss)	10,000,000	20,000,000
Weighted Average Common Shares	100,000,000	100,000,000
Earnings Per Share	.10	.20

19.7.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	70000 - Earnings Per Share Components (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/ComplexComputation/EarningsPerShareComponents)
Table	Earnings Per Share Components [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Earnings Per Share Components [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Earnings Per Share Components [Line Items]**	[Line Items]		
5	*Earnings Per Share Components [Hierarchy]*	[Abstract]		
6	Net Income (Loss)	[Concept] Monetary	For Period	Credit
7	Weighted Average Common Shares	[Concept] Shares	For Period	
8	Earnings Per Share	[Concept] Decimal	For Period	

19.7.4. Business Rules

A complex computation can be any mathematical relation expressed between the facts which make up the complex computation. In this example, earnings per share = net income (loss) / weighted average common shares.

19.7.5. Description

A *Complex Computation* metapattern is in essence a *Hierarchy* metapattern with *Business Rules* which express complex relations between numeric values contained in that hierarchy. In the example above, Earnings Per Share is expressed in relation to Net Income and Weighted Average Common Shares. The Weighted Average Common Shares computation is also expressed as a business rule.

An *Complex Computation* metapattern can always be identified by software as it does not fit into any other metapattern category. It will have some XBRL Formula, but it will not match any of the other XBRL Formulas for the other metapatterns.

19.7.6. Extension Points

The following are extension points for a *Complex Computation* metapattern:

- Add new [Axis]
- Add new [Member] to [Axis]
- Add new concepts to [Line Items]
- Add new business rules to set of relations

19.8. Text block

A *text block* information model is an information model which contains, by definition, only one concept and that concept expresses what amounts to a narrative or prose as escaped XHTML within that one concept. For example, the narrative associated with a set of accounting policies expressed as a list or a table presentation format is a *text block*. As there is only one concept, there can be no relations within the information model.

19.8.1. Visual Example

Duis fermentum

Sed mauris. Nulla facilisi. Fusce tristique posuere ipsum. Nulla facilisi. Aliquam viverra risus vitae ante. Sed rhoncus mi in wisi. Nullam nibh dui, molestie vitae, imperdiet non, ornare at, elit.

- Suspendisse accumsan, arcu vel ornare interdum, magna tellus porta mauris, in porta mi lacus sodales felis.
- Phasellus eleifend, diam vitae dapibus pulvinar, erat ligula auctor dui, eget congue justo lorem hendrerit tellus.
- Fusce gravida, ligula a placerat placerat, leo erat euismod lectus, et lacinia justo libero non pede.

DONEC PULVINAR NONUMMY ERAT

Etiam porttitor. Ut venenatis, velit a accumsan interdum, odio metus mollis mauris, non pharetra augue arcu eu felis. Ut eget felis. Mauris leo nulla, sodales et, pharetra quis, fermentum nec, diam.

19.8.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	20000 - Accounting Policies (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/TextBlock/AccountingPolicies)
Table	Accounting Policies [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Accounting Policies [Line Items]	Period [Axis]
	2010-01-01 - 2010-12-31
Accounting Policies [Text Block]	Duis fermentum Sed mauris. Nulla facilisi. Fusce tristique posuere ipsum. Nulla facilisi. Aliquam viverra risus vitae ante. Sed rhoncus mi in wisi. Nullam nibh dui, molestie vitae, imperdiet non, ornare at, elit. • Suspendisse accumsan, arcu vel ornare interdum, magna tellus porta mauris, in porta mi lacus sodales felis. • Phasellus eleifend, diam vitae dapibus pulvinar, erat ligula auctor dui, eget congue justo lorem hendrerit tellus. • Fusce gravida, ligula a placerat placerat, leo erat euismod lectus, et lacinia justo libero non pede. Fusce gravida, ligula a placerat placerat, leo erat euismod lectus, et lacinia justo libero non pede. Vivamus ac velit vel magna nonummy pretium. 1. Etiam ut augue 2. Aliquam erat volutpat DONEC PULVINAR NONUMMY ERAT Etiam porttitor. Ut venenatis, velit a accumsan interdum, odio metus mollis mauris, non pharetra augue arcu eu felis. Ut eget felis. Mauris leo nulla, sodales et, pharetra quis, fermentum nec, diam.

19.8.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	20000 - Accounting Policies (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/TextBlock/AccountingPolicies)
Table	Accounting Policies [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Accounting Policies [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Accounting Policies [Line Items]**	[Line Items]		
5	Accounting Policies [Text Block]	[Concept] String	For Period	

19.8.4. Business Rules

None

19.8.5. Description

Any portion of a financial report can be modelled as a [Text Block], referred to as "block tagged". Alternatively, any portion could also be "detailed tagged" using one of the other information model metapatterns.

19.8.6. Extension Points

The following are extension points for a *Text Block* metapattern:

- Add new [Axis]
- Add new [Member] to [Axis]

19.9. Grid

A *grid* information model is a pseudo metapattern which uses the presentation format of the columns and rows of a table to model information. Because the grid models presentation information and not business semantics, it cannot be considered a metapattern. However, the grid is included in this list because the US GAAP Taxonomy uses a grid information model to model the statement of changes in equity.

19.9.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	Common Stock	Additional Paid-in Capital	Retained Earnings (Accumulated Deficit)	Equity
Balance at December 31, 2009	150,000	50,000	200,000	400,000
Net Income (Loss)			200,000	200,000
Dividends			-100,000	-100,000
Common Stock Issued	25,000	25,000		50,000
Balance at December 31, 2010	175,000	75,000	300,000	550,000

HINT: In a grid, the axis are generally the columns of the grid and the concepts reported are the rows of the grid. Because the axis are unique to the grid and the rows repeat for every fact value reported, many portions of a grid cannot tie to other components of a financial report.

19.9.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	90000 - Statement of Changes in Equity (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/Grid/StatementOfChangesInEquity)
Table	Statement of Changes in Equity [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Period [Axis]	2010-01-01 - 2010-12-31
Legal Entity [Axis]	Consolidated Entity [Member]

Statement of Changes in Equity [Line Items]	Equity Component [Axis]			
	Common Stock [Member]	Additional Paid -in Capital [Member]	Retained Earnings (Accumulated Deficit) [Member]	Equity [Member]
Statement of Changes in Equity [Grid]				
Equity, Beginning Balance	150,000	50,000	200,000	400,000
Net Income (Loss)			200,000	200,000
Dividends			(100,000)	(100,000)
Common Stock Issued	25,000	25,000		50,000
Equity, Ending Balance	175,000	75,000	300,000	550,000

19.9.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	90000 - Statement of Changes in Equity (http://www.xbrlsite.com/DigitalFinancialReporting/Metapattern/Grid/StatementOfChangesInEquity)
Table	Statement of Changes in Equity [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Statement of Changes in Equity [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Equity Component [Axis]**	[Axis]		
5	Equity [Member]	[Member]		
6	Common Stock [Member]	[Member]		
7	Additional Paid-in Capital [Member]	[Member]		
8	Retained Earnings (Accumulated Deficit) [Member]	[Member]		
9	**Statement of Changes in Equity [Line Items]**	[Line Items]		
10	*Statement of Changes in Equity [Grid]*	[Abstract]		
11	Equity, Beginning Balance	[Concept] Monetary	As Of	Credit
12	Net Income (Loss)	[Concept] Monetary	For Period	Credit
13	Dividends	[Concept] Monetary	For Period	Debit
14	Common Stock Issued	[Concept] Monetary	For Period	Credit
15	Equity, Ending Balance	[Concept] Monetary	As Of	Credit

19.9.4. Business Rules

None

19.9.5. Description

The grid is used to model the statement of changes in equity above. The axis Equity Component [Axis] assigned to a fact indicates which column the fact belongs in. The [Line Items] determines the rows of the table. The cells of the table are the intersections between the Equity Component [Axis] and the concept of the set of [Line Items] of the fact which should go into that cell.

19.9.6. Extension Points

The following are extension points for a *Grid* metapattern:

- Add new [Axis]
- Add new [Member] to [Axis]
- Add a new concept to [Line Items]

20. Business Use Case Examples

This section explores each of the business use cases summarized in the previous section. Please be sure to become familiar with the previous section and the additional background material pointed to in that section.

Keep the following thought in the back of your mind as you work through this material: Mathematics is used in accounting, engineering, medicine, architecture, science, and other domains. Yet mathematics is exactly the same in each domain, it is only applied solving different domain problems. This is likewise the case for the business use cases covered by this section; they are applicable to many types of financial or non-financial business reporting.

20.1. Overview of business use cases

The following provides an overview of the business use cases. This overview is intended to help the reader compare and contrast the different business use cases provided. The business use cases provided are hard to dispute. There are likely other business use cases which are not shown. Each business use case listed is provided for one or more specific reasons to highlight one or more unique characteristics which it possess.

The business use cases tend to be financial reporting related. This is true for two reasons. First, that is where the primary use of XBRL is right now and I am a CPA trying to show other CPAs how to work with XBRL within the domain of financial reporting. Second, most business professionals understand financial reporting enough to understand these examples. It should be quite easy for a business user to take the principles articulated in these financial reporting related business use cases and apply those principles to the practice of modelling other areas of financial reporting.

Here is a summary of the business use cases.

#	Title	Description
BUC01	Flat Hierarchy	Metapattern. One level flat hierarchy. No computations.
BUC02	Nested Hierarchy	Variation of hierarchy. Multi-level nested hierarchy. No computations.
BUC03	Simple Roll Up	Metapattern. Simple hierarchy of numeric facts with a roll up type of computation. Computation where A + B + n = Total.
BUC04	Nested Roll Up	Variation of roll up. Nesting one roll up inside another roll up.
BUC05	Inverted Roll Up	Variation of roll up. Multi-level nested roll up. Multiple levels of nested roll ups.
BUC06	Multiple Roll Ups	Variation of roll up. One total rolled up in more than one way forcing roll ups to be expressed within separate networks.
BUC07	Simple Roll Forward	Metapattern. Simple roll forward of one balance. Also known as movement analysis. Reconciles the changes between two balances, beginning balance + changes = ending balance.
BUC08	Complex Roll Forward	Variation of Roll Forward. Roll forward of multiple balances which roll up.

#	Title	Description
BUC09	Simple Compound Fact	Metapattern. Set of facts which go together to form a compound fact. Facts are held together by an axis.
BUC10	Repeating Fact	Variation of Compound Fact. Similar to simple compound fact, points out that fact can repeat.
BUC11	Multiple Periods Compound Fact	Variation of Compound Fact. Simple compound fact which has more than one period disclosed within the compound fact.
BUC12	Roll Forward in Compound Fact	Variation of Roll Forward. Roll forward within a compound fact.
BUC13	Nested Compound Fact	Variation of Compound Fact. Compound fact nested within another compound fact.
BUC14	Reconciliation of Balance	Variation of Roll Up. Reconciliation of a balance with another balance. (Note that this is not a roll forward.)
BUC15	Adjustment	Metapattern. Reconciles an originally stated balance to a restated balance, the adjustment being the total change, between two different report dates such as a prior period adjustment.
BUC16	Variance	Metapattern. Reconciles some reporting scenario with another reporting scenario, the variance between reporting scenarios being the variance or changes such as the variance between actual and budget.
BUC17	Complex Computation	Metapattern. A complex computation information model can be thought of as a hierarchy plus a set of commutations between different concepts within that hierarchy which are challenging to model as the parent/child relations.
BUC24	Text Block	Metapattern. Modelling of what could be modelled as some other information model as one fact. By definition a text block is one fact.
BUC25	Prose	Variation of text block. Information which contains multiple paragraphs, schedules, lists etc. which should appear in a particular order or sequence to be meaningful.
BUC26	Escaped XHTML	Variation of text block. Same as prose or text block. Points out how escaped XHTML can be used to report a fact or set of facts.
BUC27	Using JSON	Variation of text block. Same information contained in the simple compound fact expressed using the JSON syntax.
BUC28	General Comment	A comment or footnote which expands on or provided additional information for some reported fact.
BUC30	Classes	Shows how concepts can be related to other concepts and points out the differences between modelling something as a concept and as the member of an axis.
BUC31	Class Properties	Shows how concepts related to other concepts can be expressed making the use of an [Axis].
BUC32	Grid	A grid information model is a pseudo metapattern which uses the presentation characteristics of the columns and rows of a table to model information. (Not recommended)
BUC34	Pivot Table	A set of facts comprised of a single concept which is characterized by one or more axis. Information set is similar to a pivot table.
BUC35	Grouped Report	Variation of Compound Fact. Table which contains multiple axis which are used to provide information for a complex information set.

#	Title	Description
BUC36	Flow	Shows the notion of flow or ordering/sequencing of different tables within a financial report and how the ordering or sequencing is important and can be achieved.
BUC41	Restatement	Financial reporting use case of a restatement of income resulting from prior period error or change in accounting policy.
BUC42	Reissue Report	Financial reporting use case of the reissuance of a report which has already been issued.
BUC43	Reclassification	Financial reporting use case of the reclassification of prior period line items of a report to conform to current period classifications.
BUC44	Reason Not Reported	A specific type of comment or footnote which explains why a fact has not been reported. Points out that footnotes can be differentiated using roles.
BUC99	Non-Financial Information	Shows that there is no difference between expressing financial and non-financial information.

20.1.1. Business Use Case Documentation

The following is an overview of what is provided for each business use case in the next section which covers each use case in detail.

- **Visual Example**: The visual example provides a common rendering of the information articulated by the use case. This is a rendering is what the business use case might look like on paper.
- **Basic Automated Semantic Rendering**: The automated semantic rendering is a human-readable rendering or presentation of the information provided for this business use case. This automated rendering should be as close to and as readable as the visual example.
- **Report Elements and Model Structure**: The model structure provides an overview visualization of the report elements and the relations between the report elements of the business use case.
- **Description**: The description provides a brief, concise narrative of the business use case and key points which we would like to bring to your attention.
- **Important distinguishing aspects and dynamics**: The important characteristics section provides a summary of the important characteristics and dynamics which you should be focused on when looking at the specific business use case. This section focuses on and points out subtle, intimate details of the business use case and how it is different from other use cases.

The documentation in this section is not intended to provide all the details of each business use case. For the details one must rely on the actual XBRL instance, XBRL taxonomy, and other supporting files. The information above is intended to provide the key information which is helpful in grasping the essential understanding from the documentation which will help you dig into the details within the actual files.

20.1.2. Business Use Case Files and Reports

All the additional details are provided in physical files which can be read in place on the web or downloaded and used locally. The following URL provides a summary of

all business use cases in a number of forms including a readable HTML page, an RSS feed for creating an automated process for reading the files and a ZIP archive for downloading all business use cases. This information can be found here:

http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCases/2013-05-15

This is an explanation of the information for each business use case which can be found by clicking on each use case and following it to the index file for that use case which looks like the following (this shows the *Flat Hierarchy* business use case as an example of each use case):

Business Use Case: Flat Hierarchy

#	Item	Description
A.	Business use case name	**FlatHierarchy**
B.	Description	Metapattern. One level flat hierarchy. No computations.
C.	Visual example	**Sample Company** **For Period Ending December 31,** **(thousands of dollars, except number of employees)**

	2010	2009	2008	2007	2006
Sales, Net	1,500	1,400	1,300	1,200	1,100
Income (Loss) from Continuing Operations	500	400	300	200	100
Net Income (Loss)	51	41	31	21	11
Cash Flow Provided by (used in) Operating Activities, Net	5,000	4,000	3,000	2,000	1,000
Capital Additions	1,000	650	550	450	350
Average Number of Employees	300	290	280	270	260

D.	Visual example file	PDF | JPEG
E.	XBRL taxonomy	XSD
F.	XBRL instance	XBRL
G.	XBRL formulas	XBRL Formulas
H.	Human readable viewer	Coming soon!
I.	ZIP Archieve with All Files	ZIP

This is an explanation of each item on the index page:

A. **Business use case name**: Provides the unique name of the business use case.

B. **Description**: Provides a concise description of the business use case. Also indicates if the use case is a metapattern, a variation of a metapattern, or other useful information.

C. **Visual example**: Provides a JPEG image for the business use case.

D. **Visual example file**: Provides links to PDF and JPEG versions of the visual example of the business use case.

E. **XBRL taxonomy**: Provides a link to the XBRL taxonomy file.

F. **XBRL instance**: Provides a link to the XBRL instance file.

G. **XBRL formulas**: Provides a link to the business rules expressed using XBRL formula for the business use case.

H. **Human readable viewer**: Provides a battery of reports which organize the information above into an easier to read HTML format.

I. **ZIP Archive with all files**: Provides a ZIP archive of all the files above for easy download.

20.1.3. Background Understanding Required

Trying to work with these business use cases without the proper background material would be like trying to learn about algebra or geometry without understanding the notion of what a number is, not understanding how to count, and not understanding the basics of mathematics. There are steps in the learning process and you cannot skip any steps. Another way to say this is that there are no short cuts.

To get the most out of these business use cases it is important to work through certain information as necessary background and foundational material. The following sections are important:

- *Understanding Important Key Terms* as it defines the terminology used throughout the use cases.
- *Overview of Logical Model* as it establishes the logical model used by each business use case.
- *Understanding the Multidimensional Model* as it establishes terminology used by the logical model and logical model report elements.
- *Information Model Metapatterns* is not necessarily required, however this section provides an understanding of the fundamental metapatterns which make up each business use case.
- *Domain Partition Aggregation Models* as this helps understand the relations between the members of a domain of an axis.

Lastly, it is important that the reader understand that there are two important pieces which are not covered by the business use cases. First, each business use case is a small example, consciously created as a standalone unit to make understanding of the use case as easy as possible. However, the different sections of a financial report can be related. These relations are covered in the Comprehensive Example section of this document. Second, there are some special or specific modelling considerations which are not addressed within the business use cases. These are all covered in the section *Special or Specific Modelling Considerations*, rather than complicating the business use cases with these ideas.

20.2. Flat hierarchy

The *Flat Hierarchy* business use case shows how to model information which has no computation type relations but does have some sort of relationship. In this case the hierarchy has only one level, it is flat. The metapattern of this business use case is the **hierarchy**.

20.2.1. Visual Example

Sample Company
For Period Ending December 31,
(thousands of dollars, except number of employees)

	2010	2009	2008	2007	2006
Sales, Net	1,500	1,400	1,300	1,200	1,100
Income (Loss) from Continuing Operations	500	400	300	200	100
Net Income (Loss)	51	41	31	21	11
Cash Flow Provided by (used in) Operating Activities, Net	5,000	4,000	3,000	2,000	1,000
Capital Additions	1,000	650	550	450	350
Average Number of Employees	300	290	280	270	260

20.2.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Financial Highlights (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCases/FlatHierarchy/FinancialHighlights)
Table	Financial Highlights [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Financial Highlights [Line Items]	Period [Axis]				
	2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31	2008-01-01 - 2008-12-31	2007-01-01 - 2007-12-31	2006-01-01 - 2006-12-31
Financial Highlights [Hierarchy]					
Sales, Net	1,500,000	1,400,000	1,300,000	1,200,000	1,100,000
Income (Loss) from Continuing Operations	500,000	400,000	300,000	200,000	100,000
Net Income (Loss)	51,000	41,000	31,000	21,000	11,000
Cash Flow Provided by (Used in) Operating Activities, Net	5,000,000	4,000,000	3,000,000	2,000,000	1,000,000
Capital Additions	1,000,000	650,000	550,000	450,000	350,000
Average Number of Employees	300	290	280	270	260

20.2.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Financial Highlights (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCases/FlatHierarchy/FinancialHighlights)
Table	Financial Highlights [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Financial Highlights [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Financial Highlights [Line Items]**	[Line Items]		
5	*Financial Highlights [Hierarchy]*	[Abstract]		
6	Sales, Net	[Concept] Monetary	For Period	Credit
7	Income (Loss) from Continuing Operations	[Concept] Monetary	For Period	Credit
8	Net Income (Loss)	[Concept] Monetary	For Period	Credit
9	Cash Flow Provided by (Used in) Operating Activities, Net	[Concept] Monetary	For Period	Debit
10	Capital Additions	[Concept] Monetary	For Period	Debit
11	Average Number of Employees	[Concept] Decimal	For Period	

20.2.4. Description

Financial highlights reported by an organization are a good example of a flat hierarchy. The key idea here is to show that pieces of information have relationships, but those relationships can be quite basic in nature. In this case some set of numbers is articulated as a flat list of facts which make up the financial highlights an entity desires to disclose.

20.2.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- This use case reports six facts for five periods, a total of 30 pieces of information or facts.
- This use case shows all numeric information, although there are two types of numeric information: monetary and pure values.
- The concepts are for the most part unrelated, coming from different parts of a financial statement. By unrelated we mean no numeric relationship or computation and no deeper hierarchy, the information is simply one flat list of facts which are reported.
- The facts reported all relate to the consolidated entity, this is made explicit by the "Legal Entity [Axis]" which has a value of "Consolidated Entity [Member]" for each fact reported.
- The "Financial Highlights [Table]" pulls the one [Axis] and the six concepts which make up the [Line Items] together.
- Note that while not present on the [Table], the "Reporting Entity [Axis]" (i.e. Sample Company) and "Period [Axis]" (the five years shown) do in fact exist; they are required by the XBRL technical syntax.

20.3. Nested hierarchy

The *Nested Hierarchy* business use case is a variation of a hierarchy. It adds to the flat hierarchy in that it adds an additional layer of nesting or another level to the hierarchy. As you look at the visual example, think about how it looks similar to the outline view of a Microsoft Word document. The metapattern of this business use case is the **hierarchy**.

20.3.1. Visual Example

Sample Company
December 31, 2010

Accounting Policies

The financial statements have been prepared on the historical cost basis, except for the revaluation of land and buildings and certain financial instruments. The principal accounting policies adopted are set out below.

Inventories
Inventories are stated at the lower of cost and net realisable value. Cost comprises direct materials and, where applicable, direct labour costs and those overheads that have been incurred in bringing the inventories to their present location and condition. Cost is calculated using the weighted average method. Net realisable value represents the estimated selling price less all estimated costs to completion and costs to be incurred in marketing, selling and distribution. Inventories are comprised of raw materials and work in progress.

Financial Instruments
Financial assets and liabilities are recognised on the Group's balance sheet when the Group has become a party to the contractual provisions of the investment.

Trade receivables
Trade receivables are stated at their nominal value as reduced by appropriate allowances for estimated irrecoverable amounts.

Investments in securities
Investments in securities are recognised on a trade-date basis and are initially measured at cost.

Bank borrowings
Interest-bearing bank loans and overdrafts are recorded at the proceeds received, net of direct issue costs. Finance charges, including premiums payable on settlement or redemption, are accounted for on an accrual basis and are added to the carrying amount of the instrument to the extent that they are not settled in the period in which they arise.

Provisions
Provisions are recognised when the Group has a present obligation as a result of a past event which it is probable will result in an outflow of economic benefits that can be reasonably estimated.

20.3.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Accounting Policies (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/NestedHierarchy/AccountingPolicies)
Table	Accounting Policies [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Accounting Policies [Line Items]	Period [Axis]
	2010-01-01 - 2010-12-31
Accounting Policies [Hierarchy]	
Basis of Presentation [Text Block]	The financial statements have been prepared on the historical cost basis, except for the revaluation of land and buildings and certain financial instruments. The principal accounting policies adopted are set out below.
Basis of Presentation	Historical Cost
Inventory Policy [Text Block]	Inventories are stated at the lower of cost and net realisable value. Cost comprises direct materials and, where applicable, direct labour costs and those overheads that have been incurred in bringing the inventories to their present location and condition. Cost is calculated using the weighted average method. Net realisable value represents the estimated selling price less all estimated costs to completion and costs to be incurred in marketing, selling and distribution. Inventories are comprised of raw materials and work in progress.
Inventory Valuation Method	Cost
Description of Inventory Components	weighted average method
Inventory Cost Method	FIFO
Description of Net Realizable Value	This is the description of the net realizable value.
Financial Instruments Policy [Text Block]	Financial assets and liabilities are recognised on the Group's balance sheet when the Group has become a party to the contractual provisions of the investment.
Trade Receivables Policy	Trade receivables are stated at their nominal value as reduced by appropriate allowances for estimated irrecoverable amounts.
Investments in Securities Policy	Investments in securities are recognised on a trade-date basis and are initially measured at cost.
Bank Borrowings Policy	Interest-bearing bank loans and overdrafts are recorded at the proceeds received, net of direct issue costs. Finance charges, including premiums payable on settlement or redemption, are accounted for on an accrual basis and are added to the carrying amount of the instrument to the extent that they are not settled in the period in which they arise.
Provisions Policy	Provisions are recognised when the Group has a present obligation as a result of a past event which it is probable will result in an outflow of economic benefits that can be reasonably estimated.

20.3.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Accounting Policies (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/NestedHierarchy/AccountingPolicies)
Table	Accounting Policies [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Accounting Policies [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Accounting Policies [Line Items]**	[Line Items]		
5	*Accounting Policies [Hierarchy]*	[Abstract]		
6	Basis of Presentation [Text Block]	[Concept] String	For Period	
7	Basis of Presentation	[Concept] String	For Period	
8	Inventory Policy [Text Block]	[Concept] String	For Period	
9	Inventory Valuation Method	[Concept] String	For Period	
10	Description of Inventory Components	[Concept] String	For Period	
11	Inventory Cost Method	[Concept] String	For Period	
12	Description of Net Realizable Value	[Concept] String	For Period	
13	Financial Instruments Policy [Text Block]	[Concept] String	For Period	
14	Trade Receivables Policy	[Concept] String	For Period	
15	Investments in Securities Policy	[Concept] String	For Period	
16	Bank Borrowings Policy	[Concept] String	For Period	
17	Provisions Policy	[Concept] String	For Period	

20.3.4. Description

The *Nested Hierarchy* builds on the *Flat Hierarchy* business use case, introducing the notion that a hierarchy can have one or more sub-hierarchies. There is no way to differentiate the sub-hierarchies into any sort of category or meaning. Another way to say this is that the nesting really has no formal meaning. Many times meaning of the nesting is erroneously implied by model creators or model users.

20.3.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- The *Flat Hierarchy* shows a flat hierarchy which contains all numbers. In contrast, *Nested Hierarchy* business use case shows a nested hierarchy of text. There is really very little difference between these two use cases other than the number of nesting levels.
- A hierarchy can be created to any depth, having any number of levels. There are pros and cons to adding or not adding levels.
- When modelling a hierarchy, ask yourself "Why am I making this a child of this concept rather than a sibling?" Some reason to make a concept a child or a sibling of another concept should exist.

20.4. Simple roll up

The *Simple Roll Up* business use case shows how to model what is commonly referred to as a roll up. A roll up is simply two or more concepts which add up to a third concept: Concept A + Concept B + "*n* concept"= Total concept. The metapattern of this business use case is the **roll up**.

20.4.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	2010	2009
ASSETS		
Property, Plant, and Equipment, Net		
Land	5,347	1,147
Buildings, Net	244,508	366,375
Furniture and Fixtures, Net	34,457	34,457
Computer Equipment, Net	4,169	5,313
Other Property, Plant, and Equipment, Net	6,702	6,149
Property, Plant and Equipment, Net, Total	295,183	413,441

20.4.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Property, Plant, and Equipment, by Component (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/SimpleRollUp/PropertyPlantAndEquipmentByComponent)
Table	Property, Plant and Equipment, by Component [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Property, Plant and Equipment, by Component [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Property, Plant and Equipment, Net [Roll Up]		
Land	5,347,000	1,147,000
Buildings, Net	244,508,000	366,375,000
Furniture and Fixtures, Net	34,457,000	34,457,000
Computer Equipment, Net	4,169,000	5,313,000
Other Property, Plant and Equipment, Net	6,702,000	6,149,000
Property, Plant and Equipment, Net, Total	295,183,000	413,441,000

20.4.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Property, Plant, and Equipment, by Component (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/SimpleRollUp/PropertyPlantAndEquipmentByCom
Table	Property, Plant and Equipment, by Component [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Property, Plant and Equipment, by Component [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Property, Plant and Equipment, by Component [Line Items]**	[Line Items]		
5	*Property, Plant and Equipment, Net [Roll Up]*	[Abstract]		
6	Land	[Concept] Monetary	As Of	Debit
7	Buildings, Net	[Concept] Monetary	As Of	Debit
8	Furniture and Fixtures, Net	[Concept] Monetary	As Of	Debit
9	Computer Equipment, Net	[Concept] Monetary	As Of	Debit
10	Other Property, Plant and Equipment, Net	[Concept] Monetary	As Of	Debit
11	Property, Plant and Equipment, Net, Total	[Concept] Monetary	As Of	Debit

20.4.4. Description

The *Roll Up* business use case introduces the notion of numeric relations between concepts. In the case of a *Roll Up* computation, several concepts add up to some total concept. Basically, a *Roll Up* builds on a *Hierarchy* in that it adds the business rules of the computation to the hierarchy of concepts. Roll ups can be expressed using XBRL calculations.

20.4.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- A Roll Up articulates the relations: A + B + *n* = Total, where *n* means any number of concepts.
- A Roll Up may have only one total concept.
- The relation may be + or – (plus or minus).
- Notice that all of the concepts in this *Roll Up* business use case have a balance type of DEBIT.
- The business rules for a roll up can also be expressed using XBRL formula. One advantage of using XBRL formula is that a tolerance can be added to the computation.

20.5. Nested roll up

The *Nested Roll Up* business use case is a variation of the *Roll Up* business use case where one or more additional roll ups are contained within another roll up, effectively nesting roll ups. The metapattern of this business use case is the **roll up**.

20.5.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	As of December 31,	
	2010	**2009**
CURRENT		
Foreign	200	250
Domestic	50	250
Current	250	500
DEFERRED		
Foreign	200	250
Domestic	50	250
Deferred	250	500
Income Tax Expense (Benefit)	500	1,000

20.5.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Income Tax Expense (Benefit) (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/NestedRollUp/IncomeTaxExpenseBenefit)
Table	Income Tax Expense (Benefit), by Component [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Income Tax Expense (Benefit) [Line Items]	Period [Axis]	
	2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31
Income Tax Expense (Benefit) [Roll Up]		
Income Tax Expense (Benefit), Current [Roll Up]		
Income Tax Expense (Benefit), Current, Foreign	200,000	250,000
Income Tax Expense (Benefit), Current, Domestic	50,000	250,000
Income Tax Expense (Benefit), Current	250,000	500,000
Income Tax Expense (Benefit), Deferred [Roll Up]		
Income Tax Expense (Benefit), Deferred, Foreign	200,000	250,000
Income Tax Expense (Benefit), Deferred, Domestic	50,000	250,000
Income Tax Expense (Benefit), Deferred	250,000	500,000
Income Tax Expense (Benefit), Total	500,000	1,000,000

20.5.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Income Tax Expense (Benefit) (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/NestedRollUp/IncomeTaxExpenseBenefit)
Table	Income Tax Expense (Benefit), by Component [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Income Tax Expense (Benefit), by Component [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Income Tax Expense (Benefit) [Line Items]**	[Line Items]		
5	*Income Tax Expense (Benefit) [Roll Up]*	[Abstract]		
6	*Income Tax Expense (Benefit), Current [Roll Up]*	[Abstract]		
7	Income Tax Expense (Benefit), Current, Foreign	[Concept] Monetary	For Period	Debit
8	Income Tax Expense (Benefit), Current, Domestic	[Concept] Monetary	For Period	Debit
9	Income Tax Expense (Benefit), Current	[Concept] Monetary	For Period	Debit
10	*Income Tax Expense (Benefit), Deferred [Roll Up]*	[Abstract]		
11	Income Tax Expense (Benefit), Deferred, Foreign	[Concept] Monetary	For Period	Debit
12	Income Tax Expense (Benefit), Deferred, Domestic	[Concept] Monetary	For Period	Debit
13	Income Tax Expense (Benefit), Deferred	[Concept] Monetary	For Period	Debit
14	Income Tax Expense (Benefit), Total	[Concept] Monetary	For Period	Debit

20.5.4. Description

A *Nested Roll Up* builds on the *Roll Up* showing that a Roll Up may contain other *Roll Ups*. Nested roll ups can be looked at as basically sub totals. In this example, the grand total Income Tax Expense (Benefit) is broken down by the sub totals Current and Deferred. Each of those sub totals is broken down by its Foreign and Domestic components.

Alternatively, the sub totals could have been Foreign and Domestic with those sub totals then broken down by their Current and Deferred components. Or, both of these breakdowns could have been provided, see the *Multiple Roll Ups* use case.

20.5.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- A *Roll Up* can have another *Roll Up* nested within it.
- Any depth of nesting is allowed.
- Alternatively, the subtotal could have been foreign/domestic and the breakdown current/deferred; however, a choice was made here to provide only this subtotalling. Another alternative would be to provide both approaches to totalling the information.

20.6. Inverted roll up

The *Inverted Roll Up* business use case points out that roll ups can appear to be inverted. This business use case is really no different than a Roll Up other than it has a number of nested roll ups creating what amounts to a very deep nesting. The metapattern of this business use case is the **roll up**.

20.6.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	For Year Ended December 31,	
	2010	**2009**
Revenues, Gross	1,000	2,000
Returns and Allowances	-1,000	-2,000
Revenues, Net	0	0
Cost of Sales	-1,000	-2,000
Gross Profit (Loss)	-1,000	-2,000
Other Operating Expenses	-1,000	-2,000
Other Operating Income	1,000	2,000
Operating Income (Loss)	-1,000	-2,000
Nonoperating Expenses (Income)	1,000	2,000
Income (Loss) from Continuing Operations Before Income Taxes	0	0
Income Tax Expense (Benefit)	1,000	2,000
Net Income (Loss)	-1,000	-2,000

20.6.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Income Statement (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/InvertedRollUp/IncomeStatement)
Table	Income Statement [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Income Statement [Line Items]	Period [Axis]	
	2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31
Net Income (Loss) [Roll Up]		
Income (Loss) from Continuing Operations Before Income Taxes [Roll Up]		
Operating Income (Loss) [Roll Up]		
Gross Profit (Loss) [Roll Up]		
Revenues, Net [Roll Up]		
Revenues, Gross	1,000,000	2,000,000
Returns and Allowances	(1,000,000)	(2,000,000)
Revenues, Net	0	0
Cost of Sales	1,000,000	2,000,000
Gross Profit (Loss)	(1,000,000)	(2,000,000)
Other Operating Income	1,000,000	2,000,000
Other Operating Expenses	(1,000,000)	(2,000,000)
Operating Income (Loss)	(1,000,000)	(2,000,000)
Nonoperating Income (Loss)	1,000,000	2,000,000
Income (Loss) from Continuing Operations Before Income Taxes	0	0
Income Tax Expense (Benefit)	1,000,000	2,000,000
Net Income (Loss)	(1,000,000)	(2,000,000)

20.6.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Income Statement (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/InvertedRollUp/IncomeStatement)
Table	Income Statement [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Income Statement [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Income Statement [Line Items]**	[Line Items]		
5	*Net Income (Loss) [Roll Up]*	[Abstract]		
6	*Income (Loss) from Continuing Operations Before Income Taxes [Roll Up]*	[Abstract]		
7	*Operating Income (Loss) [Roll Up]*	[Abstract]		
8	*Gross Profit (Loss) [Roll Up]*	[Abstract]		
9	*Revenues, Net [Roll Up]*	[Abstract]		
10	Revenues, Gross	[Concept] Monetary	For Period	Credit
11	Returns and Allowances	[Concept] Monetary	For Period	Debit
12	Revenues, Net	[Concept] Monetary	For Period	Credit
13	Cost of Sales	[Concept] Monetary	For Period	Debit
14	Gross Profit (Loss)	[Concept] Monetary	For Period	Credit
15	Other Operating Income	[Concept] Monetary	For Period	Credit
16	Other Operating Expenses	[Concept] Monetary	For Period	Debit
17	Operating Income (Loss)	[Concept] Monetary	For Period	Credit
18	Nonoperating Income (Loss)	[Concept] Monetary	For Period	Credit
19	Income (Loss) from Continuing Operations Before Income Taxes	[Concept] Monetary	For Period	Credit
20	Income Tax Expense (Benefit)	[Concept] Monetary	For Period	Debit
21	Net Income (Loss)	[Concept] Monetary	For Period	Credit

20.6.4. Description

An *Inverted Roll Up* again builds on the *Roll Up* and *Nested Roll U*p showing what amounts to a more complex nesting which makes the *Roll Up* look inverted, or up-side-down.

The presentation of the information articulated within a Roll Up is dependent on the software application which is generating the presentation. There is nothing in XBRL which says Roll Ups need to be presented up-side-down. However, many software interfaces do work this way.

20.6.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- There is no real difference between a *Roll Up*, a *Nested Roll Up*, and an *Inverted Roll Up* other than the number of nesting levels.
- Notice in this use case that the concepts are both debits and credits. The weight in the XBRL calculations determines whether the relation is additive or subtractive in nature.
- There is a relation between the balance type of a concept and the weight which is used when expressing an XBRL calculation. There is no relation between the balance type and the presentation of the concept as positive or negative. Many business professionals get confused by this and believe that there is a relation.

- Software interfaces are free to present information as positive or negative. Automated processes need clarity about the polarity of numeric values relative to other numeric values.
- Numeric concepts which do not have a balance type must have the polarity of the concept defined within the concept's documentation to make the polarity clear.
- Creators of a taxonomy can use different preferred label roles to help indicate how a software application should render the information, helping to make the choice to show either a positive or negative value.

20.7. Multiple roll ups

The *Multiple Roll Ups* business use case is a variation of a Roll Up where one concept is the total concept of two or more unique Roll Ups. Basically because the one total concept aggregates in more than one way, then multiple networks must be used to separate the roll ups. The metapattern of this business use case is the **roll up**.

20.7.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	2010	2009
TRADE AND OTHER RECEIVABLES		
Trade and Other Receivables, Net, by Component		
Trade Receivables, Net	8,790	6,431
Financing Lease Receivables, Net	2,498	1,263
Other Receivables, Net	1,305	1,096
Trade and Other Receivables, Net	12,593	8,790
Trade and Other Receivables, Net, by Net/Gross		
Trade and Other Receivables, Gross	18,280	13,472
Allowance for Doubtfull Accounts	-5,687	-4,682
Trade and Other Receivables, Net	12,593	8,790
Trade and Other Receivables, Net, by Current/Noncurrent		
Trade Receivables, Net, Current	6,340	5,701
Trade Receivables, Net, Noncurrent	6,253	3,089
Trade and Other Receivables, Net	12,593	8,790

20.7.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Trade and Other Receivables, Net, by Current/Noncurrent (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/MultipleRollUps/ByCurrentNoncurrent)
Table	Trade and Other Receivables, Net, by Current/Noncurrent [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

	Period [Axis]	
Trade and Other Receivables, Net, by Current/Noncurrent [Line Items]	2010-12-31	2009-12-31
Trade and Other Receivables, Net, by Current/Noncurrent [Roll Up]		
Trade and Other Receivables, Net, Current	6,340,000	5,701,000
Trade and Other Receivables, Net, Noncurrent	6,253,000	3,089,000
Trade and Other Receivables, Net	12,593,000	8,790,000

Component: (Network and Table)	
Network	Trade and Other Receivables, Net, by Net/Gross (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/MultipleRollUps/ByNetGross)
Table	Trade and Other Receivables, Net, by Net/Gross [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Trade and Other Receivables, Net, by Net/Gross [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Trade and Other Receivables, Net, by Net/Gross [Roll Up]		
Trade and Other Receivables, Gross	18,280,000	13,472,000
Allowance for Doubtfull Accounts	5,687,000	4,682,000
Trade and Other Receivables, Net	12,593,000	8,790,000

Component: (Network and Table)	
Network	Trade and Other Receivables, Net, by Component (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/MultipleRollUps/ByComponent)
Table	Trade and Other Receivables, Net, by Component [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Trade and Other Receivables, Net, by Component [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Trade and Other Receivables, Net [Roll Up]		
Trade Receivables, Net	8,790,000	6,431,000
Financing Lease Receivables, Net	2,498,000	1,263,000
Other Receivables, Net	1,305,000	1,096,000
Trade and Other Receivables, Net	12,593,000	8,790,000

20.7.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Trade and Other Receivables, Net, by Current/Noncurrent (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/MultipleRollUps/ByCurrentNoncurrent)
Table	Trade and Other Receivables, Net, by Current/Noncurrent [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Trade and Other Receivables, Net, by Current/Noncurrent [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Trade and Other Receivables, Net, by Current/Noncurrent [Line Items]**	[Line Items]		
5	*Trade and Other Receivables, Net, by Current/Noncurrent [Roll Up]*	[Abstract]		
6	Trade and Other Receivables, Net, Current	[Concept] Monetary	As Of	Debit
7	Trade and Other Receivables, Net, Noncurrent	[Concept] Monetary	As Of	Debit
8	Trade and Other Receivables, Net	[Concept] Monetary	As Of	Debit

Component: (Network and Table)	
Network	Trade and Other Receivables, Net, by Net/Gross (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/MultipleRollUps/ByNetGross)
Table	Trade and Other Receivables, Net, by Net/Gross [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Trade and Other Receivables, Net, by Net/Gross [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Trade and Other Receivables, Net, by Net/Gross [Line Items]**	[Line Items]		
5	*Trade and Other Receivables, Net, by Net/Gross [Roll Up]*	[Abstract]		
6	Trade and Other Receivables, Gross	[Concept] Monetary	As Of	Debit
7	Allowance for Doubtfull Accounts	[Concept] Monetary	As Of	Credit
8	Trade and Other Receivables, Net	[Concept] Monetary	As Of	Debit

Component: (Network and Table)	
Network	Trade and Other Receivables, Net, by Component (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/MultipleRollUps/ByComponent)
Table	Trade and Other Receivables, Net, by Component [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Trade and Other Receivables, Net, by Component [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Trade and Other Receivables, Net, by Component [Line Items]**	[Line Items]		
5	*Trade and Other Receivables, Net [Roll Up]*	[Abstract]		
6	Trade Receivables, Net	[Concept] Monetary	As Of	Debit
7	Financing Lease Receivables, Net	[Concept] Monetary	As Of	Debit
8	Other Receivables, Net	[Concept] Monetary	As Of	Debit
9	Trade and Other Receivables, Net	[Concept] Monetary	As Of	Debit

20.7.4. Description

The *Multiple Roll Ups* business use case points out that a concept might have any number of ways to break down a total concept. To avoid conflicts, these different computations must be separated into different networks.

Networks can be thought of in the same way that broadcast networks send signals using different frequencies in order to separate the different television channels so the signals do not conflict. In this example, Trade and Other Receivables, Net is aggregated in three different ways: by component, by net/gross, and by current/noncurrent.

20.7.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- Different aggregations of the same number need to be put into separate and distinct networks in order to avoid modelling conflicts.
- Be sure to keep the presentation, calculation, and definition networks synchronized in order to be clear as to which set of aggregations go with which set of breakdowns (i.e. presentation, calculation, definition for each set should be the same network role).

20.8. Simple roll forward

The *Simple Roll Forward* business use case shows how to model a very common information model found in financial reporting: the roll forward or sometimes called a movement analysis. A roll forward reconciles an ending balance with a beginning balance via one or more changes in the balance. The business rule equation for a roll forward is: beginning balance + changes to the balance = ending balance. The metapattern of this business use case is the **roll forward** and the **roll up**.

20.8.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	2010	2009
Roll Forward of Land		
Land, Beginning Balance	1,147	1,147
Additions	1,992	400
Disposals	-193	-200
Translation difference	2,401	-200
Land, Ending Balance	5,347	1,147

20.8.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Roll Forward of Land (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/SimpleRollForward/RollForwardOfLand)
Table	Land Changes [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Land Changes [Line Items]	Period [Axis]	
	2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31
Roll Forward of Land [Roll Forward]		
Land, Beginning Balance	1,147,000	1,147,000
Land, Period Increase (Decrease), Total [Roll Up]		
Land, Additions	1,992,000	400,000
Land, Disposals	(193,000)	(200,000)
Land, Translation Difference	2,401,000	(200,000)
Land, Period Increase (Decrease), Total	4,200,000	0
Land, Ending Balance	5,347,000	1,147,000

20.8.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Roll Forward of Land (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/SimpleRollForward/RollForwardOfLand)
Table	Land Changes [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Land Changes [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Land Changes [Line Items]**	[Line Items]		
5	*Roll Forward of Land [Roll Forward]*	[Abstract]		
6	Land, Beginning Balance	[Concept] Monetary	As Of	Debit
7	*Land, Period Increase (Decrease), Total [Roll Up]*	[Abstract]		
8	Land, Additions	[Concept] Monetary	For Period	Debit
9	Land, Disposals	[Concept] Monetary	For Period	Credit
10	Land, Translation Difference	[Concept] Monetary	For Period	Debit
11	Land, Period Increase (Decrease), Total	[Concept] Monetary	For Period	Debit
12	Land, Ending Balance	[Concept] Monetary	As Of	Debit

20.8.4. Description

The *Simple Roll Forward* introduces a different type of computation, different from the *Roll Up*. A *Roll Forward* is a reconciliation of a balance between two different points in time (i.e. *Period [Axis]*). The equation of a roll forward is: Beginning balance + Changes = Ending Balance. The beginning and ending balance is always the same concept at two different points in time, period is different for the two balances. The changes relate to the period between the two balances. The data types of all concepts involved in a roll forward are the same.

A roll forward can contain only one change represented by a total concept. That total could be represented by a roll up which breaks down the details of the changes. In this business use case there is one change concept and the details of the changes aggregate to that total using a roll up. The changes is detailed to be Additions, Disposals, and Translation Difference within the roll up of changes. Alternatively, this could have been modelled without the total and Additions, Disposals and Translation Difference would each be changes between the beginning and ending balance. Semantically, the two approaches are equivalent.

20.8.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- A *Roll Forward* always reconciles a concept balance between two different points in time. The balance is always an instant, the changes are always durations or for some period of time.
- A *Roll Forward* computation cannot be expressed using XBRL calculations because all XBRL calculations must be within the exact same context. The balance concept is at two different points in time, therefore two different contexts. Further, the changes are in a third context.
- XBRL Formulas can be used to create a business rule to validate a *Roll Forward* computation.
- There are two approaches to showing the polarity of the numbers for the changes of a roll forward. One approach is for the rendering engine to

leverage the balance attribute value to determine if it should be shown as a positive or negative. A second approach, required if the concepts have no balance attribute, is to use a negated label role to indicate that the sign of a presented change should be flipped.

20.9. Complex roll forward

The *Complex Roll Forward* business use case shows how to model what amounts to several *Roll Forwards* combined into one set of information. The metapattern of this business use case is the **roll forward** and the **roll up**.

20.9.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	Land	Buildings, Net	Furniture and Fixtures, Net	Other Property, Plant, and Equipment, Net	Property, Plant, and Equipment, Net
Balance at December 31, 2008	1,000	1,000	1,000	1,000	4,000
Additions	1,000	1,000	1,000	1,000	4,000
Disposals	-1,000	-1,000	-1,000	-1,000	-4,000
Translation Difference	0	0	0	0	0
Other Increase (Decrease)	0	0	0	0	0
Balance at December 31, 2009	1,000	1,000	1,000	1,000	4,000
Additions	1,000	1,000	1,000	1,000	4,000
Disposals	-1,000	-1,000	-1,000	-1,000	-4,000
Translation Difference	0	0	0	0	0
Other Increase (Decrease)	0	0	0	0	0
Balance at December 31, 2010	1,000	1,000	1,000	1,000	4,000

20.9.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Property, Plant, and Equipment, Net (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ComplexRollForward/PropertyPla
Table	Components of Property, Plant and Equipment, Net [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Components of Property, Plant and Equipment, Net [Line Items]	Period [Axis]		
	2010-12-31	2009-12-31	2008-12-31
Property, Plant and Equipment, Net [Roll Up]			
Land	1,000	1,000	1,000
Buildings, Net	1,000	1,000	1,000
Furniture and Fixtures, Net	1,000	1,000	1,000
Other Property, Plant and Equipment, Net	1,000	1,000	1,000
Property, Plant and Equipment, Net	4,000	4,000	4,000

Component: (Network and Table)	
Network	Movement in Property, Plant and Equipment, Net (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ComplexRollForw
Table	Movement in Property, Plant and Equipment, Net [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.
Legal Entity [Axis]	Consolidated Entity [Member]

Movement in Property, Plant and Equipment, Net [Line Items]	Period [Axis]	
	2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31
Movement in Land [Roll Forward]		
Land, Beginning Balance	1,000	1,000
Land, Period Increase (Decrease) [Roll Up]		
Land, Additions	1,000	1,000
Land, Disposals	(1,000)	(1,000)
Land, Translation Difference	0	0
Land, Other Increase (Decrease)	0	0
Land, Period Increase (Decrease)	0	0
Land, Ending Balance	1,000	1,000
Movement in Buildings, Net [Roll Forward]		
Buildings, Net, Beginning Balance	1,000	1,000
Buildings, Net, Period Increase (Decrease) [Roll Up]		
Buildings, Net, Additions	1,000	1,000
Buildings, Net, Disposals	(1,000)	(1,000)
Buildings, Net, Translation Difference	0	0
Buildings, Net, Other Increase (Decrease)	0	0
Buildings, Net, Period Increase (Decrease)	0	0
Buildings, Net, Ending Balance	1,000	1,000

Movement in Furniture and Fixtures, Net [Roll Forward]		
Furniture and Fixtures, Net, Beginning Balance	1,000	1,000
Furniture and Fixtures, Net, Period Increase (Decrease) [Roll Up]		
Furniture and Fixtures, Net, Additions	1,000	1,000
Furniture and Fixtures, Net, Disposals	(1,000)	(1,000)
Furniture and Fixtures, Net, Translation Difference	0	0
Furniture and Fixtures, Net, Other Increase (Decrease)	0	0
Furniture and Fixtures, Net, Period Increase (Decrease)	0	0
Furniture and Fixtures, Net, Ending Balance	1,000	1,000
Movement in Other Property, Plant and Equipment, Net [Roll Forward]		
Other Property, Plant and Equipment, Net, Beginning Balance	1,000	1,000
Other Property, Plant and Equipment, Net, Period Increase (Decrease) [Roll Up]		
Other Property, Plant and Equipment, Net, Additions	1,000	1,000
Other Property, Plant and Equipment, Net, Disposals	(1,000)	(1,000)
Other Property, Plant and Equipment, Net, Translation Difference	0	0
Other Property, Plant and Equipment, Net, Other Increase (Decrease)	0	0
Other Property, Plant and Equipment, Net, Period Increase (Decrease)	0	0
Other Property, Plant and Equipment, Net, Ending Balance	1,000	1,000
Movement in Property, Plant and Equipment, Net [Roll Forward]		
Property, Plant and Equipment, Net, Beginning Balance	4,000	4,000
Property, Plant and Equipment, Net, Period Increase (Decrease) [Roll Up]		
Property, Plant and Equipment, Net, Additions	4,000	4,000
Property, Plant and Equipment, Net, Disposals	(4,000)	(4,000)
Property, Plant and Equipment, Net, Translation Difference	0	0
Property, Plant and Equipment, Net, Other Increase (Decrease)	0	0
Property, Plant and Equipment, Net, Period Increase (Decrease)	0	0
Property, Plant and Equipment, Net, Ending Balance	4,000	4,000

Component: (Network and Table)	
Network	Roll Up of Changes in Property, Plant, and Equipment, Net (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ComplexRollForw
Table	Roll Up of Changes in Property, Plant and Equipment, Net [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.
Legal Entity [Axis]	Consolidated Entity [Member]

Roll Up of Changes in Property, Plant and Equipment, Net [Line Items]	Period [Axis]	
	2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31
Property, Plant and Equipment, Net, Period Increase (Decrease) [Roll Up]		
Property, Plant and Equipment, Net, Additions [Roll Up]		
Land, Additions	1,000	1,000
Buildings, Net, Additions	1,000	1,000
Furniture and Fixtures, Net, Additions	1,000	1,000
Other Property, Plant and Equipment, Net, Additions	1,000	1,000
Property, Plant and Equipment, Net, Additions	4,000	4,000
Property, Plant and Equipment, Net, Displosals [Roll Up]		
Land, Disposals	1,000	1,000
Buildings, Net, Disposals	1,000	1,000
Furniture and Fixtures, Net, Disposals	1,000	1,000
Other Property, Plant and Equipment, Net, Disposals	1,000	1,000
Property, Plant and Equipment, Net, Disposals	4,000	4,000
Property, Plant and Equipment, Net, Translation Difference [Roll Up]		
Land, Translation Difference	0	0
Buildings, Net, Translation Difference	0	0
Furniture and Fixtures, Net, Translation Difference	0	0
Other Property, Plant and Equipment, Net, Translation Difference	0	0
Property, Plant and Equipment, Net, Translation Difference	0	0
Property, Plant and Equipment, Net, Other Increase (Decrease) [Roll Up]		
Land, Other Increase (Decrease)	0	0
Buildings, Net, Other Increase (Decrease)	0	0
Furniture and Fixtures, Net, Other Increase (Decrease)	0	0
Other Property, Plant and Equipment, Net, Other Increase (Decrease)	0	0
Property, Plant and Equipment, Net, Other Increase (Decrease)	0	0
Property, Plant and Equipment, Net, Period Increase (Decrease)	0	0

20.9.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Movement in Property, Plant and Equipment, Net (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ComplexRollForward/MovementInPropertyPlantA
Table	Movement in Property, Plant and Equipment, Net [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Movement in Property, Plant and Equipment, Net [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Movement in Property, Plant and Equipment, Net [Line Items]**	[Line Items]		
5	*Movement in Land [Roll Forward]*	[Abstract]		
6	Land, Beginning Balance	[Concept] Monetary	As Of	Debit
7	*Land, Period Increase (Decrease) [Roll Up]*	[Abstract]		
8	Land, Additions	[Concept] Monetary	For Period	Debit
9	Land, Disposals	[Concept] Monetary	For Period	Credit
10	Land, Translation Difference	[Concept] Monetary	For Period	Debit
11	Land, Other Increase (Decrease)	[Concept] Monetary	For Period	Debit
12	Land, Period Increase (Decrease)	[Concept] Monetary	For Period	Debit
13	Land, Ending Balance	[Concept] Monetary	As Of	Debit
14	*Movement in Buildings, Net [Roll Forward]*	[Abstract]		
15	Buildings, Net, Beginning Balance	[Concept] Monetary	As Of	Debit
16	*Buildings, Net, Period Increase (Decrease) [Roll Up]*	[Abstract]		
17	Buildings, Net, Additions	[Concept] Monetary	For Period	Debit
18	Buildings, Net, Disposals	[Concept] Monetary	For Period	Credit
19	Buildings, Net, Translation Difference	[Concept] Monetary	For Period	Debit
20	Buildings, Net, Other Increase (Decrease)	[Concept] Monetary	For Period	Debit
21	Buildings, Net, Period Increase (Decrease)	[Concept] Monetary	For Period	Debit
22	Buildings, Net, Ending Balance	[Concept] Monetary	As Of	Debit
23	*Movement in Furniture and Fixtures, Net [Roll Forward]*	[Abstract]		
24	Furniture and Fixtures, Net, Beginning Balance	[Concept] Monetary	As Of	Debit
25	*Furniture and Fixtures, Net, Period Increase (Decrease) [Roll Up]*	[Abstract]		
26	Furniture and Fixtures, Net, Additions	[Concept] Monetary	For Period	Debit
27	Furniture and Fixtures, Net, Disposals	[Concept] Monetary	For Period	Credit
28	Furniture and Fixtures, Net, Translation Difference	[Concept] Monetary	For Period	Debit
29	Furniture and Fixtures, Net, Other Increase (Decrease)	[Concept] Monetary	For Period	Debit
30	Furniture and Fixtures, Net, Period Increase (Decrease)	[Concept] Monetary	For Period	Debit
31	Furniture and Fixtures, Net, Ending Balance	[Concept] Monetary	As Of	Debit
32	*Movement in Other Property, Plant and Equipment, Net [Roll Forward]*	[Abstract]		
33	Other Property, Plant and Equipment, Net, Beginning Balance	[Concept] Monetary	As Of	Debit
34	*Other Property, Plant and Equipment, Net, Period Increase (Decrease) [Roll Up]*	[Abstract]		
35	Other Property, Plant and Equipment, Net, Additions	[Concept] Monetary	For Period	Debit
36	Other Property, Plant and Equipment, Net, Disposals	[Concept] Monetary	For Period	Credit
37	Other Property, Plant and Equipment, Net, Translation Difference	[Concept] Monetary	For Period	Debit
38	Other Property, Plant and Equipment, Net, Other Increase (Decrease)	[Concept] Monetary	For Period	Debit
39	Other Property, Plant and Equipment, Net, Period Increase (Decrease)	[Concept] Monetary	For Period	Debit
40	Other Property, Plant and Equipment, Net, Ending Balance	[Concept] Monetary	As Of	Debit
41	*Movement in Property, Plant and Equipment, Net [Roll Forward]*	[Abstract]		
42	Property, Plant and Equipment, Net, Beginning Balance	[Concept] Monetary	As Of	Debit
43	*Property, Plant and Equipment, Net, Period Increase (Decrease) [Roll Up]*	[Abstract]		
44	Property, Plant and Equipment, Net, Additions	[Concept] Monetary	For Period	Debit
45	Property, Plant and Equipment, Net, Disposals	[Concept] Monetary	For Period	Credit
46	Property, Plant and Equipment, Net, Translation Difference	[Concept] Monetary	For Period	Debit
47	Property, Plant and Equipment, Net, Other Increase (Decrease)	[Concept] Monetary	For Period	Debit
48	Property, Plant and Equipment, Net, Period Increase (Decrease)	[Concept] Monetary	For Period	Debit
49	Property, Plant and Equipment, Net, Ending Balance	[Concept] Monetary	As Of	Debit

Component: (Network and Table)	
Network	Roll Up of Changes in Property, Plant, and Equipment, Net (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ComplexRollForward/RollUpOfChangesInProperty
Table	Roll Up of Changes in Property, Plant and Equipment, Net [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Roll Up of Changes in Property, Plant and Equipment, Net [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Roll Up of Changes in Property, Plant and Equipment, Net [Line Items]**	[Line Items]		
5	*Property, Plant and Equipment, Net, Period Increase (Decrease) [Roll Up]*	[Abstract]		
6	*Property, Plant and Equipment, Net, Additions [Roll Up]*	[Abstract]		
7	Land, Additions	[Concept] Monetary	For Period	Debit
8	Buildings, Net, Additions	[Concept] Monetary	For Period	Debit
9	Furniture and Fixtures, Net, Additions	[Concept] Monetary	For Period	Debit
10	Other Property, Plant and Equipment, Net, Additions	[Concept] Monetary	For Period	Debit
11	Property, Plant and Equipment, Net, Additions	[Concept] Monetary	For Period	Debit
12	*Property, Plant and Equipment, Net, Displosals [Roll Up]*	[Abstract]		
13	Land, Disposals	[Concept] Monetary	For Period	Credit
14	Buildings, Net, Disposals	[Concept] Monetary	For Period	Credit
15	Furniture and Fixtures, Net, Disposals	[Concept] Monetary	For Period	Credit
16	Other Property, Plant and Equipment, Net, Disposals	[Concept] Monetary	For Period	Credit
17	Property, Plant and Equipment, Net, Disposals	[Concept] Monetary	For Period	Credit
18	*Property, Plant and Equipment, Net, Translation Difference [Roll Up]*	[Abstract]		
19	Land, Translation Difference	[Concept] Monetary	For Period	Debit
20	Buildings, Net, Translation Difference	[Concept] Monetary	For Period	Debit
21	Furniture and Fixtures, Net, Translation Difference	[Concept] Monetary	For Period	Debit
22	Other Property, Plant and Equipment, Net, Translation Difference	[Concept] Monetary	For Period	Debit
23	Property, Plant and Equipment, Net, Translation Difference	[Concept] Monetary	For Period	Debit
24	*Property, Plant and Equipment, Net, Other Increase (Decrease) [Roll Up]*	[Abstract]		
25	Land, Other Increase (Decrease)	[Concept] Monetary	For Period	Debit
26	Buildings, Net, Other Increase (Decrease)	[Concept] Monetary	For Period	Debit
27	Furniture and Fixtures, Net, Other Increase (Decrease)	[Concept] Monetary	For Period	Debit
28	Other Property, Plant and Equipment, Net, Other Increase (Decrease)	[Concept] Monetary	For Period	Debit
29	Property, Plant and Equipment, Net, Other Increase (Decrease)	[Concept] Monetary	For Period	Debit
30	Property, Plant and Equipment, Net, Period Increase (Decrease)	[Concept] Monetary	For Period	Debit

Component: (Network and Table)	
Network	Property, Plant, and Equipment, Net (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ComplexRollForward/PropertyPlantAndEquipment
Table	Components of Property, Plant and Equipment, Net [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Components of Property, Plant and Equipment, Net [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Components of Property, Plant and Equipment, Net [Line Items]**	[Line Items]		
5	*Property, Plant and Equipment, Net [Roll Up]*	[Abstract]		
6	Land	[Concept] Monetary	As Of	Debit
7	Buildings, Net	[Concept] Monetary	As Of	Debit
8	Furniture and Fixtures, Net	[Concept] Monetary	As Of	Debit
9	Other Property, Plant and Equipment, Net	[Concept] Monetary	As Of	Debit
10	Property, Plant and Equipment, Net	[Concept] Monetary	As Of	Debit

20.9.4. Description

The *Complex Roll Forward* builds on the *Simple Roll Forward*, adding multiple *Roll Forwards* which then aggregate to a *Roll Forward* of the total. In the example, *Roll*

Forwards for Land; Buildings, Net; Furniture and Fixtures, Net; Other Property, Plant and Equipment, Net aggregate to the *Roll Forward* of the total Property, Plant and Equipment.

Essentially, the *Complex Roll Forward* can be decomposed into three distinct components: a roll up of the components of property, plant and equipment; a roll up of all the changes in property, plant and equipment; and finally a roll forward for each component of property, plant and equipment.

Note the roll ups, expressed as XBRL calculations, which tie the individual roll forwards to the total roll forward.

20.9.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- The *Roll Ups* for the changes can be expressed and validated using XBRL calculations.
- The *Roll Up* of each balance concept for individual classes of Property, Plant and Equipment to the total for Property, Plant and Equipment, Net can likewise be expressed using XBRL calculations. For example: Land + Buildings, Net + Furniture and Fixtures, Net + Other Property, Plant and Equipment, Net = Property, Plant and Equipment, Net for 2008, 2009, and 2010.
- The *Roll Up* of each change can also be expressed. For example, Additions for each class of Property, Plant and Equipment aggregates to the concept for all categories of Property, Plant and Equipment, Net, Additions. This relation can be seen horizontally in the example.
- A business rule expressed using XBRL Formula is used to make sure the roll forward properly reconciles: beginning balance + total changes = ending balance for each class of PPE and for total PPE.
- Note that the classes of Property, Plant and Equipment could have been presented in the rows and the different balances and changes expressed in the columns. Transposing the information in this way does not change the semantics of the information, it is purely the preference of the consumer of the information. Changing the rows and columns would not change how the information is modelled.
- Note that if each class of PPE were modelled as a [Member] the total number of concepts within the model would be significantly reduced.

20.10. Simple compound fact

The *Simple Compound Fact* business use case shows how to model what amounts set of information which must go together to make any sense. An axis holds the set together, creating in essence a compound fact. The metapattern of this business use case is the **compound fact** and the **hierarchy**.

20.10.1. Visual Example

Sample Company
For Period Ending December 31, 2010

Director	Salary	Bonus	Director Fee	Options Granted, at Fair Value
pattern:JohnDoeMember	1,000	1,000	1,000	1,000
pattern:JaneDoeMember	1,000	1,000	1,000	1,000
frm:DirectorsAllMember	2,000	2,000	2,000	2,000

20.10.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Director Compensation (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/SimpleCompoundFact/DirectorCompensation)
Table	Director Compensation [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Period [Axis]	2010-01-01 - 2010-12-31
Legal Entity [Axis]	Consolidated Entity [Member]

Director Compensation [Line Items]	Director [Axis]		
	John Doe [Member]	Jane Doe [Member]	Directors, All [Member]
Director [Hierarchy]			
Director, Salary	1,000	1,000	2,000
Director, Bonuses	1,000	1,000	2,000
Director, Fees	1,000	1,000	2,000
Director, Options Granted, at Fair Value	1,000	1,000	2,000

20.10.3. Model structure

Component: (Network and Table)	
Network	Director Compensation (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/SimpleCompoundFact/DirectorCompensation)
Table	Director Compensation [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Director Compensation [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Director [Axis]**	[Axis]		
5	Directors, All [Member]	[Member]		
6	John Doe [Member]	[Member]		
7	Jane Doe [Member]	[Member]		
8	**Director Compensation [Line Items]**	[Line Items]		
9	*Director [Hierarchy]*	[Abstract]		
10	Director, Salary	[Concept] Monetary	For Period	Credit
11	Director, Bonuses	[Concept] Monetary	For Period	Credit
12	Director, Fees	[Concept] Monetary	For Period	Credit
13	Director, Options Granted, at Fair Value	[Concept] Monetary	For Period	Credit

20.10.4. Description

The *Simple Compound Fact* business use case shows the notion of a compound fact. A compound fact is a set of facts which must go together to make sense. A compound fact always has an axis which differentiates one set of facts from another. It could be that multiple axis create a composite set of axis which uniquely identifies the compound fact, see the *Grouped Report* business use case.

In this example, the *Director [Axis]* is used to distinguish one director from the other and each director from the total for all directors. The Salary; Bonus; Director Fee; and Options Granted, at Fair Value are provided for each director and for the total for all directors.

20.10.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- A compound fact always has at least one explicit axis (beyond the reporting entity and period) which uniquely identifies each set of facts.
- A compound fact is like the row of a data base table. The axis for the compound fact is like the key for the table containing the rows of the compound fact. If more than one axis is provided, that is like a composite key for the table.
- This Simple Compound Fact business use case introduces the notion of a domain partition and a domain partition aggregation model. The computation of the total Salary, as an example, for all directors is NOT a roll up as each director and the total of all directors are different XBRL contexts and therefore XBRL calculations cannot be utilized to express this computation. XBRL Formulas must be used to express the business rule for the aggregation of information across the Director [Axis]. The facts for add directors may, or may not, tie to another table within the financial report. In this case, there are no other tables.

20.11. Repeating fact

The *Repeating Fact* business use case is a variation of the compound fact metapattern which points out that even only one fact can repeat. The metapattern of this business use case is the **compound fact** and the **hierarchy**.

20.11.1. Visual Example

Sample Company
For Period Ending December 31, 2010

SUBSEQUENT EVENTS

The following is a summary of events subsequent to the balance sheet date:

Description of subsequent event number 1 which relates to the loss of an uncollectable receivable and occurred on January 16, 2011.

Description of subsequent event number 2 which relates to the purchase of a business and occurred on February 1, 2011.

20.11.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Subsequent Events (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/RepeatingFact/SubsequentEvents)
Table	Subsequent Events [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Period [Axis]	2010-01-01 - 2010-12-31
Legal Entity [Axis]	Consolidated Entity [Member]

Subsequent Event [Line Items]	Subsequent Event [Axis]	
	Uncollected Receivable [Member]	Purchase of Business [Member]
Subsequent Event [Hierarchy]		
Subsequent Event, Description	Description of subsequent event number 1 which relates to the loss of an uncollectable receivable and occurred on January 16, 2011.	Description of subsequent event number 2 which relates to the purchase of a business and occurred on February 1, 2011.

20.11.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Subsequent Events (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/RepeatingFact/SubsequentEvents)
Table	Subsequent Events [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Subsequent Events [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Subsequent Event [Axis]**	[Axis]		
5	Subsequent Events, All [Member]	[Member]		
6	Uncollected Receivable [Member]	[Member]		
7	Purchase of Business [Member]	[Member]		
8	**Subsequent Event [Line Items]**	[Line Items]		
9	*Subsequent Event [Hierarchy]*	[Abstract]		
10	Subsequent Event, Description	[Concept] String	For Period	

20.11.4. Description

The *Repeating Concept* business use case builds on the *Simple Compound Fact* use case, pointing out the notion that one fact can act like a compound fact and repeat.

In this example the subsequent event description repeats. Each subsequent event is uniquely described by the Subsequent Event [Axis] value or Member.

20.11.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- Compound facts repeat. You might only have one fact in your financial report, but you might also have any unknown number of such facts, each differentiated by some [Axis].
- In this case, the member of the Subsequent Even [Axis] "Subsequent Event [Member]" would never be used because subsequent events and in particular the description would never be aggregated. However, it is the practice of the US GAAP taxonomy to have such members currently referred to as a [Domain].

20.12. Multiple periods compound fact

The *Multiple Periods Compound Fact* business use case shows how to model what amounts to a *Compound Fact* which is reported for multiple periods within that one *Compound Fact*. The metapattern of this business use case is the **compound fact** and the **hierarchy**.

20.12.1. Visual Example

Sample Company
For Period Ending December 31, 2010

The following is a summary of leasehold land and buildings as of December 31, 2010 and 2009:

State	Location	Description	Tenure	Tenure Start Date	Land Area	2010 Value (at Cost)	2009 Value (at Cost)
pattern:WashingtonMember	Tacoma, Washington	Warehouse	Fifteen year lease	2000-01-01	1,000	5,000	4,000
pattern:WashingtonMember	Seattle, Washington	Warehouse	Twenty year lease	2000-01-01	100,000	50,000	40,000
				Total	101,000	55,000	44,000

20.12.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Leasehold Land and Buildings (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/MultiplePeriodsCompoundFact/LeaseHoldLandAndBuildings)
Table	Leasehold Land and Buildings [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]
State [Axis]	Washington [Member]

Leasehold Land and Building [Line Items]	Period [Axis]					
	2010-01-01 - 2010-12-31			2009-12-31		
	Leasehold Land and Building, Identifier [Axis]			Leasehold Land and Building, Identifier [Axis]		
	Tacoma Warehouse Under 15 Year Lease [Member]	Seattle Warehouse Under 20 Year Lease [Member]	Leaseholds, All [Member]	Tacoma Warehouse Under 15 Year Lease [Member]	Seattle Warehouse Under 20 Year Lease [Member]	Leaseholds, All [Member]
Leasehold Land and Building [Hierarchy]						
Leasehold Land and Buildings, Location	Tacoma, Washington	Seattle, Washington				
Leasehold Land and Buildings, Description of Facility	Warehouse	Warehouse				
Leasehold Land and Buildings, Tenure	Fifteen year lease	Twenty year lease				
Leasehold Land and Buildings, Tenure Start Date	2000-01-01	2000-01-01				
Leasehold Land and Buildings, Land Area	1,000	100,000	101,000			
Leasehold Land and Buildings, Value at Cost	5,000	50,000	55,000	4,000	40,000	44,000

20.12.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Leasehold Land and Buildings (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/MultiplePeriodsCompoundFact/LeaseHoldLandAn
Table	Leasehold Land and Buildings [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Leasehold Land and Buildings [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Leasehold Land and Building, Identifier [Axis]**	[Axis]		
5	Leaseholds, All [Member]	[Member]		
6	Tacoma Warehouse Under 15 Year Lease [Member]	[Member]		
7	Seattle Warehouse Under 20 Year Lease [Member]	[Member]		
8	**State [Axis]**	[Axis]		
9	States, All [Member]	[Member]		
10	Washington [Member]	[Member]		
11	Oregon [Member]	[Member]		
12	California [Member]	[Member]		
13	**Leasehold Land and Building [Line Items]**	[Line Items]		
14	*Leasehold Land and Building [Hierarchy]*	[Abstract]		
15	Leasehold Land and Buildings, Location	[Concept] String	For Period	
16	Leasehold Land and Buildings, Description of Facility	[Concept] String	For Period	
17	Leasehold Land and Buildings, Tenure	[Concept] String	For Period	
18	Leasehold Land and Buildings, Tenure Start Date	[Concept] Date	For Period	
19	Leasehold Land and Buildings, Land Area	[Concept] Decimal	As Of	
20	Leasehold Land and Buildings, Value at Cost	[Concept] Monetary	As Of	

20.12.4. Description

The *Multiple Periods Compound Fact* business use case shows something quite common in financial reporting which is to provide values for both the current and prior period to describe some fact. In the screen shot, note that one value is reported for land area and two values are reported for value, 2010 and 2009. Note the report elements and relations below for the modelling of the concept Leasehold Land and Buildings, Value at Cost.

20.12.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- Notice that the current period and prior period are characteristics provided within the financial report by the Period [Axis] rather than modelling each period within the taxonomy.
- Compare and contrast this use case with the *Simple Compound Fact* use case.
- Note how the information about which state relates to is presented differently in the presentation rendering (the screen shot above) and the automated rendering (the screen shot below); the business semantics remain equivalent.

20.13. Roll forward in compound fact

The *Roll Forward in Compound Fact* business use case shows how to model a *Roll Forward* which is contained within a Compound Fact. This business use case also introduces the notion of the negated label role and the component. The metapattern of this business use case is the **compound fact**, **roll forward**, and the **hierarchy**.

20.13.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

SHARE OWNERSHIP PLANS

The following is information relating to share ownership plan: pattern:ShareOwnershipPlan1Member .

These are the description, general conditions, and terms of share ownership plan 1. Nam rhoncus mi. Nunc eu dui non mauris interdum tincidunt. Sed magna felis, accumsan a, fermentum quis, varius sed, ipsum. Nullam leo. Donec eros. Maecenas interdum, lectus eget aliquet tincidunt, tellus dolor ultrices tellus, nec hendrerit nunc lectus eget eros. Duis feugiat velit in eros. Curabitur tincidunt aliquet neque. Nulla ac est quis urna luctus elementum. Aliquam erat volutpat. In tincidunt nunc vehicula risus. Praesent dictum arcu sit amet wisi. Praesent ac odio. Donec vestibulum, sem vel facilisis consectetuer, justo arcu tempor sem, vel ultrices turpis leo quis augue.

Reconciliation of Outstanding Balance:

Type	Outstanding 2009	Granted	Forfeited	Exercised	Expired	Outstanding 2010
pattern:ShareOwnershipPlan1Member	0	4,000	-1,000	-1,000	-1,000	1,000

20.13.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Share Ownership Plans (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/RollForwardInCompoundFact/ShareOwnershipPlans)
Table	Share Ownership Plan [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]
Share Ownership Plan, Identifier [Axis]	Share Ownership Plan 1 [Member]

Share Ownership Plan [Line Items]	Period [Axis] 2010-01-01 - 2010-12-31
Share Ownership Plan [Hierarchy]	
Share Ownership Plan, Description, General Terms and Conditions	These are the description, general conditions, and terms of share ownership plan 1. Nam rhoncus mi. Nunc eu dui non mauris interdum tincidunt. Sed magna felis, accumsan a, fermentum quis, varius sed, ipsum. Nullam leo. Donec eros. Maecenas interdum, lectus eget aliquet tincidunt, tellus dolor ultrices tellus, nec hendrerit nunc lectus eget eros. Duis feugiat velit in eros. Curabitur tincidunt aliquet neque. Nulla ac est quis urna luctus elementum. Aliquam erat volutpat. In tincidunt nunc vehicula risus. Praesent dictum arcu sit amet wisi. Praesent ac odio. Donec vestibulum, sem vel facilisis consectetuer, justo arcu tempor sem, vel ultrices turpis leo quis augue.
Share Ownership Plan, Share Options Outstanding [Roll Forward]	
Share Ownership Plan, Share Options Outstanding, Beginning Balance	0
Share Ownership Plan, Share Options Granted	4,000
Share Ownership Plan, Share Options Forfeited	(1,000)
Share Ownership Plan, Share Options Exercised	(1,000)
Share Ownership Plan, Share Options Expired	(1,000)
Share Ownership Plan, Share Options Outstanding, Ending Balance	1,000

20.13.3. Model structure

Component: (Network and Table)	
Network	Share Ownership Plans (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/RollForwardInCompoundFact/ShareOwnershipPla
Table	Share Ownership Plan [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Share Ownership Plan [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Share Ownership Plan, Identifier [Axis]**	[Axis]		
5	Share Ownership Plan 1 [Member]	[Member]		
6	**Share Ownership Plan [Line Items]**	[Line Items]		
7	*Share Ownership Plan [Hierarchy]*	[Abstract]		
8	Share Ownership Plan, Description, General Terms and Conditions	[Concept] String	For Period	
9	*Share Ownership Plan, Share Options Outstanding [Roll Forward]*	[Abstract]		
10	Share Ownership Plan, Share Options Outstanding, Beginning Balance	[Concept] Shares	As Of	
11	Share Ownership Plan, Share Options Granted	[Concept] Shares	For Period	
12	Share Ownership Plan, Share Options Forfeited	[Concept] Shares	For Period	
13	Share Ownership Plan, Share Options Exercised	[Concept] Shares	For Period	
14	Share Ownership Plan, Share Options Expired	[Concept] Shares	For Period	
15	Share Ownership Plan, Share Options Outstanding, Ending Balance	[Concept] Shares	As Of	

20.13.4. Description

The *Roll Forward in Compound Fact* shows exactly that, a *Roll Forward* use case modelled within a *Compound Fact* use case. In this business use case the *Roll Forward* is part of the set of information which could repeat, in this case there could be more than one share ownership plan.

Further, the compound fact which could repeat is comprised of two distinct components: a Hierarchy which contains information about the share ownership plan and a Roll Forward which reconciles the beginning and ending balance of the plan.

Finally, within the roll forward are number which do not contain a balance attribute and therefore to polarity of the numbers, in this case shares, is unknown unless that information is somehow made available. In this case a negated label was created and within the relations that preferred label was used. This tells an application rendering the information to reverse the sign of the fact value when rendering.

20.13.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- In this use case a *Roll Forward* exists within a *Compound Fact*, in this case share ownership plans.
- The [Line Items] of the [Table] have two distinct sets or components. You can think of components as pieces of [Line Items] which are generally always used together and generally have a different rendering format.
- Negated label roles are used to indicate that reductions in shares outstanding should be rendered as negative values.

20.14. Nested compound fact

The *Nested Compound Fact* business use case shows how to model what amounts to two sets of information which are interrelated. Another way to look at this is to say that there is a master-detail type of relation between two [Table]s. This business use case also introduces the notion of using custom data type restrictions to control financial report fact values. The metapattern of this business use case is the **compound fact** and the **hierarchy**.

20.14.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

RELATED PARTY TRANSACTIONS

The following is a summary of related party of the company and transactions with those related parties. (Notice how the Related Party Name [Axis] connects the two tables of information together):

Related Parties:

Name of Related Party	Type of Relationship	Nature of Relationship
pattern:RelatedParty1Member	Parent	This is other descriptive information about the relationship.
pattern:RelatedParty2Member	JointVenture	This is other descriptive information about the relationship.

Transactions with Related Parties:

Party	Transaction Description	Pricing Policy	Amount
pattern:RelatedParty1Member	Transaction 1 description	Cost	1000
pattern:RelatedParty1Member	Transaction 2 description	Cost	1000
pattern:RelatedParty2Member	Transaction 1 description	Cost	1000
pattern:RelatedParty2Member	Transaction 2 description	Cost	1000

20.14.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Related Parties (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/NestedCompoundFact/RelatedParties)
Table	Related Parties [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Period [Axis]	2010-01-01 - 2010-12-31
Legal Entity [Axis]	Consolidated Entity [Member]

Related Parties [Line Items]	Related Party Name [Axis]	
	Related Party 1 [Member]	Related Party 2 [Member]
Related Party [Hierarchy]		
Related Party, Type of Relationship	Parent	JointVenture
Related Party, Nature of Relationship	This is other descriptive information about the relationship.	This is other descriptive information about the relationship.

Component: (Network and Table)	
Network	Related Party Transactions (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/NestedCompoundFact/RelatedPartyTransactions)
Table	Related Party Transactions [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Period [Axis]	2010-01-01 - 2010-12-31
Legal Entity [Axis]	Consolidated Entity [Member]

Related Party Transaction [Line Items]	Related Party Name [Axis]			
	Related Party 1 [Member]		Related Party 2 [Member]	
	Related Party Transaction Type [Axis]		Related Party Transaction Type [Axis]	
	Purchase or Sale of Goods with Related Party [Member]	Purchase or Sale of Property or Other Assets with Related Party [Member]	Leasing Arrangements with Related Party [Member]	Purchase or Sale of Goods with Related Party [Member]
Related Party Transaction [Hierarchy]				
Related Party Transaction, Description	Transaction 1 description	Transaction 2 description	Transaction 2 description	Transaction 1 description
Related Party Transaction, Pricing Policy	Cost	Cost	Cost	Cost
Related Party Transaction, Amount	1,000	1,000	1,000	1,000

20.14.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Related Parties (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/NestedCompoundFact/RelatedParties)
Table	Related Parties [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Related Parties [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Related Party Name [Axis]**	[Axis]		
5	Related Party 1 [Member]	[Member]		
6	Related Party 2 [Member]	[Member]		
7	**Related Parties [Line Items]**	[Line Items]		
8	*Related Party [Hierarchy]*	[Abstract]		
9	Related Party, Type of Relationship	[Concept] String	For Period	
10	Related Party, Nature of Relationship	[Concept] String	For Period	

Component: (Network and Table)	
Network	Related Party Transactions (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/NestedCompoundFact/RelatedPartyTransactions)
Table	Related Party Transactions [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Related Party Transactions [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Related Party Name [Axis]**	[Axis]		
5	Related Party 1 [Member]	[Member]		
6	Related Party 2 [Member]	[Member]		
7	**Related Party Transaction Type [Axis]**	[Axis]		
8	Related Party Transaction Type, All [Member]	[Member]		
9	Agency Arrangements with Related Party [Member]	[Member]		
10	Leasing Arrangements with Related Party [Member]	[Member]		
11	Purchase or Sale of Goods with Related Party [Member]	[Member]		
12	Purchase or Sale of Property or Other Assets with Related Party [Member]	[Member]		
13	**Related Party Transaction [Line Items]**	[Line Items]		
14	*Related Party Transaction [Hierarchy]*	[Abstract]		
15	Related Party Transaction, Description	[Concept] String	For Period	
16	Related Party Transaction, Pricing Policy	[Concept] String	For Period	
17	Related Party Transaction, Amount	[Concept] Monetary	For Period	Debit

20.14.4. Description

The *Nested Compound Concept* business use case models a compound fact nested within another compound fact also known as a master-detail type relationship. Consider that an entity can have zero to many related parties and that each of those related parties can have zero or many related party transactions. Those two report relations are modelled in this business use case.

Also, there is a desire to restrict the possible values provided for the types of related party reported. As such, a custom data type is created for the concept RepatedPartyType and an enumerated list of values is provided.

20.14.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- Notice that each [Table] have the [Axis] Related Party Name [Axis]. It is this [Axis] which relates to two [Table]s together.
- Note that [Table]s should not be physically nested as XBRL Dimensions does not allow one [Table] to be nested within another [Table].
- The type of relationship here is common referred to as a master-detail relationship, similar to an invoice master table and second table which contains invoice line items.
- Note that the enumerated values provided for Related Party, Type of Relationship cannot be changed as enumerated lists cannot be extended.

20.15. Reconciliation of balance

The *Reconciliation of Balance* business use case shows how to model a reconciliation of one balance to another balance and to tie the detailed reconciling items to the summary. In addition, this business use case introduces the notion of integrity between the summary and detail information sets. The metapattern of this business use case is the **compound fact**, **roll up**, and the **hierarchy**.

20.15.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	2010	2009
Cash and Cash Equivalents, per Balance Sheet	1,000	1,000
Reconciling Item A	2,500	500
Reconciling Item B	-500	500
Cash and Cash Equivalents, per Cash Flow Statement	3,000	2,000

20.15.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Reconcilation of Cash and Cash Equivalents, Summary (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ReconciliationOfBalance/ReconcilationOfCashSummary)
Table	Reconcilation of Cash, Summary [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Reconcilation of Cash, Summary [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Reconcilation of Cash, Summary [Roll Up]		
Cash and Cash Equivalents	1,000,000	1,000,000
Reconciling Item Amount	2,000,000	1,000,000
Cash and Cash Equivalents, per Cash Flow Statement	3,000,000	2,000,000

Component: (Network and Table)	
Network	Reconcilation of Cash and Cash Equivalents, Detail (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ReconciliationOfBalance/ReconcilationOfCashDetail)
Table	Reconcilation of Cash, Detail [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Reconcilation of Cash, Detail [Line Items]	Period [Axis]					
	2010-01-01 - 2010-12-31			2009-01-01 - 2009-12-31		
	Reconciling Item Type [Axis]			Reconciling Item Type [Axis]		
	Reconciling Item Type A [Member]	Reconciling Item Type B [Member]	Reconciling Item Types, All Types [Member]	Reconciling Item Type A [Member]	Reconciling Item Type B [Member]	Reconciling Item Types, All Types [Member]
Reconciling Item [Hierarchy]						
Reconciling Item Description	Reconciling Item A for 2010	Reconciling Item B for 2010		Reconciling Item A for 2009	Reconciling Item B for 2009	
Reconciling Item Amount	2,500,000	(500,000)	2,000,000	500,000	500,000	1,000,000

20.15.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Reconcilation of Cash and Cash Equivalents, Summary (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ReconciliationOfBalance/ReconcilationOfCashSum
Table	Reconcilation of Cash, Summary [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Reconcilation of Cash, Summary [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Reconcilation of Cash, Summary [Line Items]**	[Line Items]		
5	*Reconcilation of Cash, Summary [Roll Up]*	[Abstract]		
6	Cash and Cash Equivalents	[Concept] Monetary	As Of	Debit
7	Reconciling Item Amount	[Concept] Monetary	As Of	Debit
8	Cash and Cash Equivalents, per Cash Flow Statement	[Concept] Monetary	As Of	Debit

Component: (Network and Table)	
Network	Reconcilation of Cash and Cash Equivalents, Detail (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ReconciliationOfBalance/ReconcilationOfCashDeta
Table	Reconcilation of Cash, Detail [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Reconcilation of Cash, Detail [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Reconciling Item Type [Axis]**	[Axis]		
5	Reconciling Item Types, All Types [Member]	[Member]		
6	Reconciling Item Type A [Member]	[Member]		
7	Reconciling Item Type B [Member]	[Member]		
8	**Reconcilation of Cash, Detail [Line Items]**	[Line Items]		
9	*Reconciling Item [Hierarchy]*	[Abstract]		
10	Reconciling Item Description	[Concept] String	For Period	
11	Reconciling Item Amount	[Concept] Monetary	As Of	Debit

20.15.4. Description

The *Reconciliation of Balance* business use case reconciles two different concepts at the same point in time. In the example shown, Cash and Cash Equivalents per the balance sheet is reconciled to Cash and Cash Equivalents per the cash flow statement. (The example assumes that the two balances are different as could be the case with IFRS.) In addition, the summary information ties to detailed information about the reconciling items.

20.15.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- The summary information is basically a very simple roll up.
- The detailed information is a compound fact.
- The summary [Table] and the detailed [Table] intersect via the "Reconciling Item Amount" concept and the "Reconciling Item Types, All Types [Member]".
- The [Axis] must assign dimension-defaults to the "Reconciling Item Type [Axis]". In this example, the "Legal Entity [Axis]" was also assigned a dimension-default.

- Compare the XBRL instance and the fact tables, note that the [Axis] do not physically exist in the XBRL instance, but do exist within the fact tables.

20.16. Adjustment

An *adjustment* information model reconciles an originally stated balance to a restated balance, the adjustment being the total change, between two different report dates. An adjustment is similar to a roll forward in that it is a reconciliation, however rather than the Period [Axis] changing; it is the *Report Date [Axis]* which changes: originally reported balance + adjustment = restated balance.

The *Adjustment* metapattern shows how to model an adjustment to a prior period financial statement for a change in accounting policy or correction of an error as defined by financial reporting standards. This same approach can be used for making adjustments to other beginning balances not related to financial reporting. The metapattern of this business use case is the **adjustment**.

20.16.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	2010	2009
Prior Period Adjustment		
Retained Earnings (Accumulated Losses), Originally Stated 2009	4,000	
Change in Accounting Policy	3,000	
Correction of an Error	-1,000	
Retained Earnings (Accumulated Losses), Restated 2009 Beginning Balance	6,000	

20.16.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	50000 - Prior Period Adjustments (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCases/Adjustment/PriorPeriodAdjustments)
Table	Prior Period Adjustments [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Prior Period Adjustments [Line Items]	Report Date [Axis]	Period [Axis] 2009-12-31
Retained Earnings (Accumulated Losses), Origionally Stated	Reported March 21, 2010 [Member]	4,000
Changes in Accounting Policy	Reported March 18, 2011 [Member]	3,000
Correction of an Error	Reported March 18, 2011 [Member]	(1,000)
Prior Period Adjustments, Period Increase (Decrease), Total	Reported March 18, 2011 [Member]	2,000
Retained Earnings (Accumulated Losses), Restated	Reported March 18, 2011 [Member]	6,000

[CSH: This has numerous rendering errors. [Roll Up] and [Adjustment] abstract concepts are not shown and the Report Date [Axis] column width is too narrow.]

20.16.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	50000 - Prior Period Adjustments (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCases/Adjustment/PriorPeriodAdjustments)
Table	Prior Period Adjustments [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Prior Period Adjustments [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Report Date [Axis]**	[Axis]		
5	Reported March 21, 2010 [Member]	[Member]		
6	Reported March 18, 2011 [Member]	[Member]		
7	**Prior Period Adjustments [Line Items]**	[Line Items]		
8	*Prior Period Adjustments to Retained Earnings [Adjustment]*	[Abstract]		
9	Retained Earnings (Accumulated Losses), Origionally Stated	[Concept] Monetary	As Of	Credit
10	*Prior Period Adjustments, Period Increase (Decrease), Total [Roll Up]*	[Abstract]		
11	Changes in Accounting Policy	[Concept] Monetary	As Of	Credit
12	Correction of an Error	[Concept] Monetary	As Of	Credit
13	Prior Period Adjustments, Period Increase (Decrease), Total	[Concept] Monetary	As Of	Credit
14	Retained Earnings (Accumulated Losses), Restated	[Concept] Monetary	As Of	Credit

20.16.4. Description

The example *Adjustment* above reconciles the Retained Earnings (Accumulated Losses), Originally Stated in 2009 to its Restated 2009 Beginning Balance via the Prior Period Adjustments which make up the change. Note that an *Adjustment* looks similar in presentation to a roll forward, however it is different in that a different [Axis] is changing.

An *Adjustment* can be identified by software applications by the business rule which computes the adjustment to verify that it is correctly articulated within the XBRL instance: originally stated + adjustment = restated balance over a changing *Report Date [Axis]*.

20.16.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- An *Adjustment* reconciles two balances at the same point in time, the first balance being the originally stated balance and the second the restated balance.
- A common use for an adjustment is reporting an adjustment to retained earnings for a prior period error or change in accounting policy.
- Note that the concepts relating to the adjustment amount are as of a point in time.
- Note that there are two domain partitions.
- The adjustments could be from a roll forward or individual adjustments, for example: originally stated + adjustment1 + adjustment2 + adjustment*N* = restated balance

20.17. Variance

A *variance* information model reconciles some reporting scenario with another reporting scenario, the variance between reporting scenarios being the variance or changes. For example, a sales analysis which reconciles the concept sales for the reporting scenarios of actual and budgeted is a variance. The equation in this case is: actual – budget = variance. But a variance could take other forms such as a variance from forecast, variance from plan, etc. The metapattern of this business use case is the **variance** and **hierarchy**. Any metapattern could be modelled as variance.

A variance is characterised by a changing Reporting Scenario [Axis] and the information model of a variance could take the form of any information model such as a hierarchy, roll up, roll forward, etc.

20.17.1. Visual Example

Sample Company
For Period Ending December 31, 2010

Concept	Actual	Budgeted	*Variance*
Sales	6,000	5,000	*1,000*
Cost of Goods Sold	4,000	3,000	*1,000*
Contribution Margin	1,000	2,000	*-1,000*
Distribution Costs	1,000	1,000	*0*

20.17.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	60000 - Variance Analysis (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCases/Variance/VarianceAnalysis)
Table	Variance Analysis [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Period [Axis]	2010-01-01 - 2010-12-31
Legal Entity [Axis]	Consolidated Entity [Member]

Variance Analysis [Line Items]	Reporting Scenario [Axis]		
	Actual [Member]	Budgeted [Member]	Reporting Scenarios, All [Member]
Variance Analysis [Hierarchy]			
Sales	6,000	5,000	1,000
Cost of Goods Sold	4,000	3,000	1,000
Contribution Margin	1,000	2,000	(1,000)
Distribution Costs	1,000	1,000	0

20.17.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	60000 - Variance Analysis (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCases/Variance/VarianceAnalysis)
Table	Variance Analysis [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Variance Analysis [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Reporting Scenario [Axis]**	[Axis]		
5	Reporting Scenarios, All [Member]	[Member]		
6	Actual [Member]	[Member]		
7	Budgeted [Member]	[Member]		
8	**Variance Analysis [Line Items]**	[Line Items]		
9	*Variance Analysis [Hierarchy]*	[Abstract]		
10	Sales	[Concept] Monetary	For Period	Credit
11	Cost of Goods Sold	[Concept] Monetary	For Period	Debit
12	Contribution Margin	[Concept] Monetary	For Period	Credit
13	Distribution Costs	[Concept] Monetary	For Period	Debit

20.17.4. Description

A *Variance* reconciles two different reporting scenarios differentiated using the *Reporting Scenarios [Axis]*, in the case here *Actual [Member]* and *Budgeted [Member]*, the difference being the variance, or *Reporting Scenarios, All [Member]*.

A *Variance* can be identified by software applications by the business rule which verifies and computes the variance, Actual [Member] + Budgeted [Member] = Reporting Scenarios, All [Member], all within the *Reporting Scenario [Axis]*.

20.17.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- The *Variance* use case shows how to report facts for different reporting scenarios.
- The *Variance* could be combined with many different types of information models.

20.18. Complex computation

A *Complex Computation* information model can be thought of as a hierarchy plus a set of commutations between different concepts within that hierarchy which are challenging to model as the parent/child relations of a graph. The type of computations can vary significantly, thus the challenging in modelling. For example, the computation of earnings per share is a complex computation. The metapattern of this business use case is the **complex computation** and **hierarchy**.

20.18.1. Visual Example

Sample Company
For Period Ended December 31,

	2010	2009
OTHER INFORMATION		
Earnings Per Share Components		
Net Income (Loss)	10,000,000	20,000,000
Weighted Average Common Shares	100,000,000	100,000,000
Earnings Per Share	0.10	0.20

20.18.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	70000 - Earnings Per Share Components (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCases/ComplexComputation/EarningsPerShareComponents)
Table	Earnings Per Share Components [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Earnings Per Share Components [Line Items]	Period [Axis]	
	2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31
Earnings Per Share Components [Hierarchy]		
Net Income (Loss)	10,000,000	20,000,000
Weighted Average Common Shares	100,000,000	100,000,000
Earnings Per Share	.10	.20

20.18.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	70000 - Earnings Per Share Components (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCases/ComplexComputation/EarningsPerShareCompon
Table	Earnings Per Share Components [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Earnings Per Share Components [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Earnings Per Share Components [Line Items]**	[Line Items]		
5	*Earnings Per Share Components [Hierarchy]*	[Abstract]		
6	Net Income (Loss)	[Concept] Monetary	For Period	Credit
7	Weighted Average Common Shares	[Concept] Shares	For Period	
8	Earnings Per Share	[Concept] Decimal	For Period	

20.18.4. Description

Any information set can be modelled as a hierarchy metapattern. A hierarchy is nothing more than a set of relations. If you add computations to the hierarchy, indicating that the concepts within that hierarchy have some set of computation type relations, then you get what is shown in this business use case, a *Complex Computation*.

20.18.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- A complex computation is a hierarchy of concepts, some of which are numeric and there are computation-type relations between the numeric concepts.
- Many types of computation-type relations can be difficult to express as a parent-child hierarchy, thus the need to use XBRL formula to express these business rules.

20.19. Text block

The *Text Block* business use case shows how one fragment of information or multiple pieces of information can be put reported together within on "block of text", as opposed to modelling the individual pieces of information. Note the *Prose* and *Escaped XHTML* business use cases which expand on this business use case. The metapattern of this business use case is the **text block**.

20.19.1. Visual Example

Sample Company
December 31, 2010

Accounting Policies

Duis fermentum

Sed mauris. Nulla facilisi. Fusce tristique posuere ipsum. Nulla facilisi. Aliquam viverra risus vitae ante. Sed rhoncus mi in wisi. Nullam nibh dui, molestie vitae, imperdiet non, ornare at, elit.

- Suspendisse accumsan, arcu vel ornare interdum, magna tellus porta mauris, in porta mi lacus sodales felis.
- Phasellus eleifend, diam vitae dapibus pulvinar, erat ligula auctor dui, eget congue justo lorem hendrerit tellus.
- Fusce gravida, ligula a placerat placerat, leo erat euismod lectus, et lacinia justo libero non pede.

DONEC PULVINAR NONUMMY ERAT

Etiam porttitor. Ut venenatis, velit a accumsan interdum, odio metus mollis mauris, non pharetra augue arcu eu felis. Ut eget felis. Mauris leo nulla, sodales et, pharetra quis, fermentum nec, diam.

20.19.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	20000 - Accounting Policies (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/TextBlock/AccountingPolicies)
Table	Accounting Policies [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Accounting Policies [Line Items]	Period [Axis]
	2010-01-01 - 2010-12-31
Accounting Policies [Text Block]	Duis fermentum Sed mauris. Nulla facilisi. Fusce tristique posuere ipsum. Nulla facilisi. Aliquam viverra risus vitae ante. Sed rhoncus mi in wisi. Nullam nibh dui, molestie vitae, imperdiet non, ornare at, elit. • Suspendisse accumsan, arcu vel ornare interdum, magna tellus porta mauris, in porta mi lacus sodales felis. • Phasellus eleifend, diam vitae dapibus pulvinar, erat ligula auctor dui, eget congue justo lorem hendrerit tellus. • Fusce gravida, ligula a placerat placerat, leo erat euismod lectus, et lacinia justo libero non pede. Fusce gravida, ligula a placerat placerat, leo erat euismod lectus, et lacinia justo libero non pede. Vivamus ac velit vel magna nonummy pretium. 1. Etiam ut augue 2. Aliquam erat volutpat DONEC PULVINAR NONUMMY ERAT Etiam porttitor. Ut venenatis, velit a accumsan interdum, odio metus mollis mauris, non pharetra augue arcu eu felis. Ut eget felis. Mauris leo nulla, sodales et, pharetra quis, fermentum nec, diam.

20.19.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	20000 - Accounting Policies (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/TextBlock/AccountingPolicies)
Table	Accounting Policies [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Accounting Policies [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Accounting Policies [Line Items]**	[Line Items]		
5	Accounting Policies [Text Block]	[Concept] String	For Period	

20.19.4. Description

The *Text Block* business use case shows how information can be communicated as a "block of text" rather than reporting individual components. The reason this is referred to as a "text block" is that originally in the US GAAP Taxonomy a text block was to report literally a block of text. This has subsequently changed and instead of text, escaped XHTML is reported. The escaped XHTML is converted into actual XHTML and then the XHTML is rendered. In this example, one concept is used to communicate information about accounting policies.

Because of formatting considerations and little control over text other than tabs, spaces, and line feeds; the escaped XHTML is used rather than plain text.

20.19.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- When a text block is used, one fact value is used to articulate a "block" of information, rather than breaking the block into individual facts. The up side is that articulating the information is easier as less work is involved. The down side is that the user of the information cannot get to the details of the block of information, they can only use the set as one unit of information.

20.20. Prose

The *Prose* business use case shows how to model prose or information which has sophisticated formatting referred to as prose or as narrative such as tables, lists, paragraphs which should be read in a specific order or sequence. The metapattern of this business use case is the **text block**.

20.20.1. Visual Example

Sample Company
For Period Ending December 31, 2010

SOME SET OF BUSINESS INFORMATION

The following is a summary of some set of business information for the period ended December 31, 2010:

Proin elit sem, ornare non, ullamcorper vel, sollicitudin a, lacus. Mauris tincidunt cursus est. Nulla sit amet nibh. Sed elementum feugiat augue. Nam non tortor non leo porta bibendum. Morbi eu pede.

Sed justo: Nibh, placerat

Praesent eleifend	Lorem ipsum dolor	Suspendisse	Maecenas ante	Phasellus sagittis orci quis orci
Vivamus quis nunc	1,000	1,000	1,000	1,000
Proin porta tincidunt nunc	1,000	1,000	1,000	1,000
Pellentesque condimentum	2,000	2,000	2,000	2,000

Duis fermentum

Sed mauris. Nulla facilisi. Fusce tristique posuere ipsum. Nulla facilisi. Aliquam viverra risus vitae ante. Sed rhoncus mi in wisi. Nullam nibh dui, molestie vitae, imperdiet non, ornare at, elit.

- Suspendisse accumsan, arcu vel ornare interdum, magna tellus porta mauris, in porta mi lacus sodales felis.
- Phasellus eleifend, diam vitae dapibus pulvinar, erat ligula auctor dui, eget congue justo lorem hendrerit tellus.
- Fusce gravida, ligula a placerat placerat, leo erat euismod lectus, et lacinia justo libero non pede.

Fusce gravida, ligula a placerat placerat, leo erat euismod lectus, et lacinia justo libero non pede. Vivamus ac velit vel magna nonummy pretium.

1. Etiam ut augue
2. Aliquam erat volutpat

Sed justo: Nibh, placerat

	20XX	20XX
Sed dapibus dui quis lectus; Donec id sem. Integer sit amet 2% diam ac nibh consequat vestibulum; Sed eget augue malesuada quam adipiscing mattis	23,480	46,080
Sed lobortis, Maecenas scelerisque ullamcorper libero, Aliquam porta $880 leo imperdiet pede	85,000	-
Nunc congue. Fusce venenatis. Maecenas tincidunt, ipsum in fringilla hendrerit, dolor metus eleifend neque, vel tincidunt mi nunc a purus	-	45,000
Fusce venenatis. Maecenas tincidunt, ipsum in fringilla $1,200 hendrerit, dolor metus eleifend neque, vel tincidunt mi nunc a purus	33,301	43,782
Pellentesque	141,781	134,862

DONEC PULVINAR NONUMMY ERAT

Etiam porttitor. Ut venenatis, velit a accumsan interdum, odio metus mollis mauris, non pharetra augue arcu eu felis. Ut eget felis. Mauris leo nulla, sodales et, pharetra quis, fermentum nec, diam.

20.20.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Some Set of Business Information (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Prose/SomeSetOfBusinessInformation)
Table	Some Set of Business Information [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]
Some Characteristic [Axis]	Some Characteristic [Member]

Some Set of Business Information [Line Items]	Period [Axis] 2010-01-01 - 2010-12-31
Some Set of Business Information [HTML]	

Proin elit sem, ornare non, ullamcorper vel, sollicitudin a, lacus. Mauris tincidunt cursus est. Nulla sit amet nibh. Sed elementum feugiat augue. Nam non tortor non leo porta bibendum. Morbi eu pede.

Sed justo: Nibh, placerat

Praesent eleifend	Lorem ipsum dolor	Suspendisse	Maecenas ante	Phasellus sagittis orci quis orci
Vivamus quis nunc	1,000	1,000	1,000	1,000
Proin porta tincidunt nunc	1,000	1,000	1,000	1,000
Pellentesque condimentum	2,000	2,000	2,000	2,000

Duis fermentum

Sed mauris. Nulla facilisi. Fusce tristique posuere ipsum. Nulla facilisi. Aliquam viverra risus vitae ante. Sed rhoncus mi in wisi. Nullam nibh dui, molestie vitae, imperdiet non, ornare at, elit.

- Suspendisse accumsan, arcu vel ornare interdum, magna tellus porta mauris, in porta mi lacus sodales felis.
- Phasellus eleifend, diam vitae dapibus pulvinar, erat ligula auctor dui, eget congue justo lorem hendrerit tellus.
- Fusce gravida, ligula a placerat placerat, leo erat euismod lectus, et lacinia justo libero non pede.

Fusce gravida, ligula a placerat placerat, leo erat euismod lectus, et lacinia justo libero non pede. Vivamus ac velit vel magna nonummy pretium.

1. Etiam ut augue
2. Aliquam erat volutpat

Sed justo: Nibh, placerat

	20XX	20XX
Sed dapibus dui quis lectus; Donec id sem. Integer sit amet 2% diam ac nibh consequat vestibulum; Sed eget augue malesuada quam adipiscing mattis	23,480	46,080
Sed lobortis, Maecenas scelerisque ullamcorper libero, Aliquam porta $880 leo imperdiet pede	85,000	-
Nunc congue. Fusce venenatis. Maecenas tincidunt, ipsum in fringilla hendrerit, dolor metus eleifend neque, vel tincidunt mi nunc a purus	-	45,000
Fusce venenatis. Maecenas tincidunt, ipsum in fringilla $1,200 hendrerit, dolor metus eleifend neque, vel tincidunt mi nunc a purus	33,301	43,782
Pellentesque	141,781	134,862

DONEC PULVINAR NONUMMY ERAT

Etiam porttitor. Ut venenatis, velit a accumsan interdum, odio metus mollis mauris, non pharetra augue arcu eu felis. Ut eget felis. Mauris leo nulla, sodales et, pharetra quis, fermentum nec, diam.

20.20.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Some Set of Business Information (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Prose/SomeSetOfBusinessInformation)
Table	Some Set of Business Information [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Some Set of Business Information [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Some Characteristic [Axis]**	[Axis]		
5	Some Characteristic [Member]	[Member]		
6	**Some Set of Business Information [Line Items]**	[Line Items]		
7	Some Set of Business Information [HTML]	[Concept] String	For Period	

20.20.4. Description

The *Prose* or narrative business use case shows how information can be disclosed if the ordering of the information matters and if rather than disclosing individual pieces of information, an entire set of information can be articulated as one fact value. This use case is similar to the *Escaped XHTML* and *Text Block* use cases.

20.20.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- Escaped XHTML is used to disclose such prose (rather than normal XHTML) because XBRL items must not contain mark up. To overcome this constraint, the mark up characters are escaped, thus converting "<" into "<" and ">" into ">".
- Conversion from escaped XHTML to normal XHTML is a well understood process, easily done by software applications.
- Other XML formats can be escaped in the same manner, basically allowing for different types of XML data to be imbedded within XBRL.
- Eventually XBRL may be changed to allow specific data types to appear within specific XBRL data type; for example a specific data type "XHTML", not requiring the escaping process to be used.

20.21. Escaped XHTML

The *Escaped XHTML* business use case is a variation of a *Text Block* and models how one can make use of HTML (hypertext mark-up language) to achieve pixel perfect renderings of information which has complex information structures. The metapattern of this business use case is the **text block**.

20.21.1. Visual Example

Sample Company
For Period Ending December 31, 2010

DIRECTOR COMPENSATION

The following is a summary of director compensation for the period ended December 31, 2010:

Table 1: Director's compensation

Name of director	Salary	Bonus	Director fees	Fair Value of Options Granted
Jane Doe	1,000	1,000	1,000	1,000
John Doe	1,000	1,000	1,000	1,000
Total	2,000	2,000	2,000	2,000

20.21.2. Metapattern(s) employed

Component: (Network and Table)	
Network	Director Compensation (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/EscapedXHTML/DirectorCompensation)
Table	Director Compensation [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Director Compensation [Line Items]	Period [Axis] 2010-01-01 - 2010-12-31				
Director [Hierarchy]					
Director Compensation [HTML]	Name of director	Salary	Bonus	Director fees	Fair Value of Options Granted
	Jane Doe	1,000	1,000	1,000	1,000
	John Doe	1,000	1,000	1,000	1,000
	Total	2,000	2,000	2,000	2,000

20.21.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Director Compensation (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/EscapedXHTML/DirectorCompensation)
Table	Director Compensation [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Director Compensation [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Director Compensation [Line Items]**	[Line Items]		
5	*Director [Hierarchy]*	[Abstract]		
6	Director Compensation [HTML]	[Concept] String	For Period	

20.21.4. Description

The *Escaped XHTML* business use case is basically the same as the *Text Block* and *Prose* business use case. All these business use cases show how information can be modelled if there is formatted structure to the information or if there is a desire to model the information as a set, rather than modelling each detailed fact which may exist in the information set.

20.21.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- While a business user cannot parse the details of the information set, this type of an approach can be useful in modelling certain detailed information.

20.22. Using JSON

The *JSON* business use case models how to articulate data primarily for the purpose of exchanging a set of information. JSON (pronounced Jayson) is an approach to formatting data. Other formats such as CSV (comma separated values) could likewise use this approach. The metapattern of this business use case is the **text block**.

20.22.1. Visual Example


```
{"DirectorCompensation":
   [
      {
         "DirectorName":"Jane Doe",
         "Salary":"1,000",
         "Bonus":"1,000",
         "DirectorFees":"1,000",
         "FairValueOfOptionsGranted":"1,000"
      },
      {
         "DirectorName":"John Doe",
         "Salary":"1,000",
         "Bonus":"1,000",
         "DirectorFees":"1,000",
         "FairValueOfOptionsGranted":"1,000"
      },
      {
         "DirectorName":"All Directors",
         "Salary":"2,000",
         "Bonus":"2,000",
         "DirectorFees":"2,000",
         "FairValueOfOptionsGranted":"2,000"
      }
   ]
}
```


20.22.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Director Compensation (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/UsingJSON/DirectorCompensation)
Table	Director Compensation [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Director Compensation [Line Items]	Period [Axis]
	2010-01-01 - 2010-12-31
Director Compensation [JSON]	{"DirectorCompensation": [{ "DirectorName":"Jane Doe", "Salary":"1,000", "Bonus":"1,000", "DirectorFees":"1,000", "FairValueOfOptionsGranted":"1,000" }, { "DirectorName":"John Doe", "Salary":"1,000", "Bonus":"1,000", "DirectorFees":"1,000", "FairValueOfOptionsGranted":"1,000" }, { "DirectorName":"All Directors", "Salary":"2,000", "Bonus":"2,000", "DirectorFees":"2,000", "FairValueOfOptionsGranted":"2,000" }] }

20.22.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Director Compensation (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/UsingJSON/DirectorCompensation)
Table	Director Compensation [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Director Compensation [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Director Compensation [Line Items]**	[Line Items]		
5	Director Compensation [JSON]	[Concept] String	For Period	

20.22.4. Description

JSON (Java Script Object Notation, see http://www.json.org) is a data format which is similar to CSV but more powerful because it can express a hierarchy. JSON can be useful in exchanging information, this is how such information can be modelled using XBRL. CSV or other formats can be used in a similar manner.

20.22.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- The *Using JSON* business use case is similar to the *Text Block*, *Prose*, *Escaped XHTML* use cases in that a set of information is modelled as one concept and in a financial report, that one Fact holds the complete set of information.
- This is one approach to modelling some formatted set of information. CSV or other data formats could also be used.

20.23. General comment (parenthetical explanation)

The *General Comment* business use case shows how to include a comment (implemented as an XBRL footnote) within a financial report which includes additional information about a fact which is reported. Any metapattern can use a parenthetical explanation.

20.23.1. Visual Example

Sample Company
For Period Ending December 31,
(thousands of dollars, except number of employees)

	2010	2009	2008	2007	2006
Sales, Net	1,500	1,400	1,300	1,200	1,100
Income (Loss) from Continuing Operations	500	400	300	200	100
Net Income (Loss) *(a) (c)*	51	41	31	21	11
Cash Flow Provided by (used in) Operating Activities, Net	5,000	4,000	3,000	2,000	1,000
Capital Additions	1,000	650	550	450	350
Average Number of Employees *(b) (c)*	300	290	280	270	260

COMMENTS:

(a). XBRL Footnote: This is an XBRL footnote, there is no 'categorization' as to what this is for. This indicates that the report is trying to tell you something about the Fact 'pattern:NetIncomeLoss' for a specific context.
(b). XBRL Footnote: This is another XBRL footnote, again, trying to tell you something about the average number of employees.
(c). This comment hooks two reported Facts together, average number of employees and net income for 2010.

20.23.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Financial Highlights (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCases/GeneralComment/FinancialHighlights)
Table	Financial Highlights [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Financial Highlights [Line Items]	Period [Axis]				
	2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31	2008-01-01 - 2008-12-31	2007-01-01 - 2007-12-31	2006-01-01 - 2006-12-31
Financial Highlights [Hierarchy]					
Sales, Net	1,500,000	1,400,000	1,300,000	1,200,000	1,100,000
Income (Loss) from Continuing Operations	500,000	400,000	300,000	200,000	100,000
Net Income (Loss)	51,000 [3,1]	41,000	31,000	21,000	11,000
Cash Flow Provided by (Used in) Operating Activities, Net	5,000,000	4,000,000	3,000,000	2,000,000	1,000,000
Capital Additions	1,000,000	650,000	550,000	450,000	350,000
Average Number of Employees	300 [1,2]	290	280	270	260

1: This comment hooks two reported Facts together, average number of employees and net income for 2010.
2: XBRL Footnote: This is another XBRL footnote, again, trying to tell you something about the average number of employees.
3: XBRL Footnote: This is an XBRL footnote, there is no 'categorization' as to what this is for. This indicates that the report is trying to tell you something about the Fact 'pattern:NetIncomeLoss' for a

20.23.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Financial Highlights (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCases/GeneralComment/FinancialHighlights)
Table	Financial Highlights [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Financial Highlights [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Financial Highlights [Line Items]**	[Line Items]		
5	*Financial Highlights [Hierarchy]*	[Abstract]		
6	Sales, Net	[Concept] Monetary	For Period	Credit
7	Income (Loss) from Continuing Operations	[Concept] Monetary	For Period	Credit
8	Net Income (Loss)	[Concept] Monetary	For Period	Credit
9	Cash Flow Provided by (Used in) Operating Activities, Net	[Concept] Monetary	For Period	Debit
10	Capital Additions	[Concept] Monetary	For Period	Debit
11	Average Number of Employees	[Concept] Decimal	For Period	

20.23.4. Description

The *General Comment* business use case shows how a comment of any sort can be associated with any fact being reported. In addition, facts can be linked together indicating that they are related in some arbitrary way. These comments are implemented as an XBRL footnote.

20.23.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- The only difference between the Flat Hierarchy and this business use case is the addition of an XBRL footnote within the financial report.
- A specific role and arcrole can be used to categorize an XBRL footnote which is contained within a financial report.
- See the *Reclassification* and *Reason Not Reported* business use cases which show other categories of XBRL footnotes.
- Note that XBRL footnotes can be used to associate one or more facts to one or more other Facts, effectively expressing a set of related facts.

20.24. Classes

The *Classes* business use case shows how information can be modelled as concepts or as the members of an [Axis]. Please note the *Simple Roll Up* business use case which models the classes of property, plant, and equipment as concepts. This business use cases models classes of property, plant, and equipment as the members of an [Axis]. The metapattern of this business use case is the **hierarchy**.

20.24.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	2010	2009
ASSETS		
Property, Plant, and Equipment, Net		
Land	5,347	1,147
Buildings, Net	244,508	366,375
Furniture and Fixtures, Net	34,457	34,457
Computer Equipment, Net	4,169	5,313
Other Property, Plant, and Equipment, Net	6,702	6,149
Property, Plant and Equipment, Net, Total	295,183	413,441

20.24.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Property, Plant, and Equipment, by Component (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Classes/PropertyPlantAndEquipmentByComponent)
Table	Property, Plant and Equipment, by Component [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Property, Plant and Equipment, by Component [Line Items]	Period [Axis]											
	2010-12-31						2009-12-31					
	Class of Property, Plant and Equipment [Axis]						Class of Property, Plant and Equipment [Axis]					
	Land [Member]	Buildings [Member]	Furniture and Fixtures [Member]	Computer Equipment [Member]	Other Property, Plant and Equipment [Member]	All Classes of Property, Plant and Equipment [Member]	Land [Member]	Buildings [Member]	Furniture and Fixtures [Member]	Computer Equipment [Member]	Other Property, Plant and Equipment [Member]	All Classes of Property, Plant and Equipment [Member]
Property, Plant and Equipment, Net [Hierarchy]												
Property, Plant and Equipment, Net	5,347,000	244,508,000	34,457,000	4,169,000	6,702,000	295,183,000	1,147,000	366,375,000	34,457,000	5,313,000	6,149,000	413,441,000

20.24.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Property, Plant, and Equipment, by Component (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Classes/PropertyPlantAndEquipmentByComponen
Table	Property, Plant and Equipment, by Component [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Property, Plant and Equipment, by Component [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Class of Property, Plant and Equipment [Axis]**	[Axis]		
5	All Classes of Property, Plant and Equipment [Member]	[Member]		
6	Land [Member]	[Member]		
7	Buildings [Member]	[Member]		
8	Furniture and Fixtures [Member]	[Member]		
9	Computer Equipment [Member]	[Member]		
10	Other Property, Plant and Equipment [Member]	[Member]		
11	**Property, Plant and Equipment, by Component [Line Items]**	[Line Items]		
12	*Property, Plant and Equipment, Net [Hierarchy]*	[Abstract]		
13	Property, Plant and Equipment, Net	[Concept] Monetary	As Of	Debit

20.24.4. Description

This business use case shows an alternative approach to modelling the *Simple Roll Up* business use case. Be sure to compare that business use case with this business use case noting the difference. There is no difference in the business semantics between these two use cases.

20.24.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- The *Classes* business use cases points out that there are alternative approaches to modelling the same information. Contrast the approach used in this use case with the *Simple Roll Up* use case to see two approaches to adding taxonomy information: as a concept or as a member of an [Axis].
- Choosing whether to model information as a concept or as a member of an [Axis] should be done consistently with some clear strategy being communicated.
- Each approach has various pros and cons. It is these pros and cons which will generally determine the most appropriate option.
- Note that the members of an [Axis] can have what amount to any number of properties associated with a class. By modelling something as a concept this is not possible. See the *Class Properties* business use case.

20.25. Class properties

The *Class Properties* business use case expands on the Classes business use case showing how concepts can be related to other concepts by an [Axis] is classes are expressed using [Member]s of an [Axis]. By contrast, [Line Items] expressed using concepts where there are no [Axis] in common and when they are expressed in different [Table]s are not related in any way. The metapattern of this business use case is the **hierarchy** and **roll up**.

20.25.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

Property, Plant and Equipment Policies

Class	Valuation Basis	Depreciation Method	Estimated Useful Life
Land	Mauris tincidunt cursus est	NA	NA
Buildings	Sed dapibus venenatis ipsum	Etiam porttitor	20 years
Furniture and Fixtures	Nunc congue	Maecenas tincidunt	10 years
Computer Equipment	Suspendisse potenti	Maecenas tincidunt	5 years
Other	Phasellus eleifend	Maecenas tincidunt	5 years

Property, Plant, and Equipment, Net, Components

	2010	2009
Land	5,347	1,147
Buildings, Net	244,508	366,375
Furniture and Fixtures, Net	34,457	34,457
Computer Equipment, Net	4,169	5,313
Other Property, Plant, and Equipment, Net	6,702	6,149
Property, Plant and Equipment, Net, Total	295,183	413,441

20.25.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Property, Plant, and Equipment, Policies (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ClassProperties/PropertyPlantAndEquipmentPolicies)
Table	Property, Plant and Equipment, Policies [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Period [Axis]	2010-01-01 - 2010-12-31
Legal Entity [Axis]	Consolidated Entity [Member]

Property, Plant and Equipment, Policies [Line Items]	Class of Property, Plant and Equipment [Axis]				
	Land [Member]	Buildings [Member]	Furniture and Fixtures [Member]	Computer Equipment [Member]	Other Property, Plant and Equipment [Member]
Property, Plant and Equipment, Policies [Hierarchy]					
Valuation Basis	Mauris tincidunt cursus est	Sed dapibus venenatis ipsum	Nunc congue	Suspendisse potenti	Phasellus eleifend
Depreciation Method	NA	Etiam porttitor	Maecenas tincidunt	Maecenas tincidunt	Maecenas tincidunt
Estimated Useful Life	NA	20 years	10 years	5 years	5 years

Component: (Network and Table)	
Network	Property, Plant, and Equipment, by Component (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ClassProperties/PropertyPlantAndEquipmentByComponent)
Table	Property, Plant and Equipment, by Component [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Property, Plant and Equipment, by Component [Line Items]	Period [Axis]											
	2010-12-31						2009-12-31					
	Class of Property, Plant and Equipment [Axis]						Class of Property, Plant and Equipment [Axis]					
	Land [Member]	Buildings [Member]	Furniture and Fixtures [Member]	Computer Equipment [Member]	Other Property, Plant and Equipment [Member]	All Classes of Property, Plant and Equipment [Member]	Land [Member]	Buildings [Member]	Furniture and Fixtures [Member]	Computer Equipment [Member]	Other Property, Plant and Equipment [Member]	All Classes of Property, Plant and Equipment [Member]
Property, Plant and Equipment, Net [Hierarchy]												
Property, Plant and Equipment, Net	5,347,000	244,508,000	34,457,000	4,169,000	6,702,000	295,183,000	1,147,000	366,375,000	34,457,000	5,313,000	6,149,000	413,441,000

20.25.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Property, Plant, and Equipment, Policies (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ClassProperties/PropertyPlantAndEquipmentPolici
Table	Property, Plant and Equipment, Policies [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Property, Plant and Equipment, Policies [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Class of Property, Plant and Equipment [Axis]**	[Axis]		
5	All Classes of Property, Plant and Equipment [Member]	[Member]		
6	Land [Member]	[Member]		
7	Buildings [Member]	[Member]		
8	Furniture and Fixtures [Member]	[Member]		
9	Computer Equipment [Member]	[Member]		
10	Other Property, Plant and Equipment [Member]	[Member]		
11	**Property, Plant and Equipment, Policies [Line Items]**	[Line Items]		
12	*Property, Plant and Equipment, Policies [Hierarchy]*	[Abstract]		
13	Valuation Basis	[Concept] String	For Period	
14	Depreciation Method	[Concept] String	For Period	
15	Estimated Useful Life	[Concept] String	For Period	

Component: (Network and Table)	
Network	Property, Plant, and Equipment, by Component (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ClassProperties/PropertyPlantAndEquipmentByCo
Table	Property, Plant and Equipment, by Component [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Property, Plant and Equipment, by Component [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Class of Property, Plant and Equipment [Axis]**	[Axis]		
5	All Classes of Property, Plant and Equipment [Member]	[Member]		
6	Land [Member]	[Member]		
7	Buildings [Member]	[Member]		
8	Furniture and Fixtures [Member]	[Member]		
9	Computer Equipment [Member]	[Member]		
10	Other Property, Plant and Equipment [Member]	[Member]		
11	**Property, Plant and Equipment, by Component [Line Items]**	[Line Items]		
12	*Property, Plant and Equipment, Net [Hierarchy]*	[Abstract]		
13	Property, Plant and Equipment, Net	[Concept] Monetary	As Of	Debit

20.25.4. Description

In this business use case the policies and the components of property, plant, and equipment are modelled in different [Table]s because they are presented in different areas of the report. However, the policies and the components of property, plant, and equipment are related, even though they are expressed for presentation purposes in a different area of a report.

When classes of something are modelled as [Member]s of an [Axis], it is easy to have two different sets of [Line Items] but still keep the relation between those [Line Items]. This allows for the alternative rendering to easily be created, combining these two separate sets of [Line Items].

By contrast, if two [Table]s have [Line Items] which are in fact related but there is nothing, such as an [Axis], a software application has no way of understanding that the two pieces are related.

20.25.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- Note that the policies and components [Table]s share the Class of Property, Plant and Equipment [Axis].
- Note that a software application could easily render the two sets of information as one set of [Line Items] should the user of this information prefer this organization.
- If there is nothing physically connecting different [Line Items] of different [Table]s a human reading the information my understand the relation, but a computer software application will not.

20.26. Grid

A *Grid* information model is a pseudo metapattern which uses the presentation characteristics of the columns and rows of a table to model information. Because the grid models presentation information and not business semantics, it cannot be considered a metapattern. However, the grid is included in this list because the US GAAP Taxonomy uses a grid information model to model the statement of changes in equity. A grid is more of a technique for presenting information than a business use case. The metapattern of this business use case is the **grid** (pseudo metapattern).

20.26.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	Common Stock	Additional Paid-in Capital	Retained Earnings (Accumulated Deficit)	Equity
Balance at December 31, 2009	150,000	50,000	200,000	400,000
Net Income (Loss)			200,000	200,000
Dividends			-100,000	-100,000
Common Stock Issued	25,000	25,000		50,000
Balance at December 31, 2010	175,000	75,000	300,000	550,000

20.26.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	90000 - Statement of Changes in Equity (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Grid/StatementOfChangesInEquity)
Table	Statement of Changes in Equity [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Period [Axis]	2010-01-01 - 2010-12-31
Legal Entity [Axis]	Consolidated Entity [Member]

Statement of Changes in Equity [Line Items]	Equity Component [Axis]			
	Common Stock [Member]	Additional Paid -in Capital [Member]	Retained Earnings (Accumulated Deficit) [Member]	Equity [Member]
Statement of Changes in Equity [Grid]				
Equity, Beginning Balance	150,000	50,000	200,000	400,000
Net Income (Loss)			200,000	200,000
Dividends			(100,000)	(100,000)
Common Stock Issued	25,000	25,000		50,000
Equity, Ending Balance	175,000	75,000	300,000	550,000

20.26.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	90000 - Statement of Changes in Equity (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Grid/StatementOfChangesInEquity)
Table	Statement of Changes in Equity [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Statement of Changes in Equity [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Equity Component [Axis]**	[Axis]		
5	Equity [Member]	[Member]		
6	Common Stock [Member]	[Member]		
7	Additional Paid-in Capital [Member]	[Member]		
8	Retained Earnings (Accumulated Deficit) [Member]	[Member]		
9	**Statement of Changes in Equity [Line Items]**	[Line Items]		
10	*Statement of Changes in Equity [Grid]*	[Abstract]		
11	Equity, Beginning Balance	[Concept] Monetary	As Of	Credit
12	Net Income (Loss)	[Concept] Monetary	For Period	Credit
13	Dividends	[Concept] Monetary	For Period	Debit
14	Common Stock Issued	[Concept] Monetary	For Period	Credit
15	Equity, Ending Balance	[Concept] Monetary	As Of	Credit

20.26.4. Description

With the *Grid* pseudo metapattern, each of the columns of the presentation identified and articulated as a [Member] of an [Axis]. In this business use case the [Axis] is "Equity Component [Axis]" which has four [Member]s as there are four columns. The [Line Items] indicate the rows of the grid. In this case the rows are actually a roll forward. The cells of the grid represent intersections of the columns [Axis] and the [Line Items].

20.26.5. Important distinguishing aspects and dynamics

While the grid pseudo metapattern makes for easy rendering of information, it has to very significant negative aspects. Clues of these negative aspects become clear by closely examining the fact table of this business use case.

- The Equity Component [Axis] which is generally unique to the [Table] the grid is modelling causes duplication of concepts. For example, the "Net Income (Loss)" which will likely appear in other locations in a report such as a financial statement have either the "Equity [Member]" or "Retained Earnings (Accumulated Deficit) [Member]" characteristics of the "Equity Component [Axis]". This causes these concept to not fit elsewhere in a report.
- A second negative side effect is that the [Line Items] concept which is used is used in every column. For example, the "Net Income (Loss)" concept is used in all columns where "Net Income (Loss)" appears. However, in a financial statement the concepts would actually be different. For example if a report contained a noncontrolling interest the net income concepts would be: Net Income (Loss) Applicable to Parent, Net Income (Loss) Attributable to Noncontrolling Interest, and Net Income (Loss) (i.e. the total including the portion attributable to the parent plus the portion attributable to the noncontrolling interest).
- Note the XBRL Formulas used to verify the computations of the information, in particular the second formula.

The following is a screen shot of the fact table for the information in this report where you can see the impact of the Equity Component [Axis] on the facts:

Component: (Network and Table)	
Network	90000 - Statement of Changes in Equity (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Grid/StatementOfChangesInEquity)
Table	Statement of Changes in Equity [Table]

#	Reporting Entity	Period	Legal Entity [Axis]	Equity Component [Axis]	Concept	Value
1	SAMP (http://www.SampleCompany.com)	2010-01-01 - 2010-12-31	Consolidated Entity [Member]	Equity [Member]	Dividends	100000
2	SAMP (http://www.SampleCompany.com)	2010-01-01 - 2010-12-31	Consolidated Entity [Member]	Retained Earnings (Accumulated Deficit) [Member]	Dividends	100000
3	SAMP (http://www.SampleCompany.com)	2010-01-01 - 2010-12-31	Consolidated Entity [Member]	Equity [Member]	Common Stock Issued	50000
4	SAMP (http://www.SampleCompany.com)	2010-01-01 - 2010-12-31	Consolidated Entity [Member]	Common Stock [Member]	Common Stock Issued	25000
5	SAMP (http://www.SampleCompany.com)	2010-01-01 - 2010-12-31	Consolidated Entity [Member]	Additional Paid-in Capital [Member]	Common Stock Issued	25000
6	SAMP (http://www.SampleCompany.com)	2010-01-01 - 2010-12-31	Consolidated Entity [Member]	Equity [Member]	Net Income (Loss)	200000
7	SAMP (http://www.SampleCompany.com)	2010-01-01 - 2010-12-31	Consolidated Entity [Member]	Retained Earnings (Accumulated Deficit) [Member]	Net Income (Loss)	200000
8	SAMP (http://www.SampleCompany.com)	2009-12-31	Consolidated Entity [Member]	Equity [Member]	Equity	400000
9	SAMP (http://www.SampleCompany.com)	2010-12-31	Consolidated Entity [Member]	Equity [Member]	Equity	550000
10	SAMP (http://www.SampleCompany.com)	2009-12-31	Consolidated Entity [Member]	Common Stock [Member]	Equity	150000
11	SAMP (http://www.SampleCompany.com)	2010-12-31	Consolidated Entity [Member]	Common Stock [Member]	Equity	175000
12	SAMP (http://www.SampleCompany.com)	2009-12-31	Consolidated Entity [Member]	Additional Paid-in Capital [Member]	Equity	50000
13	SAMP (http://www.SampleCompany.com)	2010-12-31	Consolidated Entity [Member]	Additional Paid-in Capital [Member]	Equity	75000
14	SAMP (http://www.SampleCompany.com)	2009-12-31	Consolidated Entity [Member]	Retained Earnings (Accumulated Deficit) [Member]	Equity	200000
15	SAMP (http://www.SampleCompany.com)	2010-12-31	Consolidated Entity [Member]	Retained Earnings (Accumulated Deficit) [Member]	Equity	300000

20.27. Pivot table

The *Pivot Table* business use case shows how to model information which might commonly be used within an Excel pivot table. The metapattern of this business use case is the **hierarchy**.

20.27.1. Visual Example

Sample Company
For Period Ending December 31,
(thousands of dollars)

	2010	2009	2008
Sales, all Business Segments, all Geographic Areas	32,038	35,805	32,465
Breakdown by Business Segment:			
Pharmaceuticals	20,181	18,150	15,275
Generics	2,433	1,973	1,823
Consumer Health	6,675	6,514	5,752
Other Segments	2,749	9,168	9,615
Breakdown by Geographic Area:			
North America	10,214	12,649	10,137
Europe	11,901	10,374	10,396
Asia	5,639	4,371	3,210
Other regions	4,284	8,411	8,722

20.27.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Sales Analysis, Summary (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/PivotTable/SalesAnalysisSummary)
Table	Sales Analysis, Summary [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]
Business Segment [Axis]	Business Segments, All [Member]
Geographic Area [Axis]	Geographic Areas, All [Member]

Sales Analysis, Summary [Line Items]	Period [Axis]		
	2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31	2008-01-01 - 2008-12-31
Sales Analysis, Summary [Hierarchy]			
Sales	32,038,000	35,805,000	32,465,000

Component: (Network and Table)	
Network	Sales Analysis, by Business Segment (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/PivotTable/SalesAnalysisByBusinessSegment)
Table	Sales Analysis, by Business Segment [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]
Geographic Area [Axis]	Geographic Areas, All [Member]

Sales Analysis, by Business Segment [Line Items]	Period [Axis]														
	2010-01-01 - 2010-12-31					2009-01-01 - 2009-12-31					2008-01-01 - 2008-12-31				
	Business Segment [Axis]					Business Segment [Axis]					Business Segment [Axis]				
	Pharmaceuticals Segment [Member]	Generics Segment [Member]	Consumer Health Segment [Member]	Other Segments [Member]	Business Segments, All [Member]	Pharmaceuticals Segment [Member]	Generics Segment [Member]	Consumer Health Segment [Member]	Other Segments [Member]	Business Segments, All [Member]	Pharmaceuticals Segment [Member]	Generics Segment [Member]	Consumer Health Segment [Member]	Other Segments [Member]	Business Segments, All [Member]
Sales Analysis, by Business Segment [Hierarchy]															
Sales	20,181,000	2,433,000	6,675,000	2,749,000	32,038,000	18,150,000	1,973,000	6,514,000	9,168,000	35,805,000	15,275,000	1,823,000	5,752,000	9,615,000	32,465,000

Component: (Network and Table)	
Network	Sales Analysis, by Geographic Area (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/PivotTable/SalesAnalysisByGeographicArea)
Table	Sales Analysis, by Geographic Area [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]
Business Segment [Axis]	Business Segments, All [Member]

Sales Analysis, by Geographic Area [Line Items]	Period [Axis]														
	2010-01-01 - 2010-12-31					2009-01-01 - 2009-12-31					2008-01-01 - 2008-12-31				
	Geographic Area [Axis]					Geographic Area [Axis]					Geographic Area [Axis]				
	North America Region [Member]	Europe Region [Member]	Asia Region [Member]	Other Regions [Member]	Geographic Areas, All [Member]	North America Region [Member]	Europe Region [Member]	Asia Region [Member]	Other Regions [Member]	Geographic Areas, All [Member]	North America Region [Member]	Europe Region [Member]	Asia Region [Member]	Other Regions [Member]	Geographic Areas, All [Member]
Sales Analysis, by Geographic Area [Hierarchy]															
Sales	10,214,000	11,901,000	5,639,000	4,284,000	32,038,000	12,649,000	10,374,000	4,371,000	8,411,000	35,805,000	10,137,000	10,396,000	3,210,000	8,722,000	32,465,000

20.27.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Sales Analysis, Summary (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/PivotTable/SalesAnalysisSummary)
Table	Sales Analysis, Summary [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Sales Analysis, Summary [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Business Segment [Axis]**	[Axis]		
5	Business Segments, All [Member]	[Member]		
6	**Geographic Area [Axis]**	[Axis]		
7	Geographic Areas, All [Member]	[Member]		
8	**Sales Analysis, Summary [Line Items]**	[Line Items]		
9	*Sales Analysis, Summary [Hierarchy]*	[Abstract]		
10	Sales	[Concept] Monetary	For Period	Credit

Component: (Network and Table)	
Network	Sales Analysis, by Business Segment (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/PivotTable/SalesAnalysisByBusinessSegment)
Table	Sales Analysis, by Business Segment [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Sales Analysis, by Business Segment [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Business Segment [Axis]**	[Axis]		
5	Business Segments, All [Member]	[Member]		
6	Pharmaceuticals Segment [Member]	[Member]		
7	Generics Segment [Member]	[Member]		
8	Consumer Health Segment [Member]	[Member]		
9	Other Segments [Member]	[Member]		
10	**Geographic Area [Axis]**	[Axis]		
11	Geographic Areas, All [Member]	[Member]		
12	**Sales Analysis, by Business Segment [Line Items]**	[Line Items]		
13	*Sales Analysis, by Business Segment [Hierarchy]*	[Abstract]		
14	Sales	[Concept] Monetary	For Period	Credit

Component: (Network and Table)	
Network	Sales Analysis, by Geographic Area (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/PivotTable/SalesAnalysisByGeographicArea)
Table	Sales Analysis, by Geographic Area [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Sales Analysis, by Geographic Area [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Business Segment [Axis]**	[Axis]		
5	Business Segments, All [Member]	[Member]		
6	**Geographic Area [Axis]**	[Axis]		
7	Geographic Areas, All [Member]	[Member]		
8	North America Region [Member]	[Member]		
9	Europe Region [Member]	[Member]		
10	Asia Region [Member]	[Member]		
11	Other Regions [Member]	[Member]		
12	**Sales Analysis, by Geographic Area [Line Items]**	[Line Items]		
13	*Sales Analysis, by Geographic Area [Hierarchy]*	[Abstract]		
14	Sales	[Concept] Monetary	For Period	Credit

20.27.4. Description

The *Pivot Table* business use case shows information which might commonly populate an electronic spread sheet pivot table. The one concept is expressed with characteristics which indicate which business segment and which geographic area that sales fact value relates to. This is done using the Business Segment [Axis] and Geographic Area [Axis] to differentiate the facts.

20.27.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- In a spread sheet pivot table totals are generally not provided, rather the pivot table computes the totals as needed. However, in this example the totals are provided.
- Alternatively, this information could have been modelled as all concepts, rather than using the [Axis] to express the business segment and geographic area. However doing so would make the pivot table less usable. Note the *Class* business use case as contrast to the *Roll Up* business use case.
- Notice that there are three sections of this report: totals, a business segment breakdown, and a geographic area breakdown. Each of these is articulated in different [Table]s of information. Alternatively, one single [Table] could have been used; however, it would be less clear that two breakdowns were required.
- Notice that the [Table]s are not in the desired order in the relations rendering. This is because the software application is using the alphabetic order of the label of each network to determine the ordering or sequencing of the network. Note the Flow business use case in contrast which shows how to add an ordering of networks and/or [Table]s.

20.28. Grouped report

The *Grouped Report* business use case is a variation of the *Compound Fact* use case which uses a large number of [Axis]. As such, what this use case shows is complexity in the area of [Axis]. It also introduces the notion of groupings or levels within a report which summarizes information. The metapattern of this business use case is the **hierarchy**.

20.28.1. Visual Example

Sample Company
For Period Ending December 31, 2010
Investments

Shares	Description	Moody's Rating	S & P Rating	Value
SHORT-TERM INVESTMENTS				
Singapore				
SGD				
Software				
	Microcom			
11,500	11500000	A1	A+	12,993,736
5,000	5000000	Aa3	A-	5,662,500
Telecoms				
	Cable and Wireless Optus Finance			
5,800	5800000	A2	A+	6,857,321
			Total Singapore	**25,513,557**
			Total Short-Term Investments	**25,513,557**
			Total Investments	**25,513,557**

20.28.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Portfolio of Investments (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/GroupedReport/PortfolioOfInvestments)
Table	Portfolio of Investments [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Period [Axis]	2010-12-31
Legal Entity [Axis]	Consolidated Entity [Member]

		Investment Type [Axis]			
		Telecoms [Member]	Software [Member]	All Types [Member]	
		Investment Country [Axis]	Investment Country [Axis]	Investment Country [Axis]	
		Singapore [Member]	Singapore [Member]	Singapore [Member]	All Countries [Member]
		Investment Entity [Axis]	Investment Entity [Axis]	Investment Entity [Axis]	Investment Entity [Axis]
Investment Term [Axis]	Investments [Line Items]	Cable and Wireless Optus Finance [Member]	Microcom [Member]	All Entities [Member]	All Entities [Member]
Short-Term Investment [Member]	**Investment [Hierarchy]**				
	Investment Description	3.00% 3/25/09	3.50% 12/7/04		
	Moody Rating	A2	A1		
	Standard and Poor Rating	A+	A+		
	Investment Shares	5,800,000	11,500,000	22,300,000	22,300,000
	Investment Value, at Cost	6,857,321	12,993,736	25,513,557	25,513,557
All Terms [Member]	**Investment [Hierarchy]**				
	Investment Description				
	Moody Rating				
	Standard and Poor Rating				
	Investment Shares				22,300,000
	Investment Value, at Cost				25,513,557

20.28.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Portfolio of Investments (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/GroupedReport/PortfolioOfInvestments)
Table	Portfolio of Investments [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Portfolio of Investments [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Investment Term [Axis]**	[Axis]		
5	All Terms [Member]	[Member]		
6	Short-Term Investment [Member]	[Member]		
7	**Investment Type [Axis]**	[Axis]		
8	All Types [Member]	[Member]		
9	Telecoms [Member]	[Member]		
10	Software [Member]	[Member]		
11	**Investment Country [Axis]**	[Axis]		
12	All Countries [Member]	[Member]		
13	Singapore [Member]	[Member]		
14	Australia [Member]	[Member]		
15	**Investment Entity [Axis]**	[Axis]		
16	All Entities [Member]	[Member]		
17	EFIC [Member]	[Member]		
18	Cable and Wireless Optus Finance [Member]	[Member]		
19	Microcom [Member]	[Member]		
20	**Investments [Line Items]**	[Line Items]		
21	*Investment [Hierarchy]*	[Abstract]		
22	Investment Description	[Concept] String	As Of	
23	Moody Rating	[Concept] String	As Of	
24	Standard and Poor Rating	[Concept] String	As Of	
25	Investment Shares	[Concept] Shares	As Of	
26	Investment Value, at Cost	[Concept] Monetary	As Of	Debit

20.28.4. Description

The *Grouped Report* business use cases shows that additional characteristics can be provided for an information set in the form of one or more [Axis]. In this use case five [Axis] are used to communicate characteristics of the information set. Other characteristics, such as the ratings in this case, are articulated as concepts within the set of [Line Items]. Where these characteristics are modelled does impact how the information can be used.

Also notice the visualization of the example, consider how the information is grouped. While this business use case shows only a few report rows, there could be a long list of items being reported and multiple grouping levels based on the different [Axis] or even the [Line Items].

20.28.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- The *Grouped Report* business use case simply shows a [Table] which has a larger number of [Axis].
- Nothing is really complicated about the use case as compared to other use cases other than the large number of [Axis] which are used to characterize the investment information.

- A choice needs to be made in many cases to determine if information should be modelled as an [Axis] or as a concept within the set of [Line Items]. For example, in this case the Moody Rating and Standard and Poor Rating might have been modelled as an [Axis]. Likewise the Investment Description could have been modelled as an [Axis].
- Monetary values such as Investment Shares and Investment Value, at Cost would never be modelled as an [Axis] generally.
- Where things are modelled impacts how they are treated by a rendering application.

20.29. Flow

The *Flow* business use case models how to articulate the sequence or ordering of information within a financial report. Notice that this visual example has three sections: Total Sales, Sales by Business Segment, and Sales by Geographic Area. Flow has to do with putting these three components into the appropriate order or sequence. Any metapattern can have flow. The metapattern of this business use case is the **hierarchy**.

20.29.1. Visual Example

Sample Company
For Period Ending December 31,
(thousands of dollars)

	2010	2009	2008
Sales, all Business Segments, all Geographic Areas	32,038	35,805	32,465
Breakdown by Business Segment:			
Pharmaceuticals	20,181	18,150	15,275
Generics	2,433	1,973	1,823
Consumer Health	6,675	6,514	5,752
Other Segments	2,749	9,168	9,615
Breakdown by Geographic Area:			
North America	10,214	12,649	10,137
Europe	11,901	10,374	10,396
Asia	5,639	4,371	3,210
Other regions	4,284	8,411	8,722

20.29.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	1001 - Table - Sales Analysis, Summary (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Flow/SalesAnalysisSummary)
Table	Sales Analysis, Summary [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]
Business Segment [Axis]	Business Segments, All [Member]
Geographic Area [Axis]	Geographic Areas, All [Member]

Sales Analysis, Summary [Line Items]	Period [Axis]		
	2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31	2008-01-01 - 2008-12-31
Sales Analysis, Summary [Hierarchy]			
Sales	32,038,000	35,805,000	32,465,000

Component: (Network and Table)	
Network	2001 - Table - Sales Analysis, by Geographic Area (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Flow/SalesAnalysisByGeographicArea)
Table	Sales Analysis, by Geographic Area [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]
Business Segment [Axis]	Business Segments, All [Member]

Sales Analysis, by Geographic Area [Line Items]	Period [Axis]														
	2010-01-01 - 2010-12-31					2009-01-01 - 2009-12-31					2008-01-01 - 2008-12-31				
	Geographic Area [Axis]					Geographic Area [Axis]					Geographic Area [Axis]				
	North America Region [Member]	Europe Region [Member]	Asia Region [Member]	Other Regions [Member]	Geographic Areas, All [Member]	North America Region [Member]	Europe Region [Member]	Asia Region [Member]	Other Regions [Member]	Geographic Areas, All [Member]	North America Region [Member]	Europe Region [Member]	Asia Region [Member]	Other Regions [Member]	Geographic Areas, All [Member]
Sales Analysis, by Geographic Area [Hierarchy]															
Sales	10,214,000	11,901,000	5,639,000	4,284,000	32,038,000	12,649,000	10,374,000	4,371,000	8,411,000	35,805,000	10,137,000	10,396,000	3,210,000	8,722,000	32,465,000

Component: (Network and Table)	
Network	3001 - Table - Sales Analysis, by Business Segment (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Flow/SalesAnalysisByBusinessSegment)
Table	Sales Analysis, by Business Segment [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]
Geographic Area [Axis]	Geographic Areas, All [Member]

Sales Analysis, by Business Segment [Line Items]	Period [Axis]														
	2010-01-01 - 2010-12-31					2009-01-01 - 2009-12-31					2008-01-01 - 2008-12-31				
	Business Segment [Axis]					Business Segment [Axis]					Business Segment [Axis]				
	Pharmaceuticals Segment [Member]	Generics Segment [Member]	Consumer Health Segment [Member]	Other Segments [Member]	Business Segments, All [Member]	Pharmaceuticals Segment [Member]	Generics Segment [Member]	Consumer Health Segment [Member]	Other Segments [Member]	Business Segments, All [Member]	Pharmaceuticals Segment [Member]	Generics Segment [Member]	Consumer Health Segment [Member]	Other Segments [Member]	Business Segments, All [Member]
Sales Analysis, by Business Segment [Hierarchy]															
Sales	20,181,000	2,433,000	6,675,000	2,749,000	32,038,000	18,150,000	1,973,000	6,514,000	9,168,000	35,805,000	15,275,000	1,823,000	5,752,000	9,615,000	32,465,000

20.29.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	1001 - Table - Sales Analysis, Summary (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Flow/SalesAnalysisSummary)
Table	Sales Analysis, Summary [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Sales Analysis, Summary [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Business Segment [Axis]**	[Axis]		
5	Business Segments, All [Member]	[Member]		
6	**Geographic Area [Axis]**	[Axis]		
7	Geographic Areas, All [Member]	[Member]		
8	**Sales Analysis, Summary [Line Items]**	[Line Items]		
9	*Sales Analysis, Summary [Hierarchy]*	[Abstract]		
10	Sales	[Concept] Monetary	For Period	Credit

Component: (Network and Table)	
Network	2001 - Table - Sales Analysis, by Geographic Area (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Flow/SalesAnalysisByGeographicArea)
Table	Sales Analysis, by Geographic Area [Table]

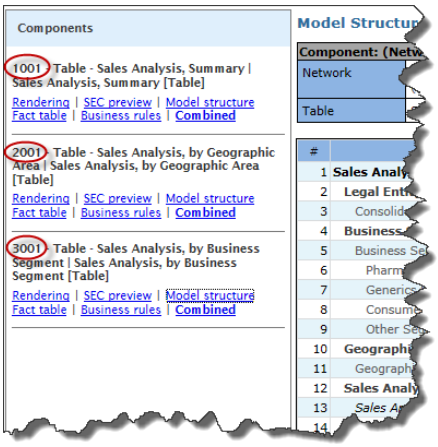
#	Label	Report Element Class	Period Type	Balance
1	**Sales Analysis, by Geographic Area [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Business Segment [Axis]**	[Axis]		
5	Business Segments, All [Member]	[Member]		
6	**Geographic Area [Axis]**	[Axis]		
7	Geographic Areas, All [Member]	[Member]		
8	North America Region [Member]	[Member]		
9	Europe Region [Member]	[Member]		
10	Asia Region [Member]	[Member]		
11	Other Regions [Member]	[Member]		
12	**Sales Analysis, by Geographic Area [Line Items]**	[Line Items]		
13	*Sales Analysis, by Geographic Area [Hierarchy]*	[Abstract]		
14	Sales	[Concept] Monetary	For Period	Credit

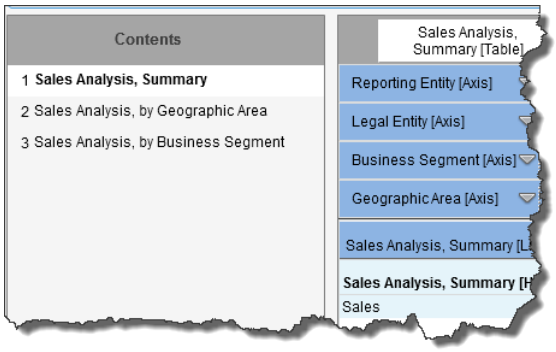
Component: (Network and Table)	
Network	3001 - Table - Sales Analysis, by Business Segment (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Flow/SalesAnalysisByBusinessSegment)
Table	Sales Analysis, by Business Segment [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Sales Analysis, by Business Segment [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Business Segment [Axis]**	[Axis]		
5	Business Segments, All [Member]	[Member]		
6	Pharmaceuticals Segment [Member]	[Member]		
7	Generics Segment [Member]	[Member]		
8	Consumer Health Segment [Member]	[Member]		
9	Other Segments [Member]	[Member]		
10	**Geographic Area [Axis]**	[Axis]		
11	Geographic Areas, All [Member]	[Member]		
12	**Sales Analysis, by Business Segment [Line Items]**	[Line Items]		
13	*Sales Analysis, by Business Segment [Hierarchy]*	[Abstract]		
14	Sales	[Concept] Monetary	For Period	Credit

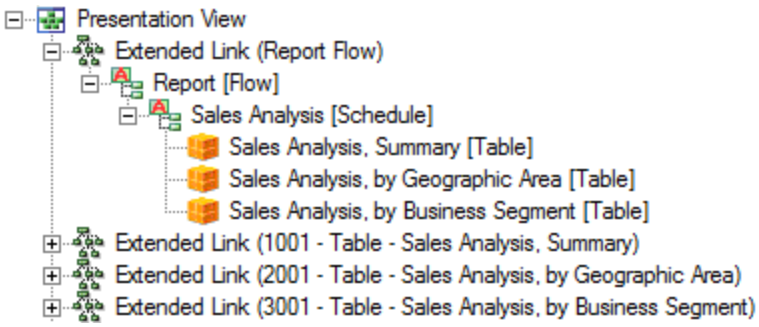
20.29.4. Description

The *Flow* business use case shows that financial reports have an ordering or sequence and how to model that sequence within an XBRL taxonomy by creating what amounts to a hierarchy of [Tables]. Here you see two software applications which order the three networks used within this business use case:





Expressing the hierarchy of [Table]s can be achieved using a number of approaches. Using the diagram below we will explain the approaches.



The first approach is used by the US GAAP Taxonomy and ordering is achieved by adding a "number" and a "category" to the network label. In the screen shot above see the last three items within the presentation view tree. A software application can order the networks using the numbers, the category, or any part of the label.

The second approach, used in this example, shows a hierarchy of [Table]s expressed within the presentation view within a separate network. You can see this above in the "Report Flow" network. In this example the list is flat, but it could be a nested hierarchy.

The screen shot below shows an application which utilizes the network numbers to organize the networks. The selected network and [Table] is selected on the left and displayed in the software application on the right.

20.29.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- There is no standard approach to expressing the specific ordering or sequence within a financial report.
- One approach to expressing an ordering or sequence is to add a number and category to a network label. If the application supports that approach, the number and category can be used for ordering/sequencing.
- Another approach is to express a hierarchy of [Table]s within the presentation or definition linkbase. This is not a standard approach, however it can be effective and provide a nested hierarchy. Note that networks cannot be nested.
- Contrast this use case with the *Pivot Table* use case which does not provide the flow information, but all other aspects of the use case are the same.

20.30. Restatement

The *Restatement* business use case shows how to model an accounting restatement due to a change in accounting policy or the correction of an error. It also points out the notion of integrity between [Table]s within a financial report. The metapattern of this business use case is the **roll forward**, **roll up**, and **adjustment**.

20.30.1. Visual Example

Sample Company
December 31,
(dollars)

	2010	2009 (Restated)
Balance Sheet (Fragment)		
Equity		
Common Stock	5,000,000	5,000,000
Retained Earnings	10,850,000	10,700,000
Total Equity	15,850,000	15,700,000

	2010	2009 (Restated)	2009 (Previous)
Income Statement (Fragment)			
Gross Sales	1,500,000	1,000,000	*1,000,000*
Cost of sales	500,000	200,000	*200,000*
Net sales	1,000,000	800,000	*800,000*
Operating expenses (*)	350,000	1,600,000	*300,000*
	650,000	-800,000	*500,000*
Net income (loss)			

Statement of Changes in Equity (Fragment)	2010	2009
Prior Period Adjustment		
Retained Earnings (Accumulated Losses), Originally Stated 2009	12,000,000	
Change in Accounting Policy	0	
Correction of an Error	-1,300,000	
Retained Earnings (Accumulated Losses), Restated 2009 Beginning Balance	10,700,000	
Changes in Equity		
Retained Earnings (Accumulated Losses), Beginning Balance	10,700,000	12,300,000
Net Income (Loss)	650,000	-800,000
Dividends	-500,000	-800,000
Retained Earnings (Accumulated Losses), Ending Balance	10,850,000	10,700,000

20.30.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Balance Sheet (Fragnent) (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Restatement/BalanceSheet)
Table	Balance Sheet [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Balance Sheet [Line Items]	Report Date [Axis]	Period [Axis]		
		2010-12-31	2009-12-31	2008-12-31
Common Stock	Reported March 18, 2011 [Member]	5,000,000	5,000,000	
Retained Earnings (Accumulated Losses)	Reported March 18, 2011 [Member]	10,850,000	10,700,000	12,300,000
Equity	Reported March 18, 2011 [Member]	15,850,000	15,700,000	

Component: (Network and Table)	
Network	Income Statement (Fragnent) (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Restatement/IncomeStatement)
Table	Income Statement [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Income Statement [Line Items]	Report Date [Axis]	Period [Axis]	
		2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31
Sales, Gross	Reported March 18, 2011 [Member]	1,500,000	1,000,000
Cost of Sales	Reported March 18, 2011 [Member]	500,000	200,000
Sales, Net	Reported March 21, 2010 [Member]		800,000
	Reported March 18, 2011 [Member]	1,000,000	800,000
Operating Expenses	Reported March 21, 2010 [Member]		300,000
	Reported March 18, 2011 [Member]	350,000	1,600,000
Net Income (Loss)	Reported March 21, 2010 [Member]		500,000
	Reported March 18, 2011 [Member]	650,000	(800,000)

Component: (Network and Table)	
Network	Prior Period Adjustments (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Restatement/PriorPeriodAdjustments)
Table	Prior Period Adjustments [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Prior Period Adjustments [Line Items]	Report Date [Axis]	Period [Axis]		
		2010-12-31	2009-12-31	2008-12-31
Retained Earnings (Accumulated Losses), Origionally Stated	Reported March 21, 2010 [Member]		12,000,000	
Changes in Accounting Policy	Reported March 18, 2011 [Member]		0	
Correction of an Error	Reported March 18, 2011 [Member]		(1,300,000)	
Changes in Accounting Policy	Reported March 18, 2011 [Member]		(1,300,000)	
Retained Earnings (Accumulated Losses), Restated	Reported March 18, 2011 [Member]	10,850,000	10,700,000	12,300,000

Component: (Network and Table)	
Network	Changes in Equity (Fragment) (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Restatement/ChangesInEquity)
Table	Changes in Equity [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Changes in Equity [Line Items]	Report Date [Axis]	Period [Axis]	
		2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31
Retained Earnings (Accumulated Losses), Beginning Balance	Reported March 21, 2010 [Member]	12,000,000	
	Reported March 18, 2011 [Member]	10,700,000	12,300,000
Net Income (Loss)	Reported March 21, 2010 [Member]		500,000
	Reported March 18, 2011 [Member]	650,000	(800,000)
Dividends Paid	Reported March 18, 2011 [Member]	500,000	800,000
Retained Earnings (Accumulated Losses), Period Increase (Decrease), Total	Reported March 18, 2011 [Member]	150,000	(1,600,000)
Retained Earnings (Accumulated Losses), Ending Balance	Reported March 21, 2010 [Member]		12,000,000
	Reported March 18, 2011 [Member]	10,850,000	10,700,000

20.30.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Balance Sheet (Fragnent) (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Restatement/BalanceSheet)
Table	Balance Sheet [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Balance Sheet [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Report Date [Axis]**	[Axis]		
5	Report Dates, All [Member]	[Member]		
6	Reported March 18, 2011 [Member]	[Member]		
7	**Balance Sheet [Line Items]**	[Line Items]		
8	*Equity [Roll Up]*	[Abstract]		
9	Common Stock	[Concept] Monetary	As Of	Credit
10	Retained Earnings (Accumulated Losses)	[Concept] Monetary	As Of	Credit
11	Equity	[Concept] Monetary	As Of	Credit

Component: (Network and Table)	
Network	Income Statement (Fragnent) (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Restatement/IncomeStatement)
Table	Income Statement [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Income Statement [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Report Date [Axis]**	[Axis]		
5	Report Dates, All [Member]	[Member]		
6	Reported March 21, 2010 [Member]	[Member]		
7	Reported March 18, 2011 [Member]	[Member]		
8	**Income Statement [Line Items]**	[Line Items]		
9	*Net Income (Loss) [Roll Up]*	[Abstract]		
10	*Sales, Net [Roll Up]*	[Abstract]		
11	Sales, Gross	[Concept] Monetary	For Period	Credit
12	Cost of Sales	[Concept] Monetary	For Period	Debit
13	Sales, Net	[Concept] Monetary	For Period	Credit
14	Operating Expenses	[Concept] Monetary	For Period	Debit
15	Net Income (Loss)	[Concept] Monetary	For Period	Credit

Component: (Network and Table)	
Network	Changes in Equity (Fragment) (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Restatement/ChangesInEquity)
Table	Changes in Equity [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Changes in Equity [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Report Date [Axis]**	[Axis]		
5	Report Dates, All [Member]	[Member]		
6	Reported March 21, 2010 [Member]	[Member]		
7	Reported March 18, 2011 [Member]	[Member]		
8	**Changes in Equity [Line Items]**	[Line Items]		
9	*Changes in Retained Earnings [Roll Forward]*	[Abstract]		
10	Retained Earnings (Accumulated Losses), Beginning Balance	[Concept] Monetary	As Of	Credit
11	*Retained Earnings (Accumulated Losses), Period Increase (Decrease), Total [Roll Up]*	[Abstract]		
12	Net Income (Loss)	[Concept] Monetary	For Period	Credit
13	Dividends Paid	[Concept] Monetary	For Period	Debit
14	Retained Earnings (Accumulated Losses), Period Increase (Decrease), Total	[Concept] Monetary	For Period	Credit
15	Retained Earnings (Accumulated Losses), Ending Balance	[Concept] Monetary	As Of	Credit

Component: (Network and Table)	
Network	Prior Period Adjustments (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Restatement/PriorPeriodAdjustments)
Table	Prior Period Adjustments [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Prior Period Adjustments [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Report Date [Axis]**	[Axis]		
5	Report Dates, All [Member]	[Member]		
6	Reported March 21, 2010 [Member]	[Member]		
7	Reported March 18, 2011 [Member]	[Member]		
8	**Prior Period Adjustments [Line Items]**	[Line Items]		
9	*Prior Period Adjustments to Retained Earnings [Adjustment]*	[Abstract]		
10	Retained Earnings (Accumulated Losses), Origionally Stated	[Concept] Monetary	As Of	Credit
11	*Prior Period Adjustments, Period Increase (Decrease), Total [Roll Up]*	[Abstract]		
12	Changes in Accounting Policy	[Concept] Monetary	As Of	Credit
13	Correction of an Error	[Concept] Monetary	As Of	Credit
14	Changes in Accounting Policy	[Concept] Monetary	As Of	Credit
15	Retained Earnings (Accumulated Losses), Restated	[Concept] Monetary	As Of	Credit

20.30.4. Description

The *Restatement* business use case shows how to model an accounting restatement due to a prior period adjustment from an accounting error or a change in accounting policy. Also see the *Adjustment* business use case.

Note that the balance sheet is a *Roll Up* as is the income statement. The prior period adjustment is an *Adjustment* metapattern. The changes in equity is a *Roll Forward*.

The different [Table]s need to properly relate to one another just like components of a financial statement need to properly tie together.

20.30.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- Note the *Roll Up*, *Roll Forward*, and *Adjustment* business use cases for detailed information about those specific use cases. This use case points out how different components relate to one another.
- Notice how the moving pieces of this use case impact multiple areas of the financial report shown in this use case namely the balance sheet, income statement, and the statement of changes in equity.
- The [Axis] used on each [Table] are logical and the different facts properly relate to one another.
- Facts in the XBRL instance are not duplicated. Net Income (Loss), for example, appears on both the income statement and in the statement of changes in equity. Likewise, Retained Earnings (Accumulated Losses) appears on both the balance sheet and the statement of changes in equity.
- The prior period adjustment and the changes in equity are modelled in separate [Table]s because the renderings have different slicers, columns and rows.

20.31. Reissue report

The *Reissue Report* business use case shows how to model the reissuance of a financial report for, say, a report which has been recalled because of a major problem. The metapattern of this business use case is the **roll up**. However, any metapattern could be reissued.

Additionally, the business rule used with this report models a roll up which makes use of a tolerance. (This has nothing to do with the reissue use case, the business rule simply shows that use case.)

20.31.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	2010	2009
ASSETS		
Property, Plant, and Equipment, Net		
Land	5,347	1,147
Buildings, Net	244,508	366,375
Furniture and Fixtures, Net	34,457	34,457
Computer Equipment, Net	4,169	5,313
Other Property, Plant, and Equipment, Net	6,702	6,149
Property, Plant and Equipment, Net, Total	295,183	413,441

COMMENTS:

(*). Reissued Report: This report has been reissued on March 2, 2011. The origional report issued on February 15, 2011 contained a significant mistake. The amounts for Land and Building were transposed.

20.31.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Property, Plant, and Equipment, by Component (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ReissueReport/PropertyPlantAndEquipmentByComponent)
Table	Property, Plant and Equipment, by Component [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]
Report Date [Axis]	Report as Of March 2, 2011 [Member]

Property, Plant and Equipment, by Component [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Property, Plant and Equipment, Net [Roll Up]		
Land	5,347,000 [1]	1,147,000
Buildings, Net	244,508,000 [1]	366,375,000
Furniture and Fixtures, Net	34,457,000	34,457,000
Computer Equipment, Net	4,169,000	5,313,000
Other Property, Plant and Equipment, Net	6,702,000	6,149,000
Property, Plant and Equipment, Net, Total	295,183,000	413,441,000

1: Reissued Report: This report has been reissued on March 2, 2011. The origional report issued on February 15, 2011 contained a significant mistake.

20.31.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Property, Plant, and Equipment, by Component (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/ReissueReport/PropertyPlantAndEquipmentByCor
Table	Property, Plant and Equipment, by Component [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Property, Plant and Equipment, by Component [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Report Date [Axis]**	[Axis]		
5	Report as Of March 2, 2011 [Member]	[Member]		
6	**Property, Plant and Equipment, by Component [Line Items]**	[Line Items]		
7	*Property, Plant and Equipment, Net [Roll Up]*	[Abstract]		
8	Land	[Concept] Monetary	As Of	Debit
9	Buildings, Net	[Concept] Monetary	As Of	Debit
10	Furniture and Fixtures, Net	[Concept] Monetary	As Of	Debit
11	Computer Equipment, Net	[Concept] Monetary	As Of	Debit
12	Other Property, Plant and Equipment, Net	[Concept] Monetary	As Of	Debit
13	Property, Plant and Equipment, Net, Total	[Concept] Monetary	As Of	Debit

20.31.4. Description

The *Reissue Report* business use case shows how the reissuance of a financial statement can be handled. Note that the entire report is reissued, resulting in a different report date. The report date is indicated by the Report Date [Axis]. This fragment is in all other ways the same as the Roll Up business use case.

20.31.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- Sometimes major errors are made and reports need to be reissued.
- Different regulators or others using reports could have different mechanisms for determining a report date. One common mechanism is the date of the audit, review, or compilation if a third party public accountant is involved with the report. For the SEC the filing date may be considered the report date.
- If data exists within a system used for analysis and a report is reissued, that system needs to be updated with the new report and could contain both the original report and the reissued report. Those reports need to be differentiated in some way.
- Note the business rule which models the roll up business rule using a tolerance.

20.32. Reclassification

The *Reclassification* business use case shows how to model information which was reported with one classification in a prior period but has been reclassified in a current report to conform to the current classifications of the information. This is a classic accounting reclassification of, say, balance sheet line items. The metapattern of this business use case is the **roll up**. However, any metapattern could be reissued.

20.32.1. Visual Example

Sample Company
December 31,
(thousands of dollars)

	2010	2009	*Previous 2009*
ASSETS			
Property, Plant, and Equipment, Net			
Land	5,347	1,147	*1,147*
Buildings, Net	244,508	366,375	*366,375*
Furniture and Fixtures, Net	34,457	34,457	*34,457*
Computer Equipment, Net	4,169	5,313	
Other Property, Plant, and Equipment, Net	6,702	6,149	*11,462*
Property, Plant and Equipment, Net, Total	295,183	413,441	*413,441*

POLICIES:

Prior period classifications have been restated to conform to current period classifications.

20.32.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Property, Plant, and Equipment, by Component (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Reclassification/PropertyPlantAnd
Table	Property, Plant and Equipment, by Component [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Property, Plant and Equipment, by Component [Line Items]	Report Date [Axis]	Period [Axis]	
		2010-12-31	2009-12-31
Land	Report as of March 2, 2011 [Member]	5,347,000	1,147,000
Buildings, Net	Report as of March 2, 2011 [Member]	244,508,000	366,375,000
Furniture and Fixtures, Net	Report as of March 2, 2011 [Member]	34,457,000	34,457,000
Computer Equipment, Net	Report as of March 2, 2011 [Member]	4,169,000	5,313,000
Other Property, Plant and Equipment, Net	Report as of March 2, 2011 [Member]	6,702,000	6,149,000
	Report as of February 18, 2010 [Member]		11,462,000
Property, Plant and Equipment, Net, Total	Report as of March 2, 2011 [Member]	295,183,000	413,441,000

20.32.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Property, Plant, and Equipment, by Component (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/Reclassification/PropertyPlantAndEquipmentByCo
Table	Property, Plant and Equipment, by Component [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Property, Plant and Equipment, by Component [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Report Date [Axis]**	[Axis]		
5	Report as of March 2, 2011 [Member]	[Member]		
6	Report as of February 18, 2010 [Member]	[Member]		
7	**Property, Plant and Equipment, by Component [Line Items]**	[Line Items]		
8	*Property, Plant and Equipment, Net [Roll Up]*	[Abstract]		
9	Land	[Concept] Monetary	As Of	Debit
10	Buildings, Net	[Concept] Monetary	As Of	Debit
11	Furniture and Fixtures, Net	[Concept] Monetary	As Of	Debit
12	Computer Equipment, Net	[Concept] Monetary	As Of	Debit
13	Other Property, Plant and Equipment, Net	[Concept] Monetary	As Of	Debit
14	Property, Plant and Equipment, Net, Total	[Concept] Monetary	As Of	Debit

20.32.4. Description

The *Reclassification* business use case shows how to handle an accounting type of reclassification. In this case, Other Property, Plant, and Equipment, Net previously reported as $11,462 in another report is broken out into its components for the prior period 2009 classification in order to be consistent with the current period 2010 classification. All other aspects of this business use case are the same as the Roll Up business use case.

20.32.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- Reported information is sometimes reclassified to match current classifications. These reclassifications must be identifiable in some way.
- A footnote could be used to identify reclassifications.
- The fact that a reclassification has been made to line items of a financial report is generally required, this use case is not attempting to address this requirement. This use case focuses on the dynamics of the facts which have been reported which have been reclassified.
- The amounts of reclassified line items is not required to be disclosed (the lighter grey facts), they are provided here only to help understand the use case.

20.33. Reason not reported

The *Reason Not Reported* business use case show how to model information which is required to be reported, but for some reason the information is not available, unknown, or for some other reason cannot be determined and therefore cannot be reported. The metapattern of this business use case is the **hierarchy**.

20.33.1. Visual Example

Sample Company
For Period Ending December 31,
(thousands of dollars, except number of employees)

	2010	2009	2008	2007	2006
Sales, Net	1,500	1,400	1,300	1,200	1,100
Income (Loss) from Continuing Operations	500	400	300	200	100
Net Income (Loss)	51	41	31	21	11
Cash Flow Provided by (used in) Operating Activities, Net	5,000	4,000	3,000	2,000	1,000
Capital Additions	1,000	650	550	450	350
Average Number of Employees (*****)	300	290	280	270	*****

(*****). Reason Not Reported: This information unavailable and therefore has not been reported.

20.33.2. Metapattern(s) employed

Component: (Network and Table)	
Network	Financial Highlights (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCases/ReasonNotReported/FinancialHighlights)
Table	Financial Highlights [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Legal Entity [Axis]	Consolidated Entity [Member]

Financial Highlights [Line Items]	Period [Axis]				
	2010-01-01 - 2010-12-31	2009-01-01 - 2009-12-31	2008-01-01 - 2008-12-31	2007-01-01 - 2007-12-31	2006-01-01 - 2006-12-31
Financial Highlights [Hierarchy]					
Sales, Net	1,500,000	1,400,000	1,300,000	1,200,000	1,100,000
Income (Loss) from Continuing Operations	500,000	400,000	300,000	200,000	100,000
Net Income (Loss)	51,000	41,000	31,000	21,000	11,000
Cash Flow Provided by (Used in) Operating Activities, Net	5,000,000	4,000,000	3,000,000	2,000,000	1,000,000
Capital Additions	1,000,000	650,000	550,000	450,000	350,000
Average Number of Employees	300	290	280	270	xsi:nil[1]

1: Reason Not Reported: This information unavailable and therefore has not been reported.

20.33.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Financial Highlights (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCases/ReasonNotReported/FinancialHighlights)
Table	Financial Highlights [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Financial Highlights [Table]**	[Table]		
2	**Legal Entity [Axis]**	[Axis]		
3	Consolidated Entity [Member]	[Member]		
4	**Financial Highlights [Line Items]**	[Line Items]		
5	*Financial Highlights [Hierarchy]*	[Abstract]		
6	Sales, Net	[Concept] Monetary	For Period	Credit
7	Income (Loss) from Continuing Operations	[Concept] Monetary	For Period	Credit
8	Net Income (Loss)	[Concept] Monetary	For Period	Credit
9	Cash Flow Provided by (Used in) Operating Activities, Net	[Concept] Monetary	For Period	Debit
10	Capital Additions	[Concept] Monetary	For Period	Debit
11	Average Number of Employees	[Concept] Decimal	For Period	

20.33.4. Description

The *Reason Not Reported* business use case shows how sometimes information for a fact might not be reportable. This is different than (a) actually reporting a value such as zero or (b) not providing the fact at all. Rather, in this use case a fact is reported but the fact has a NIL attribute value. There could be a variety of reasons as to why a NIL value was reported such as the information is unknown, the information is unavailable, the information is required to be reported by it is not applicable, or some other reason. An XBRL footnote is used to articulate the specific reason a NIL value was reported.

20.33.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- Someone counted 14 different reasons why a fact might be reported as NIL.
- A footnote is used to provide details as to why the information was not reported. Standardized categories or reasons could be created to make the footnote more useful.

20.34. Non financial information

The *Non-Financial Information* business use case is really nothing new, rather it makes the point that the business use cases cover not just financial information, but rather any information: financial or non-financial. This business use case is created using Lorem Ipsum (http://www.lipsum.com/) dummy text.

20.34.1. Visual Example

Lorem Ipsum Dolor Sit Amet
December 31, 2010

Fringilla Feugiat Magna	Pellentesque Habitant Morbi Tristique	MaurisTincidunt Cursus	Metus Viverra Sollicitudin	Suspendisse Vestibulum Augue
pattern:CurabiturPortaDapibusMember	1,000	1,000	1,000	1,000
pattern:AeneanConvallisSemMember	1,000	1,000	1,000	1,000
pattern:MalesuadaFamesMember	2,000	2,000	2,000	2,000

20.34.2. Basic Automated Semantic Rendering

Component: (Network and Table)	
Network	Risus Convallis Placerat (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/NonFinancialInformation/RisusConvallisPlacerat)
Table	Risus Convallis Placerat [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	SAMP (http://www.SampleCompany.com)
Period [Axis]	2010-01-01 - 2010-12-31
Litora Torquent [Axis]	Curabitur Fermentum Mattis [Member]

Risus Convallis Placerat [Line Items]	Malesuada Fames [Axis]		
	Curabitur Porta Dapibus [Member]	Aenean Convallis Sem [Member]	Malesuada Fames [Member]
Fringilla Feugiat Magna [Hierarchy]			
Pellentesque Habitant Morbi Tristique	1,000	1,000	2,000
MaurisTincidunt Cursus	1,000	1,000	2,000
Metus Viverra Sollicitudin	1,000	1,000	2,000
Suspendisse Vestibulum Augue	1,000	1,000	2,000

20.34.3. Report Elements and Model Structure

Component: (Network and Table)	
Network	Risus Convallis Placerat (http://www.xbrlsite.com/DigitalFinancialReporting/BusinessUseCase/NonFinancialInformation/RisusConvallisPlacerat)
Table	Risus Convallis Placerat [Table]

#	Label	Report Element Class	Period Type	Balance
1	**Risus Convallis Placerat [Table]**	[Table]		
2	**Litora Torquent [Axis]**	[Axis]		
3	Curabitur Fermentum Mattis [Member]	[Member]		
4	**Malesuada Fames [Axis]**	[Axis]		
5	Malesuada Fames [Member]	[Member]		
6	Curabitur Porta Dapibus [Member]	[Member]		
7	Aenean Convallis Sem [Member]	[Member]		
8	**Risus Convallis Placerat [Line Items]**	[Line Items]		
9	*Fringilla Feugiat Magna [Hierarchy]*	[Abstract]		
10	Pellentesque Habitant Morbi Tristique	[Concept] Monetary	For Period	
11	MaurisTincidunt Cursus	[Concept] Monetary	For Period	
12	Metus Viverra Sollicitudin	[Concept] Monetary	For Period	
13	Suspendisse Vestibulum Augue	[Concept] Monetary	For Period	

20.34.4. Description

The *Non-Financial Information* business use case is *Simple Compound Fact* business use case modelled with meaningless dummy placeholder text. The point is to show that there is nothing special necessary to model non-financial information in XBRL. Any non-financial use case can be modelled as the financial reporting examples shown. Information is simply text and numbers; whether it is financial or non-financial is not a consideration really.

20.34.5. Important distinguishing aspects and dynamics

The following is a summary of the important characteristics and dynamics of this business case which should be considered:

- This use case shows that there is no difference between modelling financial and non-financial information. Both are numbers and text used within a specific business domain.
- You can look at any of these business use cases and ignore the actual text you see and focus on the patterns and semantics of the relations which is more the focus of the business use cases.

21. Comprehensive Example

The comprehensive example takes the complete set of business use cases, puts them all into one XBRL taxonomy and XBRL instance "system", and tests how one part of an XBRL taxonomy and XBRL instance interrelates with other parts in one comprehensive digital financial report. This enables an XBRL instance and taxonomy to be evaluated holistically, being sure all the moving pieces interact correctly with one another. This example also shows this interaction.

Don't be deceived by its apparent simplicity of this example. It would be rare for a real XBRL instance to contain all that this example contains. While it might not look like a real financial report, the example looks enough like a real financial report to help grasp the true issues of expressing information using XBRL but small enough not to be overwhelming.

This example does have the simple and complex issues you would run up against while modeling a real financial report. This is a marvelous learning tool. It is an extremely useful testing tool. It is a valuable prototype to show how to get XBRL to do the things which you will find that you need XBRL to do within your system.

21.1. Overview of comprehensive example

The comprehensive example can be found at the following URL:

http://www.xbrlsite.com/DigitalFinancialReporting/ComprehensiveExample/2013-05-15

At that URL you will see an index page which is similar to the index pages of the metapatterns and business use cases and looks as follows:

Comprehensive Example (2012-09-30)

#	Item	Description
A.	Business use case name	**Comprehensive Example**
B.	Description	The Comprehensive Example takes the complete set of business use cases, puts them all into one XBRL taxonomy and XBRL instance, and shows how one part of an XBRL taxonomy and XBRL instance interrelates with other parts in one comprehensive digital financial report.
C.	Visual example	ABC Company, Inc. Financial Highlights (in US Dollars)
D.	Visual example file	PDF | XSLT used to generate XSL-FO for PDF generation
E.	XBRL taxonomy	XSD (Company) | XSD (GAAP)
F.	XBRL instance	XBRL instance
G.	XBRL formulas	XBRL Formulas (Company) | XBRL Formulas (GAAP domain level and Industry/activity level)
H.	Human readable viewer	Coming soon!
I.	ZIP Archieve with All Files	ZIP
J.	Automated validation results	XBRL validation (UBmatrix Taxonomy Designer) | XBRL validation (XBRL Cloud XRun) | XBRL validation (CoreFilings TrueNorth) | XBRL validation (XBRL Cloud) | XBRL validation (UBmatrix XPE) | XBRL calculations validation (UBmatrix Taxonomy Designer) | XBRL calculations validation (UBmatrix XPE) | XBRL Formula validation (UBmatrix XPE)

	2010	2009	2008	2007	2006
Revenues, Net	4,000	5,000	4,000	4,000	4,000
Income (Loss) from Continuing Operations	500	-4,000	-4,000	-4,000	-4,000
Net Income (Loss) (b)	500	-4,000	-4,000	-4,000	-4,000
Cash Flow Provided by (used in) Operating Activities, Net	-1,000	4,000	0	0	0
Capital Additions	1,000	650	550	450	350
Average Number of Employees (a)	300	250	250	240	220

A good place to start is by reading through the visual example of what is contained in this financial report, item "D" the visual example file which is provided in a PDF format.

One thing which the comprehensive example does not get into is taxonomy modularity. Taxonomy modularity architecture decisions need different inputs than provided by this example.

21.2. Details of each network

The following is a summary of each of the networks contained within the comprehensive example and a mapping to the business use case and/or metapattern.

Network	Business Use Case and Other Information
AA, Part 1: Financial Highlights	Flat Hierarchy
BA, Part 1: Balance Sheet	Roll Up
BA, Part 2: Balance Sheet, Classes of Preferred Stock	Simple Compound Fact, shows a class with only one member
BA, Part 3: Balance Sheet, Classes of Common Stock	Simple Compound Fact
BB, Part 1: Income Statement	Roll Up
BB, Part 2: Income Statement, Earnings Per Share	Flat Hierarchy
BC, Part 1: Cash Flow Statement, Direct Method	Roll Forward
BF, Part 1: Changes in Equity, Prior Period Adjustments	Prior Period Adjustment
BF, Part 2: Changes in Equity	Roll Forward
BF, Part 3: Changes in Equity, Preferred Stock, Shares	Roll Forward
BF, Part 4: Changes in Equity, Common Stock, Shares	Roll Forward
BF, Part 5: Changes in Equity [Extra]	
IA, Part 1: Overall Financial Reporting Presentation and Display	Nested Hierarchy
JA, Part 1: Accounting Policies	Nested Hierarchy
JB, Part 1: Cash and Cash Equivalents, Disclosures	Flat Hierarchy
JB, Part 2: Cash and Cash Equivalents, Details	Roll Up
JC, Part 1: Receivables, Disclosures	Flat Hierarchy
JC, Part 2: Receivables, Details, Current/Noncurrent	Roll Up, Multiple Roll Ups
JC, Part 3: Receivables, Details, Gross/Net	Roll Up, Multiple Roll Ups
JC, Part 4: Receivables, Details, by Component	Roll Up, Multiple Roll Ups
JD, Part 1: Inventory, Disclosures	Flat Hierarchy
JE, Part 1: Prepaid Expenses, Disclosures	Flat Hierarchy
KA, Part 1: Property, Plant and Equipment, Disclosures (As Concepts)	Roll Up
KA, Part 2: Property, Plant and Equipment, Details (As Concepts)	Roll Up
KA, Part 3: Property, Plant and Equipment, Movement (As Concepts)	Roll Forward
KF, Part 1: Property, Plant and Equipment, Disclosures (Class as Axis)	Class
KF, Part 2: Property, Plant and Equipment, Details (Class as Axis)	Class Properties
KF, Part 3: Property, Plant and Equipment, Leasehold Land and Buildings	Multiple Periods Compound Fact
KG, Part 1: Other Assets, Disclosures	Flat Hierarchy
KG, Part 2: Other Assets, Details	Roll Up
LA, Part 1: Payables and Accruals, Details	Roll Up
LA, Part 1: Payables and Accruals, Disclosures	Flat Hierarchy
LB, Part 1: Debt, Disclosures	Flat Hierarchy
LB, Part 2: Debt, Details	Roll Up
LB, Part 3: Debt, Maturities	Roll Up, ties to total debt
LB, Part 4: Debt, Instruments	Compound Fact, ties to total debt
LB, Part 5: Debt, Details, Current/Noncurrent Breakdown	Roll Up, ties to total debt
LC, Part 1: Other Liabilities, Disclosures	Flat Hierarchy
LC, Part 2: Other Liabilities, Details	Flat Hierarchy
MA, Part 1: Equity, Disclosures	Flat Hierarchy

NA, Part 1: Income Taxes, Disclosures	Flat Hierarchy
NA, Part 2: Income Tax Expense (Benefit), Details	Roll Up
OA, Part 1: Subsequent Events	Compound Fact
OB, Part 1: Business Segments	Roll Up
OC, Part 1: Related Parties	Nested Compound Fact
OC, Part 2: Related Party Transactions	Nested Compound Fact
OC, Part 3: Director Compensation	Simple Compound Fact
OC, Part 4: Share Ownership Plans	Nested Roll Forward
PB, Part 1: Reconciliation of Cash, Summary	Reconciliation
PB, Part 2: Reconciliation of Cash, Detail	Reconciliation
PC, Part 2: Investments, Details	Grouped Report
PC, Part 3: Sales Analysis	Compound Fact
QA, Part 1: Variance Analysis	Variance
VA, Part 1: Document Information	Flat Hierarchy
VB, Part 1: Address	Flat Hierarchy

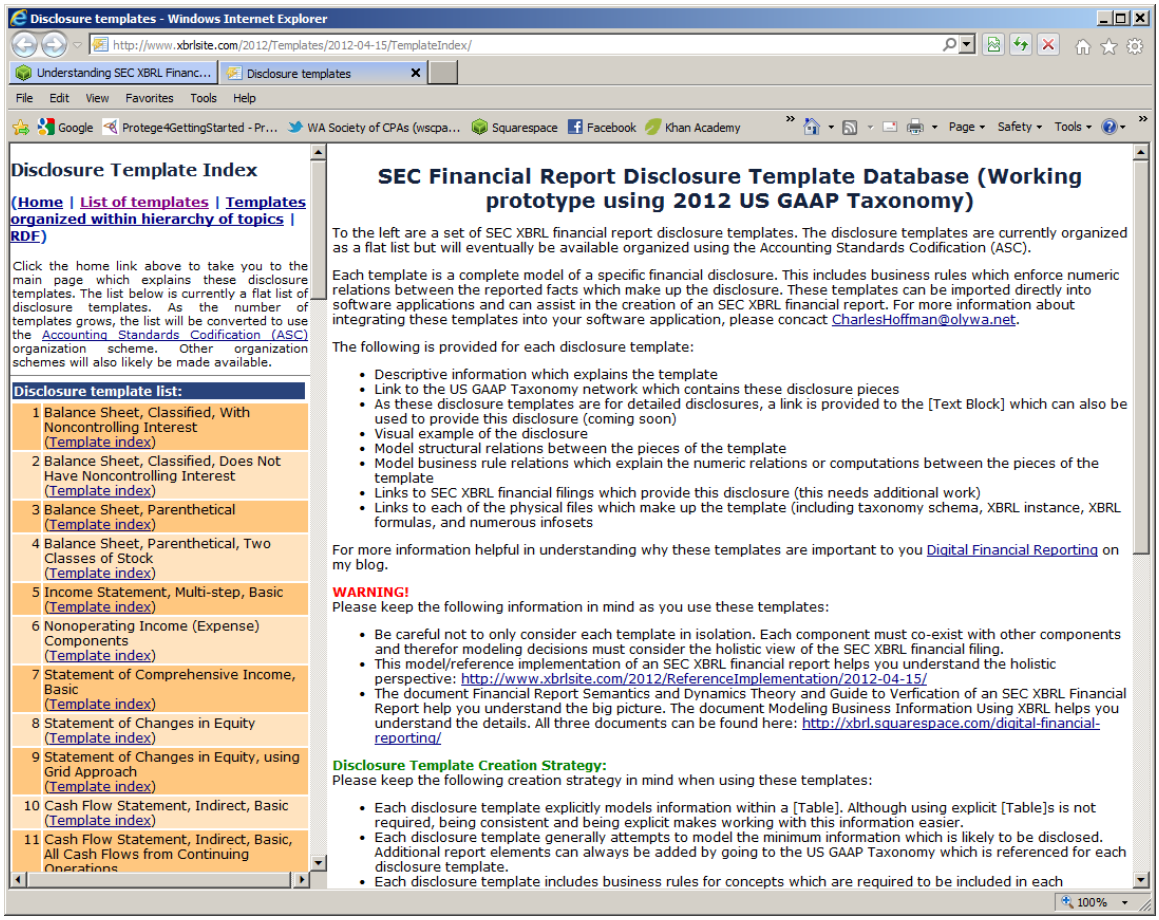
22. Financial Disclosure Template Examples

The financial disclosure templates are a set of 75 smaller implementations of financial report disclosures, similar to the business use cases. Disclosure templates are created for common financial report disclosures. The disclosure templates are modelled compliant with SEC XBRL financial report rules and using the 2012 US GAAP Taxonomy.

22.1. Overview of financial disclosure templates

The disclosure templates can be found at the following URL:

http://www.xbrlsite.com/2012/Templates/2012-04-15/TemplateIndex/index.html



22.2. Details of financial disclosure templates

The following is a summary of the different disclosure templates available:

Template label	Description
Accounting Policies	Basic summary of significant accounting policies
Accrued Liabilities Components	Components of accrued liabilities
Antidilutive Securities Excluded from Computation of Earnings Per Share	Details of antidilutive securities excluded from computation of earnings per share

Template label	Description
Asset Retirement Obligation Roll Forward	Asset retirement obligation roll forward
Balance Sheet, Classified, Does Not Have Noncontrolling Interest	Basic classified balance sheet which does not include a noncontrolling interest.
Balance Sheet, Classified, With Noncontrolling Interest	Basic classified balance sheet which contains a noncontrolling interest.
Balance Sheet, Parenthetical	Balance sheet parenthetical information
Balance Sheet, Parenthetical, Two Classes of Stock	Balance sheet parenthetical information with two classes of stock
Business Acquisitions	Business acquisitions by acquisition
Capital Leases Future Minimum Payments Due	Future Minimum Lease Payments for Capital Leases
Cash Flow Statement, CONTRA EXAMPLE, Exchange Gain in Wrong Location	Cash flow statement, exchange gain modeled INCORRECTLY.
Cash Flow Statement, Indirect, Basic	Basic cash flow statement using indirect method, no discontinued operations
Cash Flow Statement, Indirect, Basic, All Cash Flows from Continuing Operations	Basic cash flow statement using indirect method, no discontinued operations; specifically uses concepts indicating that cash flows are from continuing operations
Cash Flow Statement, With Discontinued Operations, Option 1	Cash flow statement WITH discontinued operations, option 2.
Cash Flow Statement, With Discontinued Operations, Option 2	Cash flow statement, questionable modeling. INCORRECT
Cash, Cash Equivalents, and Short-term Investments Components	Components of cash, cash equivalents, and short-term investments
Change in Benefit Obligation	Change (roll forward) in benefit obligation of defined benefit plans.
Change in Fair Value of Benefit Plan Assets	Change (roll forward) in benefit plan assets of defined benefit plans.
Concentrations of Risk	Basic example of current vulnerability due to certain concentrations.
Contract Receivable Retainage, Fiscal Year Maturity	Fiscal year maturities of contract receivable retainage
Cost-method Investments	Cost-method Investments, Realized Gain (Loss), Excluding Other than Temporary Impairments
Debt Instruments	Basic disclosure of individual long-term debt instruments
Deferred Revenue Arrangement, by Type	Detail of deferred revenue arrangements organized by type of arrangement.
Discontinued Operations, by Disposal Group	Discontinued operations by disposal group
Document and Entity Information, Basic	Basic document and entity information, all modeled together which leads to illogical characteristics provided for some reported facts
Document and Entity Information, Separate into Three Logical Pieces	Basic document and entity information, breaks out document information, entity information, and common stock related information into individual components
Document and Entity Information, Separate into Two Pieces	Basic document and entity information, breaks out document information and entity information; still leads to illogical characteristics provided for some reported facts
Document and Entity Information, Separate Tables in Separate Networks	Basic document and entity information, breaks out document information and entity information (including stock information) into separate tables and separate networks.
Document information	Information about the report itself, the document submitted
Effective Income Tax Rate Reconciliation	Reconciliation between income tax rate between statutory rate and effective rate
Entity Information	Information which describes the entity which filed the report.
Entity Listings	Information about an entity's listings
Equity Method Investments	Details of each equity method investment which includes the investment name and the percentage ownership of common stock of each investment.
Extraordinary Items, Basic	Basic example of an extraordinary item.
Fair Value of Assets and Liabilities Measured on Recurring and Nonrecurring Basis	Fair value measurements on recurring or nonrecurring basis

Template label	Description
Fair Value, Assets Measured on Recurring Basis, Unobservable Input Reconciliation	Fair Value of Assets Measured on Recurring Basis, Unobservable Input Reconciliation
Finite-Lived Intangible Assets Acquired as Part of Business Combination	Finite-lived intangible assets acquired as part of business combination
Finite-Lived Intangible Assets, Future Amortization Expense	Future amortization expense for finite-lived intangible assets
Funding Status of Defined Benefit Plans	Combination of change in benefit obligation and change in defined benefit plan assets.
Geographic Area Information	Basic disclosure of the details of revenue from external customers and long-lived assets, by geographical area
Geographic Area Information, Nested Hierarchy	Basic disclosure of the details of revenue from external customers and long-lived assets, by geographical area; but with regions this a nested hierarchy
Geographic Area Information, Nested Hierarchy, Bad example	BAD EXAMPLE: This is a contra-example of how NOT to model geographic areas. (1) Use the existing countries taxonomy rather than create extensions. (2) Create a nested hierarchy within the geographic area [Axis] rather than creating a Countries [Axis].
Hedging Instrument Balance Sheet Location of Gains and Losses Reported	Schedule that discloses the location and fair value amounts of derivative instruments (and nonderivative instruments that are designated and qualify as hedging instruments) reported in the statement of financial position. Schedule of the location and amount of gains and losses reported in the statement of financial performance (or when applicable, the statement of financial position, for example, gains and losses initially recognized in other comprehensive income) on derivative instruments designated and qualifying as hedging instruments in fair value hedges and related hedged items designated and qualifying in fair value hedges. Schedule of the location and amount of gains and losses reported in the statement of financial performance (or when applicable, the statement of financial position, for example, gains and losses initially recognized in other comprehensive income) on derivative instruments designated and qualifying as hedging instruments in cash flow hedges. Schedule of the location and amount of gains and losses reported in the statement of financial performance (or when applicable, the statement of financial position, for example, gains and losses initially recognized in other comprehensive income) on derivative instruments not designated as hedging instruments.
Income Statement, Multi-step, Basic	Basic multi-step income statement
Income Statement, Single-Step	Income statement with a flat organization
Income Statement, With Discontinued Operations	Income statement with noncontrolling interest
Income Statement, With Noncontrolling Interest	Minimum income statement
Income Statement, With Preferred Dividends	Income statement with preferred dividends.
Income Tax Provision Components	Income tax provision (benefit) components broken out by jurisdiction and then by current/deferred
Income Tax Provision Components Alternative	Income tax provision (benefit) components broken out by current/deferred and then by jurisdiction
Inventory Components	Basic disclosure for the breakdown of components of inventory
Line of Credit Facility	Disclosure for line of credit facilities
Long-Term Debt Maturities	Basic disclosure for long-term debt maturities
Long-term Purchase Commitments	Basic disclosure of long-term purchase commitments of a reporting entity
Loss Contingency Accrual	Basic loss contingency accrual roll forward
Marketable Debt Securities By Contractual Maturity	Marketable Debt Securities By Contractual Maturity, amortized cost and fair value
Marketable Securities Components	Marketable securities components including reconciliation from cost to estimated fair value

Template label	Description
Nonmonetary Transaction By Type	Basic disclosure of the details of nonmonetary transactions classified by the type of transaction
Nonoperating Income (Expense) Components	Other nonoperating income (expense)
Operating Leases Future Minimum Payments Due	Future minimum payments due under operating leases
Organization, Consolidation, Basis of Presentation	Basic disclosures for nature of operations, consolidation of financial statements and basis of presentation of financial statements
Other Assets Components	Other assets
Other Liabilities, Noncurrent, Components	Components of other noncurrent liabilities
Prior Period Adjustment	Prior period adjustment
Product Warranty Accrual Roll Forward	Change in the product warranty accrual balance sheet account
Property, Plant and Equipment Policy	Basic summary of property, plant, and equipment related accounting policies broken down by type of PPE; each type modeled as a [Member] of an [Axis]
Property, Plant, and Equipment Components	Basic disclosure for the breakdown of the components of property, plant and equipment categorized by type; models each type of property, plant and equipment using an [Axis]
Property, Plant, and Equipment Components Alternative	Basic disclosure for the breakdown of the components of property, plant and equipment categorized by type; models each type of property, plant and equipment using a [Concept]
Receivables Components	Components of receivables
Reconciliation of Unrecognized Tax Benefits	Reconciliation of unrecognized tax benefits
Related Party Transactions	Related party transactions
Restructuring Reserve Roll Forward	Restructuring reserve roll forward
Segment Information	Basic disclosure of the details of net income (loss), assets, and other common disclosures for each reportable segment of a reporting entity
Select Financial Information	Select financial information, shows the variance information model
Share-based Compensation Arrangement By Award	Share-based Compensation Arrangement by Share-based Payment Award, Options, Outstanding Roll Forward and Share-based Compensation Arrangement by Share-based Payment Award, Options, Outstanding, Weighted Average Exercise Price Roll Forward
Statement of Changes in Equity	Statement of changes in equity
Statement of Changes in Equity, using Grid Approach	Statement of changes in equity using the common [Grid] approach as done in the US GAAP Taxonomy
Statement of Comprehensive Income, Basic	Very basic Statement of Comprehensive income (WARNING!!! Not totally sure I have these calculations/XBRL formulas correct; need to double check these)
Stock by Class	Stock by class, preferred and common
Subsequent Events	Basic subsequent events disclosure
Unusual or Infrequent Item	Unusual or infrequent financial statement item
Variable Interest Entities, Carrying Amounts of Assets and Liabilities	Disclosure of carrying amounts of assets and liabilities in the statement of financial position of each VIE for the reporting entity.

22.3. Information available for each disclosure template

Each disclosure template has the following information available: (the screen shots below provide an example of the information available using the document information template)

Template Descriptive Information

Template label:	**Document information**
Template code:	995200-005-DocumentInformation
Template description:	Information about the report itself, the document submitted
Keywords:	document
Disclosure object code:	Document Information
Star rating:	(5 stars)
Status:	WIP
US GAAP Taxonomy Network Location:	995200 - Document - Document Information
Reorganized US GAAP Taxonomy Network Location:	995200 - Document - Document Information
Business rules:	• Current Fiscal Year End Date (dei:CurrentFiscalYearEndDate) required in this component. (ASSERTION_Exists_CurrentFiscalYearEndDate) • Document Period End Date (dei:DocumentPeriodEndDate) required in this component. (ASSERTION_Exists_DocumentPeriodEndDate) • Document Fiscal Year Focus (dei:DocumentFiscalYearFocus) required in this component. (ASSERTION_Exists_DocumentFiscalYearFocus) • Document Fiscal Period Focus (dei:DocumentFiscalPeriodFocus) required in this component. (ASSERTION_Exists_DocumentFiscalPeriodFocus) • Amendment Flag (dei:AmendmentFlag) required in this component. (ASSERTION_Exists_AmendmentFlag) • Document Type (dei:DocumentType) required in this component. (ASSERTION_Exists_DocumentType)
Equivalent [Text Block]:	Document Information [Text Block]

Visual image

	0000000001
	Year ended 31-Dec-2010
Document Information [Abstract]	
Document Information [Table]	
Document Information [Line Items]	
Document Information [Hierarchy]	
Document Type	10-K
Amendment Flag	false
Document Fiscal Period Focus	FY
Document Fiscal Year Focus	2010
Document Period End Date	31-Dec-2010
Current Fiscal Year End Date	31-Dec

Model Structural Relations

Line	Label	Object Class	Data type	Period Type	Balance	Name
1	Document Information	[Network]				http://www.template.com/DocumentInformation
2	Document Information [Abstract]	[Concept] (Abstract)				added:DocumentInformationAbstract
3	Document Information [Table]	[Table]				dei:DocumentInformationTable
4	Legal Entity [Axis]	[Axis]				dei:LegalEntityAxis
5	Consolidated Entity [Domain]	[Member]				dei:EntityDomain
6	Document Information [Line Items]	[Line Items]				dei:DocumentInformationLineItems
7	Document Information [Hierarchy]	[Concept] (Abstract)				added:DocumentInformationHierarchy
8	Document Type	[Concept]	Submission Type	For Period		dei:DocumentType
9	Amendment Flag	[Concept]	Yes/No	For Period		dei:AmendmentFlag
10	Document Fiscal Period Focus	[Concept]	Fiscal Period	For Period		dei:DocumentFiscalPeriodFocus
11	Document Fiscal Year Focus	[Concept]	Year	For Period		dei:DocumentFiscalYearFocus
12	Document Period End Date	[Concept]	Date	For Period		dei:DocumentPeriodEndDate
13	Current Fiscal Year End Date	[Concept]	Month/Day	For Period		dei:CurrentFiscalYearEndDate

Similar SEC XBRL Filer Examples

3D SYSTEMS CORP | Activision Blizzard, Inc. | ADOBE SYSTEMS INC | AKAMAI TECHNOLOGIES INC | ALEXION PHARMACEUTICALS INC | ALLERGAN INC | ALLSCRIPTS HEALTHCARE SOLUTIONS, INC. | AMERICAN AXLE & MANUFACTURING HOLDINGS INC | AMETEK INC/ | AMKOR TECHNOLOGY INC | AMYRIS, INC. | Ancestry.com Inc. | ANSYS INC | AON CORP | ARBITRON INC | ASIAINFO-LINKAGE, INC | ASTEC INDUSTRIES INC | AUTOLIV INC | Avery Dennison Corp | BAKER HUGHES INC | BALCHEM CORP | BARD C R INC /NJ/ | BAXTER INTERNATIONAL INC | BEAM INC | BEMIS CO INC | BENCHMARK ELECTRONICS INC | BLACKBAUD INC | BLUE NILE INC | BOEING CO | BORGWARNER INC | BOSTON SCIENTIFIC CORP | BRINKS CO | BRISTOL MYERS SQUIBB CO | BRUKER CORP | C H ROBINSON WORLDWIDE INC | CADENCE DESIGN SYSTEMS INC | CAMERON INTERNATIONAL CORP | CAPELLA EDUCATION CO | CARDTRONICS INC | CASH AMERICA INTERNATIONAL INC | CEC ENTERTAINMENT INC | CENTRAL EUROPEAN MEDIA ENTERPRISES LTD | CEPHEID | CERNER CORP /MO/ | CHEVRON CORP | CHURCH & DWIGHT CO INC /DE/ | CIENA CORP | CIRCOR INTERNATIONAL INC | CLEAN HARBORS INC | COGNEX CORP | COGNIZANT TECHNOLOGY SOLUTIONS CORP | COLUMBIA SPORTSWEAR CO | COMPASS MINERALS INTERNATIONAL INC | COMSCORE, INC. | CONMED CORP | Constant Contact, Inc. | COOPER COMPANIES INC | CORNING INC /NY | CORPORATE EXECUTIVE BOARD CO | COTT CORP /CN/ | CRANE CO /DE/ | CTC Media, Inc. | CURTISS WRIGHT CORP | CYMER INC | DELUXE CORP | Digital Generation, Inc. | Discovery Communications, Inc. | DOMINOS PIZZA INC | DRIL-QUIP INC | DUPONT E I DE NEMOURS & CO | EMCOR GROUP INC | ENDO PHARMACEUTICALS HOLDINGS INC | ENPRO INDUSTRIES, INC | EOG RESOURCES INC | EQUIFAX INC | EQUINIX INC | ESTERLINE TECHNOLOGIES CORP | EXPEDITORS INTERNATIONAL OF WASHINGTON INC | EXPRESS SCRIPTS INC | EXXON MOBIL CORP | FASTENAL CO | FEI CO | FERRO CORP | FIRST SOLAR, INC. | FLEETCOR TECHNOLOGIES INC | FLIR SYSTEMS INC | FLOWSERVE CORP | FMC TECHNOLOGIES INC | FOSSIL INC | FRESH DEL MONTE PRODUCE INC | FTI CONSULTING INC | GARDNER DENVER INC | GEN PROBE INC | GEORGIA GULF CORP /DE/ | GRACO INC | GRAINGER W W INC | GROUP 1 AUTOMOTIVE INC | HALF ROBERT INTERNATIONAL INC /DE/ | HALLIBURTON CO | Hanesbrands Inc. | HARLEY DAVIDSON INC | HARMONIC INC | HASBRO INC | HITTITE MICROWAVE CORP | HORNBECK OFFSHORE SERVICES INC /LA | HUB GROUP INC | IDEX CORP /DE/ | IDEXX LABORATORIES INC /DE | ILLINOIS TOOL WORKS INC | ILLUMINA INC | INFORMATICA CORP | INGRAM MICRO INC | INSIGHT ENTERPRISES INC | INTEGRA LIFESCIENCES HOLDINGS CORP | INTEL CORP | Intermec, Inc. | INTERNATIONAL FLAVORS & FRAGRANCES INC | INTUITIVE SURGICAL INC | ION GEOPHYSICAL CORP | IPG PHOTONICS CORP | JOHNSON & JOHNSON | JONES GROUP INC | KAYDON CORP | KBR, INC. | KELLOGG CO | KRAFT FOODS INC | Kraton Performance Polymers, Inc. | L 3 COMMUNICATIONS CORP | LABORATORY CORP OF AMERICA HOLDINGS | LANDSTAR SYSTEM INC | LEGGETT & PLATT INC | LEXMARK INTERNATIONAL INC /KY/ | Life Technologies Corp | LILLY ELI & CO | LINCOLN ELECTRIC HOLDINGS INC | LKQ CORP | LUMINEX CORP | MANHATTAN ASSOCIATES INC | MARSH & MCLENNAN COMPANIES, INC. | MASIMO CORP | MASTERCARD INC | MATERION Corp | MCDERMOTT INTERNATIONAL INC | MCDONALDS CORP | MCGRAW-HILL COMPANIES INC | MEDICINES CO /DE | MERCADOLIBRE INC | Merck & Co. Inc. | MERGE HEALTHCARE INC | METTLER TOLEDO INTERNATIONAL INC/ | MICROSTRATEGY INC | MINE SAFETY APPLIANCES CO | MINERALS TECHNOLOGIES INC | MKS INSTRUMENTS INC | MOHAWK INDUSTRIES INC | Motorola Solutions, Inc. | MSCI Inc. | MUELLER INDUSTRIES INC | MYLAN INC. | NAVIGANT CONSULTING INC | NEKTAR THERAPEUTICS | NEWMARKET CORP | NEWPARK RESOURCES INC | NII HOLDINGS INC | NORDSON CORP | NOVELLUS SYSTEMS INC | NU SKIN ENTERPRISES INC | NUCOR CORP | NUVASIVE INC | NxStage Medical, Inc. | OFFICEMAX INC | OIL STATES INTERNATIONAL, INC | OM GROUP INC | ON SEMICONDUCTOR CORP | ORTHOFIX INTERNATIONAL N V | PEGASYSTEMS INC | PEPSICO INC | PHOTRONICS INC | PILGRIMS PRIDE CORP | POLYONE CORP | PPG INDUSTRIES INC | PROGRESS SOFTWARE CORP /MA | QLIK TECHNOLOGIES INC | QUANTA SERVICES INC | QUEST SOFTWARE INC | REGAL BELOIT CORP | Riverbed Technology, Inc. | ROPER INDUSTRIES INC | RSC Holdings Inc. | RTI INTERNATIONAL METALS INC | SAFEWAY INC | SALIX PHARMACEUTICALS LTD | SANDISK CORP | SAPIENT CORP | SAVIENT PHARMACEUTICALS INC | SEALED AIR CORP/DE | SENSIENT TECHNOLOGIES CORP | SHERWIN WILLIAMS CO | SIGMA ALDRICH CORP | SIMPSON MANUFACTURING CO INC /CA/ | SOHU COM INC | SolarWinds, Inc. | SOUTHWESTERN ENERGY CO | Spectra Energy Corp. | ST JUDE MEDICAL INC | STAPLES INC | STARWOOD HOTEL & RESORTS WORLDWIDE, INC | SUPERIOR ENERGY SERVICES INC | SYKES ENTERPRISES INC | SYNOPSYS INC | SYNTEL INC | TEMPUR PEDIC INTERNATIONAL INC | TENNANT CO | TERADATA CORP /DE/ | THOMAS & BETTS CORP | TIBCO SOFTWARE INC | TIMKEN CO | TITAN INTERNATIONAL INC | TITANIUM METALS CORP | TORO CO | TRIMBLE NAVIGATION LTD /CA/ | TTM TECHNOLOGIES INC | TUPPERWARE BRANDS CORP | ULTIMATE SOFTWARE GROUP INC | Under Armour, Inc. | UNISYS CORP | UNITED PARCEL SERVICE INC | UNITED STATES STEEL CORP | UNITED STATIONERS INC | UNITED TECHNOLOGIES CORP /DE/ | USG CORP | V F CORP | VALUECLICK INC/CA | VEECO INSTRUMENTS INC | VERISIGN INC/CA | Verisk Analytics, Inc. | VIROPHARMA INC | WABCO Holdings Inc. | Warner Chilcott plc | WASTE MANAGEMENT INC | WATSON PHARMACEUTICALS INC | WEBSENSE INC | WEIGHT WATCHERS INTERNATIONAL INC | WERNER ENTERPRISES INC | WESTINGHOUSE AIR BRAKE TECHNOLOGIES CORP | WRIGHT MEDICAL GROUP INC | WYNDHAM WORLDWIDE CORP | WYNN RESORTS LTD | YUM BRANDS INC | ZEBRA TECHNOLOGIES CORP | ZIMMER HOLDINGS INC |

Template Files

Model taxonomy schema:	Template.xsd
Model instance:	Instance.xml
Model business rules:	Template_formulas.xml
Model business rules verification results:	Instance_XPE_FormulaTrace.html | Instance_XPE_Calctrace.html
Model structural relations (HTML):	Template_Relations.html
Model structural relations (XML infoset):	Template_Relations.xml
XBRL Technical Syntax Validation:	Per XBRL Cloud (XRun) | (Also validated using UBmatrix XPE and Taxonomy Designer)

23. Reference Implementation of XBRL-based Public Company Financial Filing to SEC

The reference implementation of an SEC XBRL financial filing builds on the metapatterns, business use cases, comprehensive example, and disclosure templates. It is like the comprehensive example in that the reference implementation puts all business use cases together to be sure they interact with one another correctly.

The reference implementation endeavours to create a digital financial report which adheres to the filing rules specified by the SEC within the Edgar Filer Manual (EFM). It uses the 2012 US GAAP taxonomy. It follows the modelling principles and practices shown in other parts of this resource.

The ultimate goal of the reference implementation is to create a digital financial report which is a true and fair representation of a financial report which complies with all EFM filing rules. All mathematical computations cross cast and foot. All the pieces of the reference implementation property tick and tie. The digital financial report works the same as a financial report articulated on paper or electronically using HTML or PDF; it is just that the information is formatted in XBRL so that the information in the financial report can be *effectively* exchanged. While not being a 100% complete financial report from a financial reporting perspective, it does have all the "moving pieces" of a financial report yet allows the user to focus on modelling of financial information digitally rather than being distracted that it does not look enough like a financial report.

This section explains this reference implementation in more detail.

23.1. Overview of reference implementation

The *Reference Implementation* of an SEC XBRL financial filing can be found at the following URL:

http://www.xbrlsite.com/DigitalFinancialReporting/ReferenceImplementation/2013-05-15

At that URL you will see an index page which is similar to the index pages of the metapatterns and business use cases and looks as follows:

Reference Implementation (2012-09-30) Using 2012 US GAAP Taxonomy

#	Item	Description
A.	Title	Reference Implementation (2012-09-30) Using 2012 US GAAP Taxonomy *Note that this model and supporting information are being updated to leverage the Financial Report Semantics and Dynamics Theory*
B.	Description	This is a reference implementation of an SEC XBRL financial filing using the ideas of the Financial Report Semantics and Dynamics Theory as modeled using a specific and allowed model as expressed in the document Digital Financial Reporting. The purpose of the reference implementation is to try and assure that a correct SEC XBRL financial filing can be created and verified to be a true and fair representation of such financial report. This reference implementation exercises all the things one might find in such a financial filing helping to make sure the individual components work correctly and components work together appropratelly.
C.	Industry/Activity	Commercial and Industrial Companies
D.	XBRL instance	XBRL instance
E.	XBRL taxonomy	XSD
F.	XBRL calculations	XML (Linkbase) | Calculation Consistency Check Results
G.	XBRL formulas: reporting entity specific rules	XML (Linkbase)
H.	XBRL formulas: US GAAP domain level rules	XML (Linkbase)
I.	XBRL formulas: Industry/Activity level rules	XML (Linkbase)
J.	Validation results for XBRL formulas	Reporting entity specific, US GAAP domain level, and industry/activity level rules validation results
K.	Download: Test submission ZIP file (works with SEC Previewer, however you MUST remove links to XBRL formulas within the XBRL instance)	ZIP
L.	Download: All files	ZIP
M.	Human readable evidence package (provided by XBRL Cloud)	Coming soon!
N.	Documentation	PDF

The purpose of the reference implementation is to bring to light in the form of physically instantiated examples and key considerations related to expressing financial information digitally, such as using the XBRL global standard. The primary focus of this reference implementation of the model is two areas. The first area is the intersections between different components which make up a financial statement. The second area is the notion of integrity at both the component level of a financial report and the overall or holistic integrity of a financial report and the system in which that report will be used.

The document explains the perspective used when evaluating this reference/model financial report, it sets forth precise terminology used to describe the reference/model financial report in order to minimize confusion.

Then, the document describes each financial report component which is expressed, provides visual fragment of the component as a point of reference, describes the key characteristics of the financial report component, articulates the business rules of the component, and how the component intersects or interacts with other financial report components.

The ultimate goal of this reference/model implementation of a digital financial report is to better understand such reports, learn about such reports, and communicate information helpful in determining the appropriate way or ways to use mediums, such as XBRL, to express financial information digitally.

Ultimately the financial reporting supply chain will need to determine the most appropriate approach. It is hoped that this information contributes to the financial reporting supply chain's understanding of the mechanics of technologies used such as XBRL.

23.2. How to read component information

The underlying technical syntax of technologies such as XBRL are technical, difficult to understand at the technical syntax level particularly for business professionals, and therefore result in a narrow set of business professionals who can relate to this information. Using a specific software application to understand this information likewise has challenges.

This documentation tries to strike a balance between meeting the needs of business professionals and in particular accountants which must understand this information, providing proprietary views of this information which are not generally understood, and otherwise trying to communicate useful information about a complex topic to both business professionals and technical users whom advise these business professionals.

XBRL Cloud's "Evidence Package" was picked as a way to explain this information because it is a complete and accurate implementation of ideas expressed by the *Financial Report Semantics and Dynamics Theory*, *Guide to Verification of an SEC XBRL Financial Report*, *Modeling Business Information Using XBRL*, the *US GAAP Taxonomy Architecture*, and other such documents which attempt to explain digital financial reports. Other software will be shown to make specific points, show consistency between software, and wherever else it serves a purpose to do so. The use of XBRL Cloud's software in no way implies that XBRL Cloud software is the only software which implements these ideas.

The following explains how to read the information provided by the XBRL Cloud Evidence Package for each component by providing a detailed explanation of one component. This same process can be used to understand each of the components of the reference/model implementation of a digital financial report. Providing every example of every component would make this document to large and cluttered to serve its purpose. Using this document in combination with the XBRL Cloud Evidence Package or other software application which makes this information available is how this document is intended to be used.

The best starting point for looking at a component is by looking at its **rendering**. The rendering displays all information about the reported facts for a component provided within a financial report. From the rendering, business professionals can click on any fact and see the **fact properties** of any reported fact. You can likewise click on any report element used within that component and get information as to the **report element properties**. If parenthetical explanations exist, they can also be navigated to using the rendering view.

The following is an example of the rendering view for the "Inventory Components" section of a financial report. It shows the details which make up the individual components of inventory and the total amount of inventory which intersects with the balance sheet.

Component: (Network and Table)	
Network	5040 - Disclosure - Inventory Components (http://www.abc.com/role/InventoryComponents)
Table	Inventory Components [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Inventory Components [Line Items]	Period	
	2012-12-31	2011-12-31
Inventory, Net [Roll Up]		
Finished Goods	1,000,000	1,000,000
Work in progress	1,000,000	1,000,000
Raw materials	1,000,000	1,000,000
Other	1,000,000	1,000,000
Total inventories, net	4,000,000	4,000,000

Another useful view of the report component is the SEC interactive viewer rendering or **SEC preview**. One down side is that the SEC preview does not display 100% of the information about report elements or reported facts. Here is the SEC preview of the Inventory Components component.

Inventory Components (USD $) In Thousands, unless otherwise specified	Dec. 31, 2012	Dec. 31, 2011
Inventory, Net [Roll Up]		
Finished Goods	$ 1,000	$ 1,000
Work in progress	1,000	1,000
Raw materials	1,000	1,000
Other	1,000	1,000
Total inventories, net	$ 4,000	$ 4,000

Another view of a component is the **model structure**. The model structure shows the relations between report elements which work together to model a financial report component. Report elements are grouped together in helpful groupings, or report element classes, to make working with the information easier. Here is the model structure of the Inventory Components component.

Model Structure

Component: (Network and Table)	
Network	5040 - Disclosure - Inventory Components (http://www.abc.com/role/InventoryComponents)
Table	Inventory Components [Table]

#	Label	Report Element Class	Period Type	Balance	Name
1	**Inventory Components [Table]**	[Table]			abc:InventoryComponentsTable
2	**Legal Entity [Axis]**	[Axis]			dei:LegalEntityAxis
3	Consolidated Entity [Domain]	[Domain]			dei:EntityDomain
4	**Inventory Components [Line Items]**	[Line Items]			abc:InventoryComponentsLineItems
5	*Inventory, Net [Roll Up]*	[Abstract]			us-gaap:InventoryNetAbstract
6	Finished Goods	[Concept] Monetary	As Of	Debit	us-gaap:InventoryFinishedGoods
7	Work in progress	[Concept] Monetary	As Of	Debit	us-gaap:InventoryWorkInProcess
8	Raw materials	[Concept] Monetary	As Of	Debit	us-gaap:InventoryRawMaterials
9	Other	[Concept] Monetary	As Of	Debit	us-gaap:OtherInventorySupplies
10	Total inventories, net	[Concept] Monetary	As Of	Debit	us-gaap:InventoryNet

If you click on the name of any report element, the **report element properties** of that report element are shown in a popup window. Below the report element properties for the concept "Total inventories, net" are shown and as you can see it provides all properties for that specific report element:

Report Element Properties

Report Standard Label	Inventories
Base Taxonomy Standard Label	Inventory, Net
Documentation	Carrying amount (lower of cost or market) as of the balance sheet date of inventories less all valuation and other allowances. Excludes noncurrent inventory balances (expected to remain on hand past one year or one operating cycle, if longer).
Report Element Class	Concept
Prefix (From Taxonomy)	us-gaap
Balance Type	Debit
Period Type	As Of (instant)
Data Type	Monetary (xbrli:monetaryItemType)
Name	us-gaap:InventoryNet
ID	us-gaap_InventoryNet

Labels of Report Element

From	Role	Label	Lang
Filer	http://www.xbrl.org/2003/role/totalLabel	Total inventories, net	en-us
Filer	http://www.xbrl.org/2003/role/label	Inventories	en-us
Base	http://www.xbrl.org/2003/role/label	Inventory, Net	en-US
Base	http://www.xbrl.org/2003/role/totalLabel	Inventory, Net, Total	en-US

References of Report Element

Publisher	Reference Name	Reference Information

The raw information for reported facts which exist within a reported component is summarized within the **fact table** view of a component. The fact table view shows each fact, the characteristics of each fact, the value of each fact, and for numeric facts it shows the units and rounding of the fact. If any parenthetical explanations (i.e. XBRL footnotes) exist for the fact, you can navigate to those from this view. This is the fact table view of the Inventory Components component.

Fact Table

Component: (Network and Table)	
Network	5040 - Disclosure - Inventory Components (http://www.abc.com/role/InventoryComponents)
Table	Inventory Components [Table]

#	Reporting Entity	Period	Legal Entity [Axis]	Concept	Value	Unit	Rounding	Parenthetical Explanations
1	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Other	1000000	USD	-3	
2	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Other	1000000	USD	-3	
3	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Raw materials	1000000	USD	-3	
4	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Raw materials	1000000	USD	-3	
5	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Inventories	4000000	USD	-3	
6	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Inventories	4000000	USD	-3	
7	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Finished Goods	1000000	USD	-3	
8	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Finished Goods	1000000	USD	-3	
9	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Work in progress	1000000	USD	-3	
10	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Work in progress	1000000	USD	-3	

By clicking on any fact, you can see all the **fact properties** for that individual fact. For example, here is the fact properties for fact # 6 which is "Inventories" for 2011:

Fact Properties

Characteristic, trait or fact	Value of characteristic, trait, or fact
Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Period	2011-12-31
Legal Entity [Axis]	Consolidated Entity [Domain]
Concept	Inventories
Fact value	4000000
Units	USD
Decimals (rounding)	-3
Parenthetical explanation (i.e. footnote)	(None)

Finally, any business rules defined for the fact can be seen in the **business rules** view. If a business rule exists, you should see that rule and the rule should pass the business rule. Business rules include rules expressed using XBRL calculations technical syntax or XBRL Formula technical syntax. For example, here are the business rules which show that the roll up of inventories properly foots for both 2011 and 2012:

Business Rules

Component: (Network and Table)	
Network	5040 - Disclosure - Inventory Components (http://www.abc.com/role/InventoryComponents)
Table	Inventory Components [Table]

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Period	2012-12-31
Measure	USD
Legal Entity [Axis]	Consolidated Entity [Domain]

Label	Rendered		Reported	Calculated	Balance	Decimals	Message
Inventories [Roll Up]							
Finished Goods	1,000,000	+	1,000,000	1,000,000	DR	-3	
Work in progress	1,000,000	+	1,000,000	1,000,000	DR	-3	
Raw materials	1,000,000	+	1,000,000	1,000,000	DR	-3	
Other	1,000,000	+	1,000,000	1,000,000	DR	-3	
Inventories	4,000,000		4,000,000	4,000,000	DR	-3	

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Period	2011-12-31
Measure	USD
Legal Entity [Axis]	Consolidated Entity [Domain]

Label	Rendered		Reported	Calculated	Balance	Decimals	Message
Inventories [Roll Up]							
Finished Goods	1,000,000	+	1,000,000	1,000,000	DR	-3	
Work in progress	1,000,000	+	1,000,000	1,000,000	DR	-3	
Raw materials	1,000,000	+	1,000,000	1,000,000	DR	-3	
Other	1,000,000	+	1,000,000	1,000,000	DR	-3	
Inventories	4,000,000		4,000,000	4,000,000	DR	-3	

While other information is provided within the XBRL Cloud Evidence Package, the information shown in the reports above provide everything which is necessary to understand the financial information expressed by the components of a digital financial report.

23.2.1. Understanding the notion of intersections

A notion which is important to understand is that of an intersection. An intersection is basically an object of a report which is used in more than on location. For example, report elements can be used in one or more locations within a digital

financial report and facts can be used in one or more components of a digital financial report.

Understanding intersections are important for two specific reasons. The primary reason for understanding intersections is to both avoid creating duplicate information and realizing that it is the fact that the intersection can be expressed and if properly expressed avoids such duplicate information.

For example, the balance sheet component has a line item "Inventories" and values for 2012 and 2011 as can be seen below:

Component: (Network and Table)	
Network	2001 - Statement - Balance Sheet (http://www.abc.com/role/BalanceSheet)
Table	Balance Sheet [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Balance Sheet [Line Items]	Period			
	2012-12-31	2011-12-31	2010-12-31	2009-12-31
Assets [Roll Up]				
Current assets [Roll Up]				
Cash, cash equivalents, and marketable securities [Roll Up]				
Cash and cash equivalents	11,000,000	10,000,000	9,000,000	8,000,000
Marketable securities	9,000,000	10,000,000		
Cash, cash equivalents, and marketable securities	20,000,000	20,000,000		
Accounts receivable, net of allowance for doubtful accounts of $1,000 and $1,000	29,000,000	29,000,000		
Inventories	4,000,000	4,000,000		
Prepaid expenses	3,000,000	3,000,000		
Total current assets	56,000,000	56,000,000		

Inventories also exists in the inventories components component where these same two values exist as can be seen here:

Component: (Network and Table)	
Network	5040 - Disclosure - Inventory Components (http://www.abc.com/role/InventoryComponents)
Table	Inventory Components [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Inventory Components [Line Items]	Period	
	2012-12-31	2011-12-31
Inventory, Net [Roll Up]		
Finished Goods	1,000,000	1,000,000
Work in progress	1,000,000	1,000,000
Raw materials	1,000,000	1,000,000
Other	1,000,000	1,000,000
Total inventories, net	4,000,000	4,000,000

This is one type of intersection, the same facts which exist within more than one component. Likewise the characteristics of the fact are used within both components, such as the concept, the legal entity, the period, and the reporting entity.

The main focus on intersections is the intersections of facts in this document.

A secondary reason for understanding intersections is that it enables interesting software features. Not all software applications currently take advantage of such features; however, more software will leverage intersections and those expressing models should understand and provide good models which enable such functionality as opposed to bad models which mask such intersections.

Other specific examples of intersections will be provided throughout this document; here we simply wanted to explain the notion of an intersection.

23.2.2. Reference implementation components

A financial report has many components. A component is simply a piece of a financial report. A component defined as being a set of facts which go together for some specific purpose within a financial report. A component can also be broken down into subcomponents.

The reference implementation has approximately 30 components. Each component is provided for two reasons. The first reason is to provide examples of how to model different components of a financial report. The second is to show how the components of a financial report and that the components fit together. The reference/model implementation is a balance between providing too little and providing too much.

On the one hand, the reference/model implementation digital financial report should look like a financial report. On the other hand, real financial reports can be quite

large, repeat the same sorts of things many times, and be an overwhelming example to work with because of its size. The reference/model implementation looks enough like a financial report and has the pieces of a typical financial report and therefore will not confuse accountants which understand what a financial report should look like. But the reference/model implementation also has all the moving pieces which need to interact with one another correctly.

Everything in the reference/model is there for a specific reason. Accounting is well understood and the reference/model is not about accounting and not about changing accounting or financial reporting.

The reference/model is about figuring out how to use structured mediums such as XBRL to articulate information which is expressed today using unstructured mediums such as paper and electronic paper-type mediums such as HTML, PDF, or Microsoft Word. The reference/model is about figuring out what a digital financial report should look like, all things considered.

The reference/model implementation "works correctly" by one definition of works correctly. Each aspect of "correctly" can be shown and also "incorrectly" can be pointed out because "correct" is so explicitly defined. (This is as opposed to the situation where correct is not well defined and therefore it is hard to figure out if something is, or is not, correct.) If a modelling approach is changed in one area of the reference/model implementation which breaks the model in another area, that modelling option is not considered as an option because it cannot be made to work.

It is the objective balancing of all the allowable options and the fact that when used together the financial report works correctly from a financial reporting perspective and from a technical perspective which decides whether some modelling approach is appropriate or inappropriate. The intent here is to minimize subjectivity. When multiple options work, the option which seems to work the best, all things considered, which is used.

While the reference/model implementation is correct, by the author's definition of correct; other definitions of correct are possible and other definitions of "best modelling approach" are possible. That other approach could be a slight tweaking of this reference/model implementation or it could be a totally overhauled version. However, any other version of any digital financial report should be able to pass the criteria established for this reference/model implementation.

Others may have additional criteria which a digital financial report must have. Perhaps the author missed something or for some other reason neglected to include an important aspect of a digital financial report. If that is the case, the reference/model implementation should be tested against that criteria. On the other hand, any other implementation of a digital financial report should either be able to (a) pass the author's criteria or (b) show why the author's criteria is incorrect.

The criteria which were used to judge the reference implementation are enumerated here. These are the self-imposed criteria which were used to evaluate this reference implementation and define what we mean by "correct":

1. **Every model structure is logical and consistent**. Meaning there are no inconsistent and therefore perhaps confusing or potentially misinterpreted modeling situations. For example, an [Axis] as part of a [Table] definition makes sense; an [Axis] within a set of [Line Items] does not.

2. **Every computation is expressed and proven to work correctly**. Every computation must be proven to work correctly by passing one or more business rules. If a computation relation exists and it is not expressed, then there is no way to tell if the computation works correctly per the XBRL medium.
3. **No duplicate facts**. Duplicate facts result from modeling errors and therefore should not exist.
4. **Everything is consistent**. If there is no specific reason for an inconsistency which can be articulated which justifies the inconsistency; then you are being inconsistent and one of the approaches must be dropped. Inconsistencies cause additional training costs and additional burden, and unnecessary, burden on the user to somehow rationalize the inconsistency.
5. **Each property is correct**. Each property of any component, fact, report element, or parenthetical explanation must be correct from a business meaning or semantics perspective.
6. **Meaning can be logically explained to a business user**. The meaning of each and every aspect of the digital financial report can be explained, logically, to a business user. If the meaning cannot be explained, then it cannot be considered to be correct.
7. **True and fair representation of financial information**. In all other ways the information expressed is correct, complete, accurate, and consistent.

The reference implementation strives to get all the accounting information correct however some things are simplified for the purpose of focusing in expressing the accounting information digitally. As such, some disclosures are left out. The reference implementation strives to look enough like a financial report as not to distract the accounting users but keep in mind that the ultimate goal is to prove the digital expression of financial information.

23.3. Document information

Document information is a hierarchy of facts related only in that they all provide information about the document being submitted.

The document information section of a financial report is required by the SEC and provides basic information about the document itself.

Component: (Network and Table)	
Network	1100 - Document - Document Information (http://www.abc.com/role/DocumentInformation)
Table	Document Information [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Document Information [Line Items]	Period [Axis] 2012-01-01 - 2012-12-31
Document information [Hierarchy]	
Document type	10-K[1]
Amendment flag	false
Document period end date	2012-12-31
Document fiscal year focus	2012
Document fiscal period focus	FY

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Key Points:

- Document information is different than entity information and entity listing information.
- There are no intersections between the document information component and other components of a financial report.
- Note that the document information does not have a "Class of Stock [Axis]", that characteristic makes no sense for any of the concepts reported by this component.
- The relation between the concepts within a document information component is that of a hierarchy as there are no numeric relations between the concepts.
- Note the parenthetical explanation.

Business Rules:

- There are no numeric concepts, therefore there are no computation-type business rules.
- A number of the facts are required to be reported, therefore a business rule is provided to assure that the required fact is reported. For example, a business rule is provided to check for the existence of the "Document Type" fact within the report.

23.4. Entity information

Entity information is a hierarchy of facts related only in that they provide information about the entity submitting the financial report.

Entity information related to the reporting entity which submits a financial report is required by the SEC and provides basic information about the entity which submits the report.

Component: (Network and Table)	
Network	1200 - Document - Entity Information (http://www.abc.com/role/EntityInformation)
Table	Entity Information [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Entity Information [Line Items]	Period [Axis] 2012-01-01 - 2012-12-31
Entity information [Hierarchy]	
Entity registrant name	ABC Company, Inc.
Entity central index key (CIK)	0000000001
Entity well-known seasoned issuer	No
Current fiscal year end date	--12-31
Entity current reporting status	Yes[1]
Entity voluntary filers	No
Entity filer category	Large Accelerated Filer[1]
Entity public float	114,824,600

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Key Points:

- Entity information is different than document information and entity listing information.
- There are no intersections between the entity information component and other components of a financial report.
- Note that the entity information does not have a "Class of Stock [Axis]", that characteristic makes no sense for any of the concepts reported by this component. For example, "Entity Registrant Name" is in no way related to a class of stock.
- The relation between the concepts within a entity information component is that of a hierarchy as there are no numeric relations between the concepts.
- Note the one parenthetical explanation which relates to two facts.

Business Rules:

- There are no numeric concepts, therefore there are no computation-type business rules.
- A number of the facts are required to be reported, therefore a business rule is provided to assure that the required fact is reported. For example, a business rule is provided to check for the existence of the "Entity Registrant Name" fact within the report.

QUESTION: It is unclear to me whether Entity Public Float is reported per entity or per listing.

23.5. Entity listing information

Entity listing information is a hierarchy of facts related only in that the facts provide information about the listings of an entity.

Entity listing information related to each listing of the reporting entity which submits a financial report and is required by the SEC.

Component: (Network and Table)	
Network	1300 - Document - Entity Listings Information (http://www.abc.com/role/EntityListingsInformation)
Table	Entity Listings [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0000000001 (http://www.sec.gov/CIK)
Period [Axis]	2012-01-01 - 2012-12-31
Legal Entity [Axis]	Consolidated Entity [Domain]

Entity Listings [Line Items]	Class of Stock [Axis]	
	Common Class A [Member]	Common Class B [Member]
Listing [Hierarchy]		
Trading symbol	abc	abc
Entity common stock shares outstanding	50,000	40,000

Key Points:

- Entity listing information is different than document information and entity information.
- There is an intersection between the listings and the class of stock reported on the balance sheet, earnings per share computations, and other information reported which relates to a specific class of stock.
- Note that the entity listing information does have a "Class of Stock [Axis]".
- The relation between the concepts within a entity listing information component is that of a hierarchy as there are no numeric relations between the concepts.

Business Rules:

- There are no numeric relations. It makes no sense to aggregate the shares of class A and class B common stock.
- The "Entity Common Stock, Shares Outstanding" is required to be reported within this component and therefore a business rule exists to test for this fact.

QUESTION: What is the difference between this "Entity Common Stock, Shares Outstanding" and the common stock shares outstanding concept which is used on the balance sheet? It seems to me that this is a duplicate concept.

HINT: Mismatched [Axis] and [Line Items] cause "empty cells" and are generally a sign of a modelling error.

If you look at the "Document and Entity Information" as reported by most SEC filers, that one component combines the three separated components modelled in the reference model implementation: document information, entity information, and entity listing information. This results in numerous "blank cells". Blank cells such as this is generally a sign of an incorrect or at least less than optimal modelling.

For example, an "Entity Registrant Name" would never have a class of stock associated with it. Same thing for other reported facts. Assigning the wrong [Axis] within a model results in empty cells which could never be filled with reported information. This is a clue that the model has been created incorrectly.

Document and Entity Information (USD $)	12 Months Ended			
	Dec. 31, 2011	Jun. 30, 2011	Jan. 19, 2012 Class A Common Stock	Jan. 19, 2012 Class B Common Stock
Document Information [Line Items]				
Document Type	10-K			
Amendment Flag	false			
Document Period End Date	Dec. 31, 2011			
Document Fiscal Year Focus	2011			
Document Fiscal Period Focus	FY			
Trading Symbol	[illegible]			
Entity Registrant Name	[illegible]			
Entity Central Index Key	[illegible]			
Current Fiscal Year End Date	--12-31			
Entity Well-known Seasoned Issuer	Yes			
Entity Current Reporting Status	Yes			
Entity Voluntary Filers	No			
Entity Filer Category	Large Accelerated Filer			
Entity Public Float		$ 114,824,568,582		
Entity Common Stock, Shares Outstanding			257,960,636	67,175,694

Compare this modelling above with the previously shown modelling of *document information*, *entity information*, and *entity listing information* and not how those have no empty cells at all.

23.6. Balance sheet

Balance sheets are two independent roll ups: assets, liabilities and equity. Each roll up foots and the two roll ups must be of the same value (i.e. balance sheets balance).

Balance sheets are essentially two roll ups: assets and liabilities & equity. Numerous other components intersect with the balance sheet, which are pointed out below in the key points.

Component: (Network and Table)	
Network	2001 - Statement - Balance Sheet (http://www.abc.com/role/BalanceSheet)
Table	Balance Sheet [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Balance Sheet [Line Items]	Period [Axis]			
	2012-12-31	2011-12-31	2010-12-31	2009-12-31
Assets [Roll Up]				
Current assets [Roll Up]				
Cash, cash equivalents, and marketable securities [Roll Up]				
Cash and cash equivalents	11,000,000	10,000,000	9,000,000	8,000,000
Marketable securities	9,000,000	10,000,000		
Cash, cash equivalents, and marketable securities	20,000,000	20,000,000		
Accounts receivable, net of allowance for doubtful accounts of $1,000 and $1,000	29,000,000	29,000,000		
Inventories	4,000,000	4,000,000		
Prepaid expenses	3,000,000	3,000,000		
Total current assets	56,000,000	56,000,000		
Noncurrent assets [Roll Up]				
Property, plant and equipment, net	82,000,000	82,000,000		
Deferred costs	9,000,000	9,000,000		
Total noncurrent assets	91,000,000	91,000,000		
Total assets	147,000,000	147,000,000		
Liabilities and Equity [Roll Up]				
Current liabilities [Roll Up]				
Accounts payable	3,000,000	3,000,000		
Accrued liabilities	4,000,000	4,000,000		
Current portion of long-term debt	22,000,000	22,000,000		
Product warranty accrual, current portion	26,000,000	26,000,000		
Total current liabilities	55,000,000	55,000,000		
Noncurrent liabilities [Roll Up]				
Product warranty accrual, noncurrent portion	32,000,000	32,000,000		
Long-term debt	19,000,000	19,000,000		
Other	1,000,000	1,000,000		
Total noncurrent liabilities	52,000,000	52,000,000		
Commitments and contingencies	0	0		
Stockholders' Equity [Roll Up]				
Stockholders' equity attributable to parent [Roll Up]				
Preferred stock, $1 par, 10,000 shares authorized, issued and outstanding	10,000,000	10,000,000		
Class A and Class B common stock, $1 par, 110,000 shares authorized (Class A 60,000, Class B 50,000), 90,000 shares issued and outstanding (Class A 50,000, Class B 40,000)	20,000,000	20,000,000		
Additional paid-in capital	1,000,000	1,000,000		
Treasury stock, 10,000 shares	(2,000,000)	(2,000,000)		
Accumulated other comprehensive income	1,000,000	1,000,000		
Retained earnings	6,000,000	6,000,000		
Stockholders' equity attributable to parent	36,000,000	36,000,000		
Stockholders' equity attributable to noncontrolling interest	4,000,000	4,000,000		
Total stockholders' equity	40,000,000	40,000,000	40,000,000	40,000,000
Total liabilities and equity	147,000,000	147,000,000		

Key Points:

- Balance sheets almost universally report "assets" and "liabilities and equity". There are two common exceptions to this rule which are not necessarily violations of the rule, they just tweak the rule slightly. If the net assets approach is used, which tends to be rare in SEC filings, then "assets", "liabilities" and "net assets" are reported rather than "assets" and "liabilities and equity". Some filers only have "Cash and cash equivalents" and therefore do not provide a total for "assets" or "current assets". Some do. How this case should be modeled should be made clearer.
- Balance sheets foot. Assets foot. Liabilities and equity foot.
- Balance sheets balance.
- One of the most common modeling errors when creating a balance sheet is to erroneously mix modeling approaches. Generally balance sheets are modeled by providing a set of [Line Items] for the balance sheet. Some filers sometimes switch to articulating what would be and could be modeled as [Line Items] as [Member]s of an [Axis]. Mixing these approaches is a modeling error.
- One of the more common [Line Items] which causes inappropriate modeling is common stock when a reporting entity has more than one class of common stock. In the modeling above, note that there are two classes of stock; but the balance sheet still foots. This modeling approach is copied from Google's approach to modeling two classes of common stock. See the HINT related to modeling classes of stock below.
- While all balance sheets have assets, a majority have current assets and current liabilities. While there is a domain business rule that balance sheets have assets; there is an industry business rule which says that specific industries provide a classified balance sheet and therefore report current assets and liabilities while other reporting entities in other industries report unclassified balance sheets and do not.
- FASB CON 6 defines the elements of a financial report and one of those elements is "equity". Equity can take many different forms such as stockholders equity, owners equity, partner capital, member equity; but all of those concepts are equity which are just labeled differently for different types of reporting entities.
- Equity does not change depending on whether a reporting entity has or does not have a noncontrolling interest. What does change if a reporting entity has a noncontrolling interest is the reporting of the subtotal "Equity attributable to parent". (This reasoning contradicts XBRL US' best practice.)

Business Rules:

- Assets exists on the balance sheet.
- Liabilities and equity exists on the balance sheet.
- Assets = Liabilities and equity.
- Assets foot.

- Liabilities and equity foot.
- Equity exists on the balance sheet.

QUESTION: Why is it that XBRL US decided that if noncontrolling interest exists, then the concept which represents equity changes; yet the concept "Assets" does not change if there is or if there is not a current/noncurrent breakdown? Also, how do you keep filers from accidentally switch the two equity concepts and use them backwards?

HINT: Approaches for providing details of balance sheet items.

There are two approaches for providing details of balance sheet items.

The first is to create one or more [Line Items] which are used to articulate those detailed items. An example of this approach is provided in the inventory components component of this reference model.

The second is to create an [Axis] which is used to express the "types" or "classes" of the detailed items, [Member]s for each type/class, and only one [Line Item] which is used by each of those types/classes. An example of this approach is the property, plant, and equipment components.

Each approach has its set of pros and cons. In general, the use second approach whereby an [Axis] and a set of [Member]s provides the better functionality, all things considered. There are occasions when all that functionality is not necessary. However, using only one approach also has its benefits.

Currently, the US GAAP Taxonomy uses both approaches and sometimes at the seam time. There is no clarity as to which approach should be used when. Therefore the US GAAP Taxonomy can be considered inconsistent in this regard.

NOTE: There is a third approach to achieving this result also which is not allowed by the US GAAP Taxonomy Architecture but to be complete, it will be mentioned here. That approach is to use tuples to provide detailed items. The primary reason for mentioning this approach is to point out that (a) XBRL Global Ledger is based on this approach and (b) the [Axis]/[Member] approach could achieve the same thing as XBRL Global Ledger.

HINT: Equity does not change if you do or do not have a noncontrolling interest.

FASB Con 6 defines the elements of a financial report and one of those elements is equity. Based on a best practice articulated by XBRL US, equity changes depending whether a reporting entity does, or does not, have a noncontrolling interest.

Another way to look at this situation is to view "equity" as not changing and view the situation as providing a subtotal for "equity attributable to parent" as a concept which should be added to a financial report should the concept "equity attributable to noncontrolling interest" should be required. This approach certainly cannot be considered wrong.

In fact, there are two specific reasons why the notion that equity should NOT be allowed to change is a better approach. The first reason is to model a financial report without a noncontrolling interest, and then add a noncontrolling interest and notice all the pieces of the model which would need to change. The second is ability to reverse the total equity concept and the equity attributable to parent concept, basically using them backwards.

If a simple business rule were created "equity must exist" and then enforced, the potential to accidentally reverse these concepts essentially becomes zero. Whereas, simply trying to write that business rule given XBRL US' best practice provides yet and additional clue that this best practice is not the best approach.

NOTE: The reason that this point is important is that it impacts many, many other areas of the taxonomy and how things should be modelled. It is reasonably easy to overcome this poor choice; but to have to modify software to deal with this type of situation over, and over, and over should be avoided in my view. It seems that people who set these rules don't understand these sorts of ramifications of the decisions they are making.

23.7. Balance sheet parenthetical, general

Balance sheet parenthetical information can be grouped together into related groups, all the information is not related other than the fact that each component is parenthetical information related to the balance sheet. General parenthetical information here contains only one fact, allowance for doubtful accounts.

Component: (Network and Table)	
Network	2002 - Statement - Balance Sheet Parenthetical, General (http://www.abc.com/role/BalanceSheetParentheticalGeneral)
Table	Balance Sheet Parenthetical, General [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Balance Sheet Parenthetical, General [Line Items]	Period [Axis]	
	2012-12-31	2011-12-31
Balance Sheet Parenthetical General [Hierarchy]		
Allowance for doubtful accounts	1,000,000	1,000,000

Key Points:

- Concept is a hierarchy.
- Numerous different concept might exist.

Business Rules:

- If trade receivables exists, then an allowance for doubtful accounts must exist.

23.8. Balance sheet parenthetical, preferred stock

Preferred stock parenthetical information is numerous facts all of which relate to preferred stock. (Note that common stock and preferred stock are in no way related and should not be modelled together.)

Component: (Network and Table)	
Network	2003 - Statement - Balance Sheet Parenthetical, Preferred Stock (http://www.abc.com/role/BalanceSheetParentheticalPreferredStock)
Table	Stock by Class [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Class of Stock [Line Items]	Period [Axis]			
	2012-12-31		2011-12-31	
	Class of Stock [Axis]		Class of Stock [Axis]	
	Preferred Class A [Member]	Class of Stock [Domain]	Preferred Class A [Member]	Class of Stock [Domain]
Class of Preferred Stock [Hierarchy]				
Par value	1.00			
Shares authorized	10,000			
Shares issued	10,000			
Shares outstanding	10,000			
Preferred stock amount outstanding	10,000,000	10,000,000	10,000,000	10,000,000

Key Points:

- Component is a hierarchy.
- The component intersects with the balance sheet amount of preferred stock outstanding.

Business Rules:

- The class of preferred stock must exist and is articulated using an [Axis].
- Par value (if appropriate), shares authorized, shares issued, shares outstanding, and amount must each exist.
- Shares authorized must be greater than or equal to the amount issued.
- Shares issued must be greater than or equal to the amount outstanding.
- Amount of each class must foot to total of all classes.

23.9. Balance sheet parenthetical, common stock

Common stock parenthetical information is numerous facts all of which relate to preferred stock.

Component: (Network and Table)	
Network	2004 - Statement - Balance Sheet Parenthetical, Common Stock (http://www.abc.com/role/BalanceSheetParentheticalCommonStock)
Table	Stock by Class [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Class of Stock [Line Items]	Period [Axis]					
	2012-12-31			2011-12-31		
	Class of Stock [Axis]			Class of Stock [Axis]		
	Common Class A [Member]	Common Class B [Member]	Class of Stock [Domain]	Common Class A [Member]	Common Class B [Member]	Class of Stock [Domain]
Class of Common Stock [Hierarchy]						
Par value	1.00	1.00				
Shares authorized	60,000	50,000				
Shares issued	50,000	40,000				
Shares outstanding	50,000	40,000				
Common stock amount outstanding	10,000,000	10,000,000	20,000,000	10,000,000	10,000,000	20,000,000

Key Points:

- Component is a hierarchy.
- The component intersects with the balance sheet amount of common stock outstanding.

Business Rules:

- The class of common stock must exist and is articulated using an [Axis].
- Par value (if appropriate), shares authorized, shares issued, shares outstanding, and amount must each exist.
- Shares authorized must be greater than or equal to the amount issued.
- Shares issued must be greater than or equal to the amount outstanding.
- Amount of each class must foot to total of all classes.

23.10. Balance sheet parenthetical, treasury stock

Treasury stock parenthetical information is numerous facts all of which relate to treasury stock.

Component: (Network and Table)	
Network	2005 - Statement - Balance Sheet Parenthetical, Treasury Stock (http://www.abc.com/role/BalanceSheetParentheticalTreasuryStock)
Table	Class of Treasury Stock [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Equity, Class of Treasury Stock [Line Items]	Period			
	2012-12-31		2011-12-31	
	Class of Stock [Axis]		Class of Stock [Axis]	
	Common Class A [Member]	Class of Stock [Domain]	Common Class A [Member]	Class of Stock [Domain]
Class of Treasury Stock [Hierarchy]				
Shares	10,000			
Treasury stock amount	2,000,000	2,000,000	2,000,000	2,000,000

Key Points:

- Component is a hierarchy.
- The component intersects with the balance sheet amount of treasury stock outstanding.

Business Rules:

- Amount must exist.
- Shares must exist.
- Amount of all classes must foot.

QUESTION: Currently, there is only one axis for all stock, "Class of Stock [Axis]", and that is used for preferred, common, and treasury stock. Is this appropriate, or should each type of stock have its own axis; "Class of Preferred Stock [Axis]", "Class of Common Stock [Axis]", "Class of Treasury Stock [Axis]"? What is the general rule which should be applied as to when one [Axis] should be created and shared as opposed to when multiple [Axis] created. For example, why does property, plant, and equipment have its own [Axis] (Property, Plant and Equipment Type [Axis]), cash and cash equivalents have its own [Axis] (Cash and Cash Equivalents Type [Axis]), marketable securities have a more general [Axis] (Instrument [Axis]). What is the general rule?

QUESTION: If you consider the component for common stock you will note that there are two classes of common stock. The sum of the amount of both classes of common stock foots to the total amount for all classes which ties to the balance sheet. If you contrast this to preferred stock which has one class this is modeled precisely the same way. However, what if there were only one class of common stock? How would, or should, the modeling change? Why would the modeling change. What I mean is that if there is only one class of stock, it seems to be implied that the "domain" and the "class of stock" are the same thing. This assumption would need to be stated for every case where there is some "list" and that list has only one member. By contrast, if one models this as this

reference model has modeled this information, there is no need for making any specific assumption and all components of the US GAAP taxonomy or any financial report created using the US GAAP taxonomy would each work in exactly the same way. Certainly the modeling approached used by this reference model cannot be considered wrong. The question is, should the approach most filers seem to use be considered right? It is not a question that it is or is not considered "right" currently; but rather is this a good approach, all things considered?

23.11. Income statement

Income statements are four components. The first component is a roll up of net income (loss). The second is a roll up (breakdown) of net income (loss) between the amount attributable to the parent company and the amount attributable to a noncontrolling interest. The third section is a hierarchy of net income per share information. The forth is a hierarchy of weighted average share information.

Component: (Network and Table)	
Network	2006 - Statement - Income Statement (http://www.abc.com/role/IncomeStatement)
Table	Income Statement [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Income Statement [Line Items]	Period		
	2012-01-01 - 2012-12-31	2011-01-01 - 2011-12-31	2010-01-01 - 2010-12-31
Net Income (Loss) [Roll Up]			
Income from Continuing Operations Before Tax [Roll Up]			
Operating Income (Loss) [Roll Up]			
Gross Profit [Roll Up]			
Revenues	10,000,000	10,000,000	10,000,000
Cost of revenues	4,000,000	4,000,000	4,000,000
Gross profit	6,000,000	6,000,000	6,000,000
Operating Expenses [Roll Up]			
Selling, general and administrative expenses	1,000,000	1,000,000	1,000,000
Research and development expenses	500,000	500,000	500,000
Marketing expense	250,000	250,000	250,000
Other operating cost and expenses	100,000	100,000	100,000
Total operating expenses	1,850,000	1,850,000	1,850,000
Operating income (loss)	4,150,000	4,150,000	4,150,000
Foreign currency transaction gain (loss), before tax	200,000	(200,000)	200,000
Interest income	5,000,000	6,000,000	7,000,000
Interest expense	(3,000,000)	(2,000,000)	(4,000,000)
Other nonoperating income (expenses)	1,000,000	2,000,000	(3,000,000)
Income (loss) from continuing operations before taxes	7,350,000	9,950,000	4,350,000
Provision for income taxes	2,000,000	2,500,000	3,000,000
Net income (loss)	5,350,000	7,450,000	1,350,000
Net Income (Loss) Attributable to [Roll Up]			
Net income (loss) attributable to parent	4,815,000	6,705,000	1,215,000
Net income (loss) attributable to noncontrolling interest	535,000	745,000	135,000
Net income (loss)	5,350,000	7,450,000	1,350,000
Earnings Per Share [Hierarchy]			
Basic	96.30	134.10	24.30
Diluted	53.50	74.50	13.50
Weighted average common shares outstanding [Hierarchy]			
Basic	50,000	50,000	50,000
Diluted	90,000	90,000	90,000

Key Points:

- Component is a roll up.
- Net income must exist (although based on current practices this could take a number of different forms, unsure if this is a good or bad thing).
- Additionally, hierarchies are provided for net income per share and weighted average common shares outstanding.
- The breakdown for net income attributable to parent and noncontrolling interest is a roll up

Business Rules:

- Net income must exist.
- Net income must foot.
- Earnings per share must exist.

QUESTION: The IFRS taxonomy provides the concept which is similar to "Net income attributable to noncontrolling interest" as a credit, whereas the US GAAP taxonomy provides this concept as a debit. It is not logical that these two taxonomies would or should do this differently. The modeling of the breakdown of net income to the parent and noncontrolling interest can logically be modeled as it is above, or similar to the approach used on the statement of comprehensive income. It is unclear how the modeling of net income attributable to noncontrolling interest impacts other things such as the statement of changes in equity. (I don't understand all the moving pieces here to be 100% sure I am seeing this correctly.)

QUESTION: Why would the concept which represents net income change depending on whether a reporting entity has or does not have a noncontrolling interest or preferred stock? This is not the same question as to whether a separate concepts are needed to articulate such a breakdown, this question relates to trying to issues related to comparing or obtaining the correct concept which expresses net income for a reporting entity.

23.12. Statement of comprehensive income

Statements of comprehensive income are two components. The first is a roll up of comprehensive income (loss). The second is a roll up (breakdown) of comprehensive income (loss) between the amount attributable to the parent and to the noncontrolling interest.

Component: (Network and Table)	
Network	2007 - Statement - Comprehensive Income (http://www.abc.com/role/ComprehensiveIncome)
Table	Comprehensive Income [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Comprehensive Income [Line Items]	Period		
	2012-01-01 - 2012-12-31	2011-01-01 - 2011-12-31	2010-01-01 - 2010-12-31
Comprehensive Income Attributable to Parent [Roll Up]			
Comprehensive Income [Roll Up]			
Net income (loss)	5,350,000	7,450,000	1,350,000
Other comprehensive income [Roll Up]			
Change in foreign currency translation adjustment	3,650,000	1,550,000	7,650,000
Other comprehensive income (loss)	3,650,000	1,550,000	7,650,000
Comprehensive income (loss)	9,000,000	9,000,000	9,000,000
Noncontrolling interest	2,000,000	5,000,000	5,000,000
Parent	7,000,000	4,000,000	4,000,000

Key Points:

- Component is a roll up.
- Component intersects with the income statement (net income (loss)) and statement of changes in equity (other comprehensive income).

Business Rules:

- Other comprehensive income must exist.
- Comprehensive income must exist.
- Other comprehensive income must foot.
- Comprehensive income must foot.

23.13. Cash flow statement

Cash flow statements are three components. The first is a roll up of net cash flow which must foot. The second is a roll forward of cash and cash equivalents which should both reconcile and tie to the balance sheet. The third is a hierarchy of supplemental cash flow disclosures.

Component: (Network and Table)	
Network	2008 - Statement - Cash Flow Statement (http://www.abc.com/role/CashFlowStatement)
Table	Cash Flow Statement [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Cash Flow Statement [Line Items]	Period		
	2012-01-01 - 2012-12-31	2011-01-01 - 2011-12-31	2010-01-01 - 2010-12-31
Cash and Cash Equivalents [Roll Forward]			
Net Increase (Decrease) in Cash and Cash Equivalents [Roll Up]			
Operating activities [Roll Up]			
Net income (loss)	5,350,000	7,450,000	1,350,000
Adjustments to reconcile to cash provided by operations [Roll Up]			
Noncash charges and credits [Abstract]			
Depreciation	500,000	500,000	500,000
Deferred income tax	80,000	80,000	80,000
Other noncash charges and credits	(10,000)	(10,000)	(10,000)
Changes in working capital items [Abstract]			
Accounts receivable	0	0	0
Inventories	0	0	0
Accounts payable	0	0	0
Accrued liabilities	0	0	0
Product warranty accrual	0	0	0
Adjustments to reconcile to cash provided by operations	570,000	570,000	570,000
Cash provided by operating activities	5,920,000	8,020,000	1,920,000
Investing activities [Roll Up]			
Payments to acquire property, plant and equipment	(10,000,000)	(10,000,000)	(10,000,000)
Proceeds from sale of property, plant, and equipment	23,000,000	20,000,000	27,160,000
Other investing activities	2,000,000	2,000,000	2,000,000
Cash provided by (used in) investing activities	15,000,000	12,000,000	19,160,000
Financing activities [Roll Up]			
Proceeds from issuance of long-term debt	20,000,000	20,000,000	20,000,000
Repayments of long-term debt	(32,000,000)	(32,000,000)	(32,000,000)
Payment of common stock dividends	(9,000,000)	(9,000,000)	(9,000,000)
Other financing activities	1,000,000	1,000,000	1,000,000
Cash provided by (used in) financing activities	(20,000,000)	(20,000,000)	(20,000,000)
Effect of exchange rate on cash and cash equivalents	80,000	980,000	(80,000)
Net increase (decrease) in cash and cash equivalents	1,000,000	1,000,000	1,000,000
Cash and cash equivalents, beginning balance	10,000,000	9,000,000	8,000,000
Cash and cash equivalents, ending balance	11,000,000	10,000,000	9,000,000
Supplemental cash flow disclosures [Hierarchy]			
Interest paid	500,000	500,000	500,000
Income taxes paid	1,000,000	1,000,000	1,000,000

Key Points:

- Component is a roll forward of cash and cash equivalents with an embedded roll up which aggregates all of the concepts which make up the change, or net cash flow, of the roll forward.
- Additionally, the supplemental cash flow disclosures is a hierarchy.
- Cash and cash equivalents intersects with the balance sheet.
- Net income intersects with the income statement.
- Numerous other intersections exist.

Business Rules:

- Some concept for cash and cash equivalents must exist.
- Net cash flow must exist.
- Generally, cash flows from operating, investing, and financing activities all exist; however, one or more of those categories might not exist if the reporting entity has no activities in those areas.
- Roll up of net cash flow must foot.
- Roll forward of cash and cash equivalents must foot.
- Changes in working capital items must reconcile with changes in related balance sheet item.

QUESTION: Why would the concept "net cash flow" change if the balance sheet account which is used for cash changes? Generally, most filers us "Cash and cash equivalents" and "Cash and cash equivalents, period increase (decrease)" or us-gaap:CashAndCashEquivalentsPeriodIncreaseDecrease. However, other filers simply use "Cash" on the cash flow statement and balance sheet and still use the concept named us-gaap:CashAndCashEquivalentsPeriodIncreaseDecrease, yet others use us-gaap:CashPeriodIncreaseDecrease. This is somewhat like changing the concept "Assets" depending upon which set of balance sheet line items which exist. Is this necessary? Is it appropriate? Why the need to differentiate what amounts to net cash flow depending on what the cash account is? You know what the cash account is by simply looking at the cash account.

23.14. Prior period adjustment

Focusing on the prior period adjustment for a moment you will note that a prior period adjustment reconciles an originally stated balance as of a specific balance sheet date to a restated balance as of that same balance sheet date. What changes between the originally stated and restated balance is the report date associated with the fact.

Component: (Network and Table)	
Network	2009 - Statement - Prior Period Adjustment (http://www.abc.com/role/PriorPeriodAdjustment)
Table	Changes in Stockholders' Equity [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Changes in Stockholders' Equity [Line Items]	Report Date [Axis]	Period			
		2012-12-31	2011-12-31	2010-12-31	2009-12-31
Stockholders' equity, origionally stated	Origionally Stated Report Date [Member]		40,000,000		
	Restated Report Date [Domain]	40,000,000	40,000,000	40,000,000	40,000,000
Correction of a prior period error	Restated Report Date [Domain]		2,000,000		
Effect of mandatory change in accounting policy for adoption of FAS XXX	Restated Report Date [Domain]		(2,000,000)		
Stockholders' equity, restated	Origionally Stated Report Date [Member]		40,000,000		
	Restated Report Date [Domain]	40,000,000	40,000,000	40,000,000	40,000,000

[CSH: This rendering is not correct]

Key Points:

- Component is an adjustment. (Recall that an adjustment reconciles an originally stated balance to a restated balance.)
- The balance being reconciled, in this case retained earnings, is always required to exist.
- The characteristic of retained earnings which changes in this adjustment is its report date. The originally stated balance is as of one report date, the adjustments and the restated balance are as of a different report date.
- Although the presentation of an adjustment looks similar to that of a roll forward, the dynamics of the facts is different. In a roll forward, it is the period of the reconciling item which changes, rather than the report date as is the case within and adjustment.

Business Rules:

- The concept being adjusted, in this case retained earnings, is required to exist within the component.

- The adjustment is required to properly reconcile (i.e. originally stated balance + adjustments = restated balance).

23.15. Total stockholders' equity

Focusing on a single piece of the entire statement of changes in equity, total stockholders' equity, note that a change in equity is a roll forward. The entire statement of changes in equity is nothing more than a number of roll forwards, one for item contained within equity on the balance sheet. Additionally, roll forwards are provided for changes in share amounts, where appropriate. Whether the statement of equity is presented vertically or horizontally does not change the model.

Component: (Network and Table)	
Network	2010 - Statement - Changes in Total Stockholders' Equity (http://www.abc.com/role/ChangesInTotalStockholdersEquity)
Table	Changes in Stockholders' Equity [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Changes in Stockholders' Equity [Line Items]	Period		
	2012-01-01 - 2012-12-31	2011-01-01 - 2011-12-31	2010-01-01 - 2010-12-31
Increase (Decrease) in Stockholders' Equity [Roll Forward]			
Stockholders' equity, beginning balance	40,000,000	40,000,000	40,000,000
Net income (loss)	5,350,000	7,450,000	1,350,000
Dividends	(9,000,000)	(9,000,000)	(9,000,000)
Other comprehensive income (loss)	3,650,000	1,550,000	7,650,000
Stockholders' equity, ending balance	40,000,000	40,000,000	40,000,000

Key Points:

- Component is a roll forward.
- The concept total stockholders' equity ties to the balance sheet.

Business Rules:

- The concept being rolled forward, in this case total stockholders' equity, must exist.
- The roll forward must properly reconcile.

23.16. Statement of changes in equity

[CSH: This statement is not complete yet.]

Statements of changes in equity are a set of multiple roll forwards each of which ties to the balance sheet equity section except for the share roll forwards.

	Preferred stock	Class A common stock	Class B common stock	Additional paid-in capital	Treasury stock	Accumulated other compre-hensive income	Retained earnings	Stockholders' equity attributable to parent	Stockholders' equity attributable to non-controlling interest	Stockholders' equity
Balance, December 31, 2009	$ 10,000	$ 10,000	$ 10,000	$ 1,000	$ (2,000)	$ 1,000	$ 6,000	$ 36,000	$ 4,000	$ 40,000
Net income							1,350	1,350	3,000	1,350
Dividends							(9,000)	(9,000)		(9,000)
Other comprehensive income (loss)						1,000				7,650
Balance, December 31, 2010, originally stated	10,000	10,000	10,000	1,000	(2,000)	2,000	(1,650)	28,350	7,000	40,000
Correction of prior period error							2,000	2,000	—	2,000
Effect of voluntary change in accounting policy							(2,000)	(2,000)		(2,000)
Balance, December 31, 2010, restated	10,000	1,000	1,000	1,000	(2,000)	2,000	(1,650)	28,350	7,000	40,000
Net income							1,350	1,350	3,000	7,450
Dividends							(9,000)	(9,000)		(9,000)
Other comprehensive income (loss)						1,000				1,550
Balance, December 31, 2011	10,000	1,000	1,000	1,000	(2,000)	3,000	(9,300)	20,700	10,000	40,000
Net income							1,350	1,350	3,000	5,350
Dividends							(9,000)	(9,000)		(9,000)
Other comprehensive income (loss)						1,000				3,650
Balance, December 31, 2012	$ 10,000	$ 1,000	$ 1,000	$ 1,000	$ (2,000)	$ 4,000	$ (16,950)	$ 13,050	$ 13,000	$ 40,000

Additionally, in the rare case where a prior period adjustment exists, a statement of changes in equity also can contain an adjustment which reconciles the originally stated balance to the restated balance for certain specific accounts.

As roll forwards and prior period adjustments are significantly different from a modelling perspective, they are shown separately. From a presentation perspective these can be combined.

Here is a statement of changes in equity presented with the balance sheet equity accounts across the top and the changes to those accounts presented within the rows of the presentation. Alternatively, statements of changes in equity are sometimes presented with the changes across the top and the balance sheet equity accounts within the rows of the presentation. There are other ways to present this statement. How the statement is presented does not impact the model of the component.

This statement of changes in equity is a set of 10 roll forwards, one for each item within the equity section of the balance sheet.

Key Points:

- Component is a set of individual roll forwards. Additionally, a set of adjustment components also exists to model this statement of changes in equity presentation.

- The roll forwards tie together as do the items which make up the equity section of the balance sheet, which is a roll up. It is that roll up which ties together each set of balances for each period.
- Net income attributable to parent, net income attributable noncontrolling interest, and total net income per the income statement is the identical fact which is reported on the income statement.
- Other comprehensive income in total, attributable to parent, and attributable to noncontrolling interest is the same facts which exist on the statement of comprehensive income.

Business Rules:

- Each concept for each individual roll forward which is being rolled forward must exist.
- Each roll forward must reconcile correctly (i.e. in the presentation above, each roll forward must foot).
- All roll forward information must cross cast (i.e. the roll up for each item shown in the visual presentation must add up correctly).

HINT: Most statements of changes in equity are incorrectly modelled.

Most SEC XBRL financial reports have statements of changes in equity which are incorrectly modelled which result in duplicate concepts. This is particularly true if the reporting entity has a noncontrolling interest.

23.17. Nature of business

Nature of business is a hierarchy of generally one and perhaps more facts. In this case there is one fact. Nature of business is not a significant accounting policy, although many reporting entities combine the two disclosures from a presentation perspective.

Component: (Network and Table)	
Network	4010 - Disclosure - Nature of Business (http://www.abc.com/role/NatureOfBusiness)
Table	Nature of Business [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Nature of Business [Line Items]	Period 2012-01-01 - 2012-12-31
Nature of business [Text Block]	Duis fermentum. Nullam dui orci, scelerisque porttitor, volutpat a, porttitor a, enim. Sed lobortis. Maecenas scelerisque ullamcorper libero. Aliquam porta leo imperdiet pede. In semper, elit vel elementum auctor, lectus purus rhoncus arcu, lacinia sollicitudin justo odio et nunc. Phasellus sagittis fringilla risus. Curabitur iaculis sagittis orci. Ut malesuada libero nec nulla molestie vestibulum. Suspendisse lectus massa, ullamcorper at, tincidunt eget, bibendum vel, risus. Curabitur imperdiet. Suspendisse accumsan, arcu vel ornare interdum, magna tellus porta mauris, in porta mi lacus sodales felis. Pellentesque dapibus, leo non sollicitudin consequat, lectus orci fringilla felis, non interdum leo libero sed augue. Sed magna. Maecenas ante ipsum, congue ut, sodales a, pulvinar ut, dui. Suspendisse mauris massa, sollicitudin et, hendrerit eget, placerat id, orci. Donec molestie magna. Sed mauris. Nulla facilisi. Fusce tristique posuere ipsum. Nulla facilisi. Aliquam viverra risus vitae ante. Sed rhoncus mi in wisi. Nullam nibh dui, molestie vitae, imperdiet non, ornare at, elit. Aenean nec justo. Vestibulum ante ipsum primis in faucibus orci luctus et ultrices posuere cubilia Curae; Duis sodales.

Key Points:

- Component is a text block or single reported fact.
- Nature of business is not a significant accounting policy.

Business Rules:

- Nature of business is a required disclosure.

HINT: Organization, Consolidation and Presentation of Financial Statements Disclosure and Significant Accounting Policies; Combining Disclosure Facts.

The US GAAP Taxonomy provides a concept "Organization, Consolidation and Presentation of Financial Statements Disclosure and Significant Accounting Policies [Text Block]" which, in essence, combines multiple disclosures into one fact. The taxonomy also provides numerous permutations and combinations of the many possible ways to combine this, and many other disclosures (i.e. this is only provided as an example of a more generally occurring theme). This approach is likely used because, in practice, many reporting entities do in fact combine this information from a presentation perspective in multiple different ways. This applies to textual-type disclosures and numeric-type disclosures and even line items which appear on the primary financial statements.

Is this a desired approach? Is this approach optimal for use of the information by analysts which desire to consume a financial report? An alternative approach is to not make the multiple permutations and combinations available in the US GAAP Taxonomy and make only the specific disclosures available and no matter how they are combined for presentation purposes; digital disclosure of the information would provide only the pieces which users of the information can combined how they see fit.

This idiosyncrasy is a characteristic of digital financial reporting or reporting information in a structured way. Contrasting this to disclosing information in an unstructured way (really more structured for presentation but not structured from the disclosure perspective). What this means is that accountants can be forced to put information into some sort of specific "box". If this is not done appropriately the richness and perhaps even the meaning of the information could be limited or even change.

How to approach this issue is a choice the accounting profession and others within the financial reporting supply chain will need to grapple with and decide what is best, all things considered. Today, the choice which has been made is to provide as many permutations and combinations as possible; this choice is reflected in the current instantiation of the US GAAP Taxonomy. How reporting entities use the US GAAP Taxonomy, however, is also a choice reporting entities must make.

23.18. Significant accounting policies

Significant accounting policies is a hierarchy of facts related only in that they are accounting policies disclosed by a reporting entity. Policies can be put into two groups: one fact to one policy and multiple facts to one policy. Here is a set of policies which is a hierarchy of individual policies:

Component: (Network and Table)	
Network	4020 - Disclosure - Significant Accounting Policies (http://www.abc.com/role/SignificantAccountingPolicies)
Table	Significant Accounting Policies [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Significant Accounting Policies [Line Items]	Period 2012-01-01 - 2012-12-31
Cash and cash equivalents policy [Text Block]	Proin elit sem, ornare non, ullamcorper vel, sollicitudin a, lacus. Mauris tincidunt cursus est. Nulla sit amet nibh. Sed elementum feugiat augue. Nam non tortor non leo porta bibendum. Morbi eu pede.
Receivables policy [Text Block]	Proin elit sem, ornare non, ullamcorper vel, sollicitudin a, lacus. Mauris tincidunt cursus est. Nulla sit amet nibh. Sed elementum feugiat augue. Nam non tortor non leo porta bibendum. Morbi eu pede. Proin elit sem, ornare non, ullamcorper vel, sollicitudin a, lacus. Mauris tincidunt cursus est. Nulla sit amet nibh. Sed elementum feugiat augue. Nam non tortor non leo porta bibendum. Morbi eu pede.
Inventories policy [Text Block]	Mauris tincidunt cursus est. Nulla sit amet nibh. Sed elementum feugiat augue. Nam non tortor non leo porta bibendum. Morbi eu pede.Proin elit sem, ornare non, ullamcorper vel, sollicitudin a, lacus.
Debt policy [Text Block]	Pellentesque condimentum commodo wisi. Fusce gravida, ligula a placerat placerat, leo erat euismod lectus, et lacinia justo libero non pede. Vivamus ac velit vel magna nonummy pretium.
Revenue recognition policy [Text Block]	Nulla facilisi. Aliquam viverra risus vitae ante. Sed rhoncus mi in wisi.

Key Points:

- Component is a hierarchy.
- The list of policies, in this case, is simply a flat list. The policies could have sub-hierarchies or groupings within sections of the financial report presentation.
- While there is a relation between the balance sheet item "Cash and cash equivalents" and the "Cash and cash equivalents policy", there is no physical relation expressed in the US GAAP taxonomy or in financial reports. The same is true for other policies.
- By contrast, there is a physical relation between the next component, "Property, plant and equipment policy" and the items which make up the classes of property, plant, and equipment. This relation is indicated via the "Property, Plant, and Equipment Type [Axis]". This is one of the primary benefits of modeling information as [Member]s of an [Axis] as compared to as concepts within a set of [Line Items].

Business Rules:

- If the item cash and cash equivalents exist on the balance sheet, then it is likely that the policy for that component likely should also exist. The same is true for other policies.
- Revenue recognition policy is required to be provided.

23.19. Property, plant and equipment policies

By contrast, this property, plant and equipment policy is comprised of multiple facts which work together to make up that disclosure. These disclosures are tied together via the "Property, Plant and Equipment Type [Axis]" which distinguishes which valuation basis, depreciation method, estimated useful life, and disclosure policy relates to which class of property, plant, and equipment.

Component: (Network and Table)	
Network	4030 - Disclosure - Property, Plant and Equipment Policies (http://www.abc.com/role/PropertyPlantAndEquipmentPolicies)
Table	Property, Plant and Equipment Components [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Period	2012-01-01 - 2012-12-31
Legal Entity [Axis]	Consolidated Entity [Domain]

Property, Plant and Equipment [Line Items]	Property, Plant and Equipment, Type [Axis]		
	Land [Member]	Machinery and equipment [Member]	Furniture and fixtures [Member]
Property, Plant and Equipment Policies [Hierarchy]			
Basis of valuation	Mauris tincidunt cursus	Mauris tincidunt cursus	Mauris tincidunt cursus
Depreciation methods		Sed elementum feugiat	Mauris tincidunt
Estimated useful lives		15 years	5 years
Dispositions policy	Nam non tortor	Nam non tortor	Nam non tortor

Key Points:

- Component is a hierarchy.
- The five concepts within the set of [Line Items] which are included within the hierarchy are tied together via the Property, Plant and Equipment Type [Axis] and its related [Member]s.
- Likewise, these same five concepts in this component can be physically combined with the [Line Item]s can be combined with the single concept in the set of [Line Items] within the "Property, Plant and Equipment Components" component. Again, it is the Property, Plant and Equipment Type [Axis] and its related [Member]s which provides this physical connection.
- Software may not take advantage of this feature currently, but as software matures, software will leverage this feature.

Business Rules:

- Valuation basis is required for all [Member]s.
- Depreciation method, and estimated useful life is required for all [Member]s other than Land.

23.20. Cash, cash equivalents, and marketable securities details

Cash, cash equivalents, and marketable securities components are three separate models which work together to disclose their components. The first component is a roll up of total cash, cash equivalents, and marketable securities which is best seen by viewing the balance sheet.

Cash, cash equivalents, and marketable securities [Roll Up]				
Cash and cash equivalents	11,000,000	10,000,000	9,000,000	8,000,000
Marketable securities	9,000,000	10,000,000		
cash equivalents, and marketable securiti	20,000,000	20,000,000		

Component: (Network and Table)	
Network	5010 - Disclosure - Cash, Cash Equivalents, and Marketable Securities (http://www.abc.com/role/CashCashEquivalentsAndMarketableSecurities)
Table	Cash, Cash Equivalents, and Marketable Securities [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Cash, Cash Equivlents, and Marketable Securities [Line Items]	Period			
	2012-12-31	2011-12-31	2010-12-31	2009-12-31
Cash, Cash Equivalents, and Marketable Securities [Roll Up]				
Cash and cash equivalents	11,000,000	10,000,000	9,000,000	8,000,000
Marketable securities	9,000,000	10,000,000		
Cash, cash equivalents, and marketable securities	20,000,000	20,000,000		

The second and third are two member aggregations, the first for total cash and cash equivalents and the second for total marketable securities. Each of the member aggregations ties to and intersects with the corresponding balance sheet fact as shown above. The balance sheet roll up is repeated in the disclosure to tie the two member aggregations to the grand total, "Total cash, cash equivalents, and marketable securities.

Cash and cash equivalents components

Component: (Network and Table)	
Network	5020 - Disclosure - Cash and Cash Equivalents Components (http://www.abc.com/role/CashAndCashEquivalentsComponents)
Table	Cash and Cash Equivalents Components [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Cash and Cash Equivalents [Line Items]	Period														
	2012-12-31							2011-12-31							2010-12-31	2009-12-31
	Cash and Cash Equivalents Type [Axis]							Cash and Cash Equivalents Type [Axis]							Cash and Cash Equivalents Type [Axis]	Cash and Cash Equivalents Type [Axis]
	Cash [Member]	Bank time deposits [Member]	Money market funds [Member]	U.S. government agencies securities [Member]	Foreign government debt [Member]	Corporate debt securities [Member]	Cash and Cash Equivalents, All Types [Domain]	Cash [Member]	Bank time deposits [Member]	Money market funds [Member]	U.S. government agencies securities [Member]	Foreign government debt [Member]	Corporate debt securities [Member]	Cash and Cash Equivalents, All Types [Domain]	Cash and Cash Equivalents, All Types [Domain]	Cash and Cash Equivalents, All Types [Domain]
Cash and Cash Equivalents [Hierarchy]																
Cash and cash equivalents	4,000,000	2,000,000	3,000,000	500,000	300,000	1,200,000	11,000,000	4,000,000	1,000,000	2,000,000	500,000	0	2,500,000	10,000,000	9,000,000	8,000,000

Marketable securities components

Component: (Network and Table)	
Network	5030 - Disclosure - Marketable Securities Components (http://www.abc.com/role/MarketableSecuritiesComponents)
Table	Marketable Securities [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Marketable Securities [Line Items]	Period											
	2012-12-31						2011-12-31					
	Instrument Type [Axis]						Instrument Type [Axis]					
	Bank time deposits [Member]	U.S. government agencies securities [Member]	Foreign government debt [Member]	Municipal securities [Member]	Marketable equity securities [Member]	Instruments, All Types [Domain]	Bank time deposits [Member]	U.S. government agencies securities [Member]	Foreign government debt [Member]	Municipal securities [Member]	Marketable equity securities [Member]	Instruments, All Types [Domain]
Marketable Securities [Hierarchy]												
Marketable securities	300,000	3,000,000	1,200,000	2,500,000	2,000,000	9,000,000	400,000	4,000,000	1,600,000	1,000,000	3,000,000	10,000,000

Key Points:

- The components of both "Total cash and cash equivalents" and "Total marketable securities" are detailed using member aggregations.
- Each of the two member aggregations of components ties to the corresponding concept in the roll up, which also provides a grand total.
- Note that alternatively, each of the member aggregations could have been modeled using concepts within a set of [Line Items].
- Because of the presentation layout there might be a temptation to model "Cash" as an item. However, this would not be appropriate as the model would not work correctly. Cash is simply a type of cash and cash equivalents.
- Note the item of cash and cash equivalents "Foreign government debt" and that the fact value is zero for 2011. As the item is provided for 2012, it is appropriate to have a fact value for 2011. The fact value is not "nil", it is zero.

Business Rules:

- Total cash and cash equivalents must exist within this component.
- Total marketable securities must exist within this component.
- Total cash and cash equivalents must foot.
- Total marketable securities must foot.
- Total cash, cash equivalents, and marketable securities must foot.

HINT: Dimension defaults are misnamed.

"Dimension defaults" are commonly misunderstood to be a "default" value for a dimension or [Axis]. This is not the case. Dimension defaults are used to indicate the dimension or [Axis] value which serves as the intersection between two components which use the same one fact to express information which is presented in multiple physical locations within the set of components which make up a financial report. For example, "Cash and cash equivalents" is expressed both on the balance sheet and in the component breakdown of "Cash and cash equivalents". The balance sheet does not have a "Cash and cash equivalents type [Axis]", but the component breakdown of cash and cash equivalents does. This requires the fact to "morph" into two different forms in this case, potentially into even more forms. This happens by not physically instantiating the dimension default, or the intersection between the two components, within the context of the fact which must show up in two or perhaps more different presentation locations on the financial report. Rather, an XBRL processor virtually instantiates the dimension or [Axis] depending on the component "lens" through which you are looking at the fact.

This sounds a little like quantum physics, but if you think about it or better yet if you look at the fact tables of each of the components what is going on becomes quite clear.

***TECHNICAL**: Technically (if you are interested) what is going on behind the scenes is that XBRL processors create Cartesian products of all facts to deal with two situations. The first situation is these intersections between component fact tables. The second reason is the fact that XBRL 2.1 has no knowledge of XBRL Dimensions and this is the way XBRL International got XBRL 2.1 and XBRL Dimensions to work together correctly. This becomes another problem when you bring XBRL Formula into the equation. XBRL Formula has two aspect models: non-dimensional and dimensional. XBRL Formula cannot handle mixed models. It is very dangerous to mix XBRL instances with both dimensional and non-dimensional facts. It is best, and safest, to use one model or the other.*

23.21. Inventories details

Inventory components is a roll up of the detailed [Line Items] which make up the components of inventory. This component intersects with the balance sheet fact "Inventories" which it details. This roll up foots.

Component: (Network and Table)	
Network	5040 - Disclosure - Inventory Components (http://www.abc.com/role/InventoryComponents)
Table	Inventory Components [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Inventory Components [Line Items]	Period	
	2012-12-31	2011-12-31
Inventory, Net [Roll Up]		
Finished Goods	1,000,000	1,000,000
Work in progress	1,000,000	1,000,000
Raw materials	1,000,000	1,000,000
Other	1,000,000	1,000,000
Total inventories, net	4,000,000	4,000,000

Key Points:

- Component is a roll up.
- Alternatively, this could have been modeled as one concept and each individual component of inventory being articulated as a [Member] of an [Axis].

Business Rules:

- Total inventories is required.
- Total inventories must foot.

23.22. Property, plant and equipment details

Property, plant, and equipment details is two models. The first is a member aggregation which details property, plant and equipment, gross. The second is a roll up which details the components of property, plant, and equipment, net which are property, plant and equipment, gross and accumulated depreciation. Both the member aggregation and the roll up must foot. Property, plant, and equipment, net, intersects with and ties to the balance sheet.

Component: (Network and Table)	
Network	5050 - Disclosure - Property, Plant and Equipment Components (http://www.abc.com/role/PropertyPlantAndEquipmentComponents)
Table	Property, Plant and Equipment Components [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Property, Plant and Equipment [Line Items]	Period							
	2012-12-31				2011-12-31			
	Property, Plant and Equipment, Type [Axis]				Property, Plant and Equipment, Type [Axis]			
	Land [Member]	Machinery and equipment [Member]	Furniture and fixtures [Member]	Property, Plant and Equipment, All Types [Domain]	Land [Member]	Machinery and equipment [Member]	Furniture and fixtures [Member]	Property, Plant and Equipment, All Types [Domain]
Property, Plant and Equipment [Hierarchy]								
Property, plant and equipment, gross	40,000,000	50,000,000	7,000,000	97,000,000	40,000,000	50,000,000	7,000,000	97,000,000
Property, Plant and Equipment, Net, by Type [Roll Up]								
Property, plant and equipment, gross	40,000,000	50,000,000	7,000,000	97,000,000	40,000,000	50,000,000	7,000,000	97,000,000
Accumulated depreciation				(15,000,000)				(15,000,000)
Property, plant, and equipment, net				82,000,000				82,000,000

Key Points:

- The component which details property, plant, and equipment gross is modeled as a member aggregation.
- Alternatively, this could have been modeled as a roll up.
- The component which computes property, plant and equipment, net is a roll up (net = gross - accumulated depreciation).
- Note that this component intersects with the property, plant, and equipment policies via the connection created by the Property, Plant and Equipment Type [Axis].

Business Rules:

- Property, plant, and equipment, gross must exist.
- Accumulated deprecation must exist.
- Accumulated depreciation must be a positive value.
- Property, plant, and equipment, net must exist.
- Member aggregation of property, plant, and equipment, gross must foot.
- Roll up of property, plant and equipment, net must foot.

HINT: Modelling as [Line Items] or [Member]s of an [Axis]; which to use when?

If you look at the inventory components breakdown and the property, plant, and equipment breakdown; you will notice that they are modelled differently. Inventory components are modelled using multiple concepts within a set of [Line Items]. Whereas, property, plant and equipment, gross components are modelled using a single concept "Property, plant, and equipment, gross" and then distinguishing which the class of PPE using different [Member]s of the "Property, plant and equipment type [Axis]".

An obvious question is why the difference and when do you use the first approach and when do you use the second? Also, because the US GAAP Taxonomy uses both approaches, does not explain or reveal any pattern as to which approach is use and in fact many times provides both approaches for the same financial report component; selecting the right option can be challenging.

Here is the way to look at this. First off, most of the time how things are modelled in other areas determines how you have to model something. For example, the balance sheet is a set of concepts. You are not going to create an extension concept which is a [Member] of an [Axis] and get that on the balance sheet and get your balance sheet roll ups to foot correctly by using that approach. In this particular case, you need to create a concept which fits onto the balance sheet correctly given its existing model and given that all your business rules must work correctly.

The second consideration is the need to articulate other information. For example, if you consider the balance sheet parenthetical components of preferred and common stock, multiple pieces of information are provided for each class of stock. You cannot provide that information by creating one single concept, you have to create multiple concepts and wire those concepts together using a [Member] of an [Axis]. Further, if you consider the property, plant and equipment component breakdown and the property, plant, and equipment policies; the components and the policies are tied together via that "Property, plant and equipment type [Axis]" and the [Member]s of each component. It would be trivial for a user of the information to use those two components together, if of course the application using that information worked correctly and leveraged that connection.

And so, while there is no clear answer for all cases, these rules can be helpful in determining when to model a component as a set of [Line Items] or as [Member]s of an [Axis]:

Consider the component into which the piece that you are going to model must fit into, you need to make sure you don't break any existing component model and be sure you pass all business rules.

Consider how the component you want to create will intersect with other components.

Consider what other facts what you are modelling might be used with and now those components are modelled.

Consider whether your component communicates one piece of information per fact or will need to communicate multiple or a more complex set of facts.

Each approach does have a distinct set of pros and cons; understanding these pros and cons can help you make the correct choice given your specific situation.

HINT: Seeing how an [Axis] ties [Line Items] together

Take a look at two components and you can understand why modelling information correctly is important: Property, plant, and equipment policies and property, plant and equipment components:

Policies:

Component: (Network and Table)	
Network	4030 - Disclosure - Property, Plant and Equipment Policies (http://www.abc.com/role/PropertyPlantAndEquipmentPolicies)
Table	Property, Plant and Equipment Components [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Period	2012-01-01 - 2012-12-31
Legal Entity [Axis]	Consolidated Entity [Domain]

Property, Plant and Equipment [Line Items]	Property, Plant and Equipment, Type [Axis]		
	Land [Member]	Machinery and equipment [Member]	Furniture and fixtures [Member]
Property, Plant and Equipment Policies [Hierarchy]			
Basis of valuation	Mauris tincidunt cursus	Mauris tincidunt cursus	Mauris tincidunt cursus
Depreciation methods		Sed elementum feugiat	Mauris tincidunt
Estimated useful lives		15 years	5 years
Dispositions policy	Nam non tortor	Nam non tortor	Nam non tortor

Components:

Component: (Network and Table)	
Network	5050 - Disclosure - Property, Plant and Equipment Components (http://www.abc.com/role/PropertyPlantAndEquipmentComponents)
Table	Property, Plant and Equipment Components [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Property, Plant and Equipment [Line Items]	Period							
	2012-12-31				2011-12-31			
	Property, Plant and Equipment, Type [Axis]				Property, Plant and Equipment, Type [Axis]			
	Land [Member]	Machinery and equipment [Member]	Furniture and fixtures [Member]	Property, Plant and Equipment, All Types [Domain]	Land [Member]	Machinery and equipment [Member]	Furniture and fixtures [Member]	Property, Plant and Equipment, All Types [Domain]
Property, Plant and Equipment [Hierarchy]								
Property, plant and equipment, gross	40,000,000	50,000,000	7,000,000	97,000,000	40,000,000	50,000,000	7,000,000	97,000,000
Property, Plant and Equipment, Net, by Type [Roll Up]								
Property, plant and equipment, gross	40,000,000	50,000,000	7,000,000	97,000,000	40,000,000	50,000,000	7,000,000	97,000,000
Accumulated depreciation				(15,000,000)				(15,000,000)
Property, plant, and equipment, net				82,000,000				82,000,000

If you look at the model structures for these two components you see that they share the same axis, "Property, Plant and Equipment Type [Axis]" and the same [Member]s:

Policies model structure:

Component: (Network and Table)	
Network	4030 - Disclosure - Property, Plant and Equipment Policies (http://www.abc.com/role/PropertyPlantAndEquipmentPolicies)
Table	Property, Plant and Equipment Components [Table]

#	Label	Report Element Class	Period Type	Balance	Name
1	**Property, Plant and Equipment Components [Table]**	[Table]			us-gaap:ScheduleOfPropertyPlantAndEquipmentTable
2	**Legal Entity [Axis]**	[Axis]			dei:LegalEntityAxis
3	Consolidated Entity [Domain]	[Domain]			dei:EntityDomain
4	**Property, Plant and Equipment, Type [Axis]**	[Axis]			us-gaap:PropertyPlantAndEquipmentByTypeAxis
5	Property, Plant and Equipment, All Types [Domain]	[Domain]			us-gaap:PropertyPlantAndEquipmentTypeDomain
6	Land [Member]	[Member]			us-gaap:LandMember
7	Machinery and equipment [Member]	[Member]			us-gaap:MachineryAndEquipmentMember
8	Furniture and fixtures [Member]	[Member]			us-gaap:FurnitureAndFixturesMember
9	**Property, Plant and Equipment [Line Items]**	[Line Items]			us-gaap:PropertyPlantAndEquipmentLineItems
10	*Property, Plant and Equipment Policies [Hierarchy]*	[Abstract]			abc:PropertyPlantEquipmentPoliciesHierarchy
11	Basis of valuation	[Concept] String	For Period		us-gaap:PropertyPlantAndEquipmentBasisOfValuation
12	Depreciation methods	[Concept] String	For Period		us-gaap:PropertyPlantAndEquipmentDepreciationMethods
13	Estimated useful lives	[Concept] String	For Period		us-gaap:PropertyPlantAndEquipmentEstimatedUsefulLives
14	Dispositions policy	[Concept] String	For Period		us-gaap:PropertyPlantAndEquipmentDispositions

Components model structure:

Component: (Network and Table)	
Network	5050 - Disclosure - Property, Plant and Equipment Components (http://www.abc.com/role/PropertyPlantAndEquipmentComponents)
Table	Property, Plant and Equipment Components [Table]

#	Label	Report Element Class	Period Type	Balance	Name
1	**Property, Plant and Equipment Components [Table]**	[Table]			us-gaap:ScheduleOfPropertyPlantAndEquipmentTable
2	**Legal Entity [Axis]**	[Axis]			dei:LegalEntityAxis
3	Consolidated Entity [Domain]	[Domain]			dei:EntityDomain
4	**Property, Plant and Equipment, Type [Axis]**	[Axis]			us-gaap:PropertyPlantAndEquipmentByTypeAxis
5	Property, Plant and Equipment, All Types [Domain]	[Domain]			us-gaap:PropertyPlantAndEquipmentTypeDomain
6	Land [Member]	[Member]			us-gaap:LandMember
7	Machinery and equipment [Member]	[Member]			us-gaap:MachineryAndEquipmentMember
8	Furniture and fixtures [Member]	[Member]			us-gaap:FurnitureAndFixturesMember
9	**Property, Plant and Equipment [Line Items]**	[Line Items]			us-gaap:PropertyPlantAndEquipmentLineItems
10	*Property, Plant and Equipment [Hierarchy]*	[Abstract]			abc:PropertyPlantEquipmentHierarchy
11	Property, plant and equipment, gross	[Concept] Monetary	As Of	Debit	us-gaap:PropertyPlantAndEquipmentGross
12	*Property, Plant and Equipment, Net, by Type [Roll Up]*	[Abstract]			us-gaap:PropertyPlantAndEquipmentNetByTypeAbstract
13	Property, plant and equipment, gross	[Concept] Monetary	As Of	Debit	us-gaap:PropertyPlantAndEquipmentGross
14	Accumulated depreciation	[Concept] Monetary	As Of	Credit	us-gaap:AccumulatedDepreciationDepletionAndAmortizationPropertyPlantAndEquipment
15	Property, plant, and equipment, net	[Concept] Monetary	As Of	Debit	us-gaap:PropertyPlantAndEquipmentNet

Software applications, if they are built correctly, can leverage these sorts of intersections of metadata to provide functionality to users such as displaying the information about the components and the policies of components together. Software can also use these intersections to navigate to different sections of the same financial report which are linked together by this correctly modelled intersecting metadata.

It is this type of functionality which should drive the best way to model your financial information.

HINT: Roll ups, roll forwards, adjustments, variance are defined by which [Axis] changes.

If you look at a roll up, roll forward, adjustment, or variance visually they might look the similar. However, the dynamics of each is different and is defined by which [Axis] is changing. The following table summarizes which [Axis] changes for each of the different types of numeric relations patterns:

Metapattern	Concept	Period	Report date	Reporting scenario
Roll up	Yes	No	No	No
Roll forward	No	Yes	No	No
Adjustment	No	No	Yes	No
Variance	No	No	No	Yes

Note that for each of the numeric patterns articulated above, one and only one of the [Axis] changes. For example, a "roll up" it is an aggregation across some set of concepts, the only characteristic of a set of reported facts which changes in a roll up. For example, the assets roll up of a balance sheet is an aggregation of the items, or concepts, which make up the assets section of a balance sheet.

A member aggregation is similar to a roll up (such as the Inventories Components) except that rather than the concept changing (it does not change, it stays the same) it is the [Axis] which differentiates the [Member]s of that [Axis] which change (such as the Property, Plant and Equipment Components).

23.23. Deferred Costs details

Deferred costs details is a roll up which foots. The component intersects with the balance sheet.

Component: (Network and Table)	
Network	5060 - Disclosure - Deferred Costs (http://www.abc.com/role/DeferredCosts)
Table	Deferred Costs Components [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Deferred Costs Components [Line Items]	Period	
	2012-12-31	2011-12-31
Deferred Costs [Roll Up]		
Deferred advertising costs	2,000,000	2,000,000
Deferred set-up costs	2,000,000	2,000,000
Deferred sales commissions	5,000,000	5,000,000
Total deferred costs	9,000,000	9,000,000

Key Points:

- Component is a roll up.
- Alternatively, this could have been modeled as one concept and each individual component of deferred costs being articulated as a [Member] of an [Axis].

Business Rules:

- Total deferred costs must exist.
- Total deferred costs must foot.

QUESTION: Suppose a reporting entity had only one item of deferred costs, say "Deferred setup costs". There are two approaches which could be taken to disclose/present this item. The first would be to have the concept "Total deferred costs" on the balance sheet, then to have this same detail of the components of deferred costs as above, but showing only the single line item. The advantage of this is that analysts could always find deferred costs on the balance sheet and the always go find the component which details that total in the disclosures. Alternatively, a reporting entity could simply put the concept "Deferred setup costs" on the balance sheet. As there could be any number of different items of deferred costs on the balance sheet, the analysis algorithm would be vastly more complicated. Multiply this by each balance sheet line item, and writing analysis software becomes significantly more challenging and what the analysis software can safely do to sort out the items on the balance sheet is significantly reduced. The purpose of pointing this out is not to say that one approach is better than the other, it is simply to point out the reality of what analysis software needs to deal with and help the financial reporting

supply chain understand the options which they have available to them.

23.24. Product warranty accrual

The product warranty accrual is two components which work together to tie information together. The first component is a roll forward of the product warranty accrual. The second component is a roll up or breakdown of the total product warranty into its current and noncurrent portions which are provided on the balance sheet. The roll forward must reconcile and the roll up must foot.

Roll forward:

Component: (Network and Table)	
Network	5070 - Disclosure - Product Warranty Accrual (http://www.abc.com/role/ProductWarrantyAccrual)
Table	Product Liability Contingency [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Product Liability Contingency [Line Items]	Period	
	2012-01-01 - 2012-12-31	2011-01-01 - 2011-12-31
Product warranty accrual [Roll Forward]		
Product warranty accrual, beginning balance	58,000,000	58,000,000
Provision for product warranties issued	7,000,000	7,000,000
Payments to satisfy claims	(6,000,000)	(6,000,000)
Currency translation	(1,000,000)	(1,000,000)
Product warranty accrual, ending balance	58,000,000	58,000,000
Product Warranty Accrual, Balance Sheet Classification [Roll Up]		
Product warranty accrual, current portion	26,000,000	26,000,000
Product warranty accrual, noncurrent portion	32,000,000	32,000,000
Product warranty accrual, total	58,000,000	58,000,000

Key Points:

- Component is a roll forward.
- Note that this roll forward is for the total product warranty accrual, current and noncurrent portion.

Business Rules:

- Product warranty accrual concept is required.
- Product warranty accrual roll forward must reconcile.

Roll up:

Key Points:

- Component is a roll up.

Business Rules:

- Product warranty accrual is required.
- Product warranty accrual total must foot (roll up must foot).

QUESTION: If a reporting entity only has a current product warranty or only has a noncurrent product warranty; then which concept should be used for the roll forward? There are to choices: (a) the same concept they would use if they had both a current and noncurrent portion, or (b) either the current or noncurrent portion depending on which it is and then they would not need to roll up. In my view, while approach "b" seems appealing, approach "a" is superior as it makes financial reports consistent and analysis software does not have to deal with this exception. The primary point here is not specifically product warranty accruals, but rather the need to deal with each exception such as this within analysis software. This is an issue which is similar to having a domain which only has one member, such as pointed out in the preferred stock component of the balance sheet parenthetical section.

23.25. Long-term debt instruments

Long-term debt instruments is two components. The first component is a hierarchy which details facts reported for each debt instrument and it is also a member aggregation which details each long-term debt instrument amount and provides a total of all amounts of long-term debt instruments. The second component is a roll up which details the current and noncurrent portions of total long-term debt. Total long-term debt intersects with the long-term debt maturities component. The current and noncurrent portions intersect with the balance sheet. Detail of long-term debt instruments foots to total long-term debt. Current and noncurrent portions also foot to total long-term debt.

Component: (Network and Table)	
Network	5080 - Disclosure - Long-term Debt Instruments (http://www.abc.com/role/LongTermDebtInstruments)
Table	Long-term Debt Instruments [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

	Period			
	2012-01-01 - 2012-12-31			2011-12-31
	Long-term Debt, Type [Axis]			Long-term Debt, Type [Axis]
	Loans payable [Member]		Long-term Debt, All Types [Domain]	Long-term Debt, All Types [Domain]
	Debt Instrument [Axis]		Debt Instrument [Axis]	Debt Instrument [Axis]
Debt Instrument [Line Items]	Debt instrument AA [Member]	Debt instrument BB [Member]	Debt Instrument, All Instruments [Domain]	Debt Instrument, All Instruments [Domain]
Debt Instrument Hierarchy [Hierarchy]				
Description	Mauris tincidunt cursus est	Mincidunt est		
Collateral	cursus elt sem	cursus elit sem		
Interest rate	.10	.125		
Maturity date	April 2018	October 2016		
Amount	30,000,000	11,000,000	41,000,000	
Long-term Debt [Roll Up]				
Current portion of long-term debt			22,000,000	22,000,000
Long-term debt excluding current maturities			19,000,000	19,000,000
Long-term debt	30,000,000	11,000,000	41,000,000	

Key Points:

- Long-term debt instruments itself is a hierarchy which contains 5 concepts.
- The amount concept is part of a member aggregation.
- Note that in this hierarchy, the amount is shown twice, once for the current period and once for the prior period. Yet, the description, collateral, interest rate, and maturity date are shown once.
- Alternatively, this component could have been modeled as two concepts: one which contains the entire description (combining what is now separated into description, collateral, interest rate, maturity date). There are pros and cons related to either

combining the facts or separating the facts. Neither approach is inherently right or wrong; rather the needs of the overall system determine what is most appropriate.

- The breakdown of the current and noncurrent portion of long-term debt is a roll up. Although the roll up is presented upside down as compared to other roll ups, it is still a roll up.
- Another approach to expressing this roll up would be: "noncurrent portion of long-term debt = total long-term debt - current portion of long-term debt". However, by convention roll ups are generally shown: "Total = Part A + Part B". The reason for this has to do with limitations of XBRL Calculations and a rule created which shows the relations between debits and credits. The rule was created because people were modeling this type of situation inconsistently. In hind sight, the calculation rules for debits and credits is a mistake, in my view. The rules was created to protect people from themselves.
- The current portion intersects with both the balance sheet and should intersect with the maturities of long-term debt component. (See the question related to this in that component.)
- The long-term debt excluding current portion intersects with the balance sheet.

Business Rules:

- Long-term debt amount for each instrument foots to the total.
- Long-term debt amount is required.
- Total long-term debt = Current portion of long term debt + Long-term debt excluding current portion.

23.26. Long-term debt maturities

Long-term debt maturities is a roll up. The roll up foots to total long-term debt. Total long-term debt intersects with the long-term debt instruments component.

Component: (Network and Table)	
Network	5090 - Disclosure - Maturities of Long-term Debt (http://www.abc.com/role/MaturitiesOfLongTermDebt)
Table	Maturities of Long-Term Debt [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Maturities of Long-Term Debt [Line Items]	Period	
	2012-12-31	2011-12-31
Maturities of Long-Term Debt RollUp [Roll Up]		
Current	22,000,000	
2014	1,000,000	
2015	1,000,000	
2016	1,000,000	
2017	1,000,000	
Thereafter	15,000,000	
Total long-term debt	41,000,000	41,000,000

Key Points:

- Component is a roll up.
- Component intersects with the long-term debt instruments component.

Business Rules:

- The concept total long-term debt must exist in this component.
- Total maturities must foot.

QUESTION: The concept used to express current maturities here and the concept used to express current maturities on the balance sheet are two different concepts. Would it ever be the case that these two numbers would be different? If not (which I believe is the case) then one of the concepts should be removed from the US GAAP Taxonomy.

23.27. Other noncurrent liabilities details

Other noncurrent liabilities details is a roll up which foots to total other noncurrent liabilities. This component intersects with the balance sheet.

Component: (Network and Table)	
Network	5110 - Disclosure - Other Noncurrent Liabilities (http://www.abc.com/role/OtherNoncurrentLiabilities)
Table	Other Noncurrent Liabilities [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Other Noncurrent Liabilities [Line Items]	Period	
	2012-12-31	2011-12-31
Other Liabilities, Noncurrent [Roll Up]		
Other sundry noncurrent liabilities	250,000	250,000
Noncurrent deferred taxes and other liabilities	750,000	750,000
Total other noncurrent liabilities	1,000,000	1,000,000

Key Points:

- Component is a roll up, and is modeled using concepts which are part of a set of [Line Items].
- Alternatively, this could have been modeled as one concept and each individual component of other noncurrent liabilities being articulated as a [Member] of an [Axis].

Business Rules:

- Total other noncurrent liabilities must exist.
- Total other noncurrent liabilities must foot.

23.28. Business segment breakdown

The business segment breakdown is a hierarchy of facts which the reporting entity discloses for each business segment. In this case, each fact within the hierarchy is also part of a member aggregation which totals to a sum for all business segments. A number of the facts intersect with the income statement, capital additions intersects with the cash flow statement, and total assets intersects with the balance sheet. Note that this member aggregation is a complete flat set.

Component: (Network and Table)	
Network	5120 - Disclosure - Business Segments (http://www.abc.com/role/BusinessSegments)
Table	Business Segment Information, by Segment [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Segment Reporting Information [Line Items]	Period										
	2012-01-01 - 2012-12-31					2011-01-01 - 2011-12-31					2010-01-01 - 2010-12-31
	Business Segments [Axis]					Business Segments [Axis]					Business Segments [Axis]
	Business Segment Alpha [Member]	Business Segment Bravo [Member]	Business Segment Charlie [Member]	Business Segment Delta [Member]	All Business Segments [Domain]	Business Segment Alpha [Member]	Business Segment Bravo [Member]	Business Segment Charlie [Member]	Business Segment Delta [Member]	All Business Segments [Domain]	All Business Segments [Domain]
Business Segment Information [Hierarchy]											
Revenues	4,000,000	2,000,000	2,000,000	2,000,000	10,000,000	4,000,000	2,000,000	2,000,000	2,000,000	10,000,000	10,000,000
Operating expenses	500,000	500,000	500,000	350,000	1,850,000	500,000	500,000	500,000	350,000	1,850,000	1,850,000
Selling, general and administrative expenses	250,000	250,000	250,000	250,000	1,000,000	250,000	250,000	250,000	250,000	1,000,000	1,000,000
Depreciation	100,000	100,000	100,000	200,000	500,000	100,000	100,000	100,000	200,000	500,000	500,000
Operating income (loss)	1,000,000	1,000,000	1,000,000	1,150,000	4,150,000	1,000,000	1,000,000	1,000,000	1,150,000	4,150,000	4,150,000
Capital additions	4,000,000	2,000,000	2,000,000	2,000,000	10,000,000	4,000,000	2,000,000	2,000,000	2,000,000	10,000,000	10,000,000
Assets	25,000,000	25,000,000	47,000,000	50,000,000	147,000,000	25,000,000	25,000,000	47,000,000	50,000,000	147,000,000	

Key Points:

- This component is a hierarchy. In addition, each concept in the hierarchy is part of a member aggregation.
- This component intersects with the income statement, statement of cash flows, and the balance sheet.
- Note that the member aggregation is "flat". Contrast that to the geographic area component which is a two level hierarchy.

Business Rules:

- Each of the member aggregations must foot.
- Reporting entities can disclose different facts in many cases, other facts are specifically required.

NOTE: There is an issue with the creation application which needs to be worked around, the total Capital Additions should be a positive number but is shown as a negative number here. That will be corrected.

QUESTION: Should a business segment breakdown like this have a "Legal Entity [Axis]"?

23.29. Geographic areas breakdown

The geographic area breakdown is two hierarchies. The first hierarchy contains only the fact with the concept revenues. The second hierarchy has the fact with the concept long-lived assets (which is total noncurrent assets). Each component is also a member aggregation of each of those two concepts over the set of geographic areas. This member aggregation is a complete hierarchical set in that the set of countries has an additional layer of hierarchy in that countries are grouped into regions. Revenues intersects with the income statement. Long-lived assets intersects with the balance sheet.

Component: (Network and Table)	
Network	5130 - Disclosure - Geographic Areas (http://www.abc.com/role/GeographicAreas)
Table	Revenues from External Customers and Long-lived Assets by Geographic Area [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

	Period						
	2012-01-01 - 2012-12-31			2011-01-01 - 2011-12-31			2010-01-01 - 2010-12-31
	Geographic Area [Axis]			Geographic Area [Axis]			Geographic Area [Axis]
Revenues from External Customers and Long-Lived Assets [Line Items]	North America [Member]	Europe [Member]	All geographic areas [Domain]	North America [Member]	Europe [Member]	All geographic areas [Domain]	All geographic areas [Domain]
Revenues from External Customers [Hierarchy]							
Revenues	6,000,000	4,000,000	10,000,000	6,000,000	4,000,000	10,000,000	10,000,000
Long Lived Assets [Hierarchy]							
Long lived assets	52,000,000	39,000,000	91,000,000	52,000,000	39,000,000	91,000,000	

Key Points:

- This component could be modeled as one hierarchy or it could be modeled as to distinct hierarchies. Modeling it as two hierarchies as opposed to the one provides a better rendering of the information.
- This component intersects with the balance sheet and with the income statement.
- While most domains of an [Axis] tends to be flat, this set of members is a hierarchy because the individual countries are grouped into the regions "North America" and "Europe". Many people tend to imply meaning in such hierarchy, however there is nothing in XBRL which allows you to communicate such meaning, other than the expression of an XBRL Formula to explicitly state your meaning.
- This model could have been created using two separate [Axis], one for region and a different [Axis] for the country. Neither approach is inherently right or wrong, but XBRL US suggests that using one [Axis] in this situation is the better alternative.

Business Rules:

- Revenues foots by region.
- Revenues by region foots to total revenues.
- Long-lived assets foots by region.
- Long-lived assets foots to total long-lived assets.

- Revenues exists.
- Long-lived assets exists.

QUESTION: What is the general rule for when one should use one [Axis] and when one would use two separate [Axis]?

QUESTION: Should a geographic area breakdown like this have a "Legal Entity [Axis]" in addition to the Geographic Area [Axis]?

HINT: How to model nested hierarchies of members

[To Do]

23.30. Nonmonetary transactions details

Nonmonetary transactions is a hierarchy of facts. Of the facts, two facts are also member aggregations across the set of all monetary transactions. This component does not intersect with any other components, it stands on its own.

Component: (Network and Table)	
Network	5140 - Disclosure - Nonmonetary Transactions (http://www.abc.com/role/NonmonetaryTransactions)
Table	Nonmonetary Transaction, by Type [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Period	2012-01-01 - 2012-12-31
Legal Entity [Axis]	Consolidated Entity [Domain]

Nonmonetary Transaction [Line Items]	Nonmonetary Transaction Type [Axis]			
	Receipt of Assets in Satisfaction of Debt [Member]	Advertising Barter Transactions [Member]	Inventory Exchanges [Member]	Nonmonetary Transaction, All Types [Domain]
Nonmonetary Transaction [Hierarchy]				
Basis of accounting for assets transferred	Nunc in elit non metus viverra sollicitudin.	Mulla sit amet nibh	Nam non tortor non leo	
Name of counterparty	Duis metus	Nulla sit amet	Proinsitamet sem	
Gain (loss) recognized on transfer	100,000	100,000	100,000	300,000
Amount of barter transaction	200,000	200,000	200,000	600,000

Key Points:

- The component is a hierarchy of facts and also a member aggregation.
- Note that not all concepts are part of an aggregation.
- The component does not intersect with any other component, it stands alone.

Business Rules:

- Transaction type is required and is expressed using an [Axis].
- Basis of accounting for assets transferred, name of counterparty, gain on transfer, and amount of barter transaction are required in this component.

23.31. Selected financial information

The selected financial information component is a hierarchy in that it contains three facts which are not related to the other facts in any way except that all three concepts participate within the same component. However, the component is also a variance which, in this case, is the difference between an actual and forecast amounts of the facts. Each of the three facts intersects with the income statement.

Component: (Network and Table)	
Network	5150 - Disclosure - Select Financial Information (http://www.abc.com/role/SelectFinancialInformation)
Table	Select Financial Information [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Select Financial Information [Line Items]	Period				
	2012-01-01 - 2012-12-31			2011-01-01 - 2011-12-31	2010-01-01 - 2010-12-31
	Reporting scenario [Axis]			Reporting scenario [Axis]	Reporting scenario [Axis]
	Variance [Member]	Forecast [Member]	Actual [Domain]	Actual [Domain]	Actual [Domain]
Select Financial Information [Hierarchy]					
Revenues	(1,000,000)	11,000,000	10,000,000	10,000,000	10,000,000
Operating income (loss)	(850,000)	5,000,000	4,150,000	4,150,000	4,150,000
Net income (loss)	3,350,000	2,000,000	5,350,000	7,450,000	1,350,000

Key Points:

- Component is a hierarchy and a variance.
- A variance is a change of the Reporting Scenario [Axis] between two different reporting scenarios.
- It is the actual reporting scenario which generally intersects with other components. For example, here all three actual facts intersect with the income statement. As such, it is the actual [Member] which should be the dimension-default because that enables the facts to be usable within both components.

Business Rules:

- The variance between each scenario must compute. Here, variance = forecast - actual. This may vary depending on preference and depending on which reporting scenarios are used by the variance.

23.32. Subsequent events

Subsequent events is a hierarchy of four concepts which make up a subsequent event. Each concept is reported three times, once for each of the three subsequent events. In this case the amount is not aggregated (i.e. it is not a member aggregation) as it would make no sense to aggregate the amount of all three subsequent events. This component does not intersect with any other component within the financial report.

Component: (Network and Table)	
Network	5160 - Disclosure - Subsequent Events (http://www.abc.com/role/SubsequentEvents)
Table	Subsequent Event [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity	0000000001 (http://www.sec.gov/CIK)
Period	2012-01-01 - 2012-12-31
Legal Entity [Axis]	Consolidated Entity [Domain]

Subsequent Event [Line Items]	Subsequent Event Type [Axis]		
	Dividend Declared [Member]	Issuance of Debt [Member]	Threatened Litigation [Member]
Subsequent Event [Hierarchy]			
Event description	Nunc in elit non metus viverra sollicitudin. Duis metus. Donec pulvinar nonummy erat. In vel justo at urna rutrum ultrices. Cras consectetuer orci non lorem. Vestibulum bibendum aliquet augue.	Duis fermentum. Nullam dui orci, scelerisque porttitor, volutpat a, porttitor a, enim. Sed lobortis. Maecenas scelerisque ullamcorper libero. Aliquam porta leo imperdiet pede.	Suspendisse vestibulum augue eu justo. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas. Fusce suscipit pede ut erat. Sed rutrum.
Event date	2013-03-01	2013-02-15	2013-01-22
Event amount	100,000	200,000	50,000

Key Points:

- Component is a hierarchy.
- Although there is a numeric concept as part of this component, that amount is not aggregated.
- The US GAAP Taxonomy provides a specific set of concepts which should be reported for a subsequent event;

Business Rules:

- The type of subsequent event is required which is expressed via an [Axis] of the component.
- Either an amount is required, a range of amounts is required, or a reason an amount is inestimable is required.

QUESTION: A physical [Domain] (as this has been used in the past) is not necessary here. Why should it be provided and is it required to be provided. If so, why?

QUESTION: See the HINT "Differing forms of quantitative and qualitative measures. It seems that the taxonomy is very clear in indicating what concepts should be reported. However, if you look at the subsequent event disclosures of filers, very few use any of the [Line Items] provided by the US GAAP Taxonomy. Which is correct? How does the user of the US GAAP Taxonomy know the difference?

HINT: Commonly Used Axes

Some axes are specific to specific components modelled within a financial report taxonomy model. Other axes are very common and tend to be shared between components. The following is a summary of the more common axes used within a financial report:

- **Reporting entity**: Articulates the reporting entity, identified by the SEC CIK number to which a fact relates. Providing a reporting entity is required.
- **Period**: Articulates the calendar period to which a fact relates. (Note that XBRL has no means currently of articulating which fiscal period to which a fact relates, only the calendar period.) Providing a period is required.
- **[Line Items]**: Articulates the concept to which the reported fact relates such as "Cash and cash equivalents" or "Net income (loss). Providing a concept is required.
- **Legal Entity [Axis]**: Articulates the legal entity which is to which the fact relates such as the consolidated entity, parent holding company, variable interest entity, or some legal subunit. Generally facts are considered to relate to the consolidated entity if the Legal Entity [Axis] is not provided.
- **Report Date [Axis]**: Articulates the date of the report to which the reported fact relates. This could be the date filed or the audit report date. Generally facts are all considered to be of the same report date if the Report Date [Axis] is not provided.
- **Reporting Scenario [Axis]**: Articulates the reporting scenario of the reported fact such as actual, forecast, budgeted, etc. Generally facts are considered to be actual if the Reporting Scenario is not provided.
- **Business Segment [Axis]**: Articulates the business segment to which the reported fact relates. Generally facts are considered to relate to the combined business segment if the Business Segment [Axis] is not provided.
- **Geographic Area [Axis]**: Articulates the geographic area to which a reported fact relates. Generally facts are considered to relate to the combined set of all geographic areas if the Geographic Area [Axis] is not provided.

Note that syntactically, or considering the technical syntax, the reporting entity, period, and concept are implemented technically in a manner different than other axes. However, semantically or considering the business meaning, all are axes just like any other axes and articulate some specific characteristic related to a reported fact.

HINT: Using fact tables to understand component intersections.

The notion of intersections were discussed, this is another discussion of intersections leveraging the raw information which makes up a component of a financial report. This raw information is sometimes called a **fact table**.

Fact tables are exactly as the name implies, a table of facts. Recall that a fact is a set of characteristics, a value, and may contain some additional information if the fact is numeric which we will ignore for now.

The following is a fact table for the balance sheet component. A partial list of the 66 facts which make up the balance sheet are shown below. Each fact has the characteristics: Reporting entity, Period, Legal Entity, and Concept. Each fact also has a value. Each row which is numbered represents one fact.

Component: (Network and Table)	
Network	2001 - Statement - Balance Sheet (http://www.abc.com/role/BalanceSheet)
Table	Balance Sheet [Table]

#	Reporting Entity	Period	Legal Entity [Axis]	Concept	Value
1	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Liabilities and Equity	147000000
2	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Liabilities and Equity	147000000
3	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Product warranty accrual, current portion	26000000
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
62	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Assets	147000000
63	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Long-term debt	19000000
64	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Long-term debt	19000000
65	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Property, plant and equipment, net	82000000
66	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Property, plant and equipment, net	82000000

The fact table below is for the Property, Plant and Equipment Components component. Note that it likewise has characteristics. In fact, all the characteristic are the same except for one, the "Property, Plant and Equipment, Type [Axis]".

Note that line # 65 and #66 from the fact table above relating to the balance sheet and #11 and #12 below relating to the property, plant and equipment components component are the same fact (i.e. they exist only once within an XBRL instance).

Recall the hint "HINT: Dimension defaults are misnamed". Be sure you have read that hint.

Component: (Network and Table)	
Network	5050 - Disclosure - Property, Plant and Equipment Components (http://www.abc.com/role/PropertyPlantAndEquipmentComponents)
Table	Property, Plant and Equipment Components [Table]

#	Reporting Entity	Period	Legal Entity [Axis]	Property, Plant and Equipment, Type [Axis]	Concept	Value
1	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Property, Plant and Equipment, All Types [Domain]	Accumulated Depreciation, Depletion and Amortization, Property, Plant, and Equipment	15000000
2	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Property, Plant and Equipment, All Types [Domain]	Accumulated Depreciation, Depletion and Amortization, Property, Plant, and Equipment	15000000
3	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Machinery and equipment [Member]	Property, plant and equipment, gross	50000000
4	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Property, Plant and Equipment, All Types [Domain]	Property, plant and equipment, gross	97000000
5	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Land [Member]	Property, plant and equipment, gross	40000000
6	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Furniture and fixtures [Member]	Property, plant and equipment, gross	7000000
7	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Property, Plant and Equipment, All Types [Domain]	Property, plant and equipment, gross	97000000
8	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Land [Member]	Property, plant and equipment, gross	40000000
9	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Furniture and fixtures [Member]	Property, plant and equipment, gross	7000000
10	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Machinery and equipment [Member]	Property, plant and equipment, gross	50000000
11	0000000001 (http://www.sec.gov/CIK)	2011-12-31	Consolidated Entity [Domain]	Property, Plant and Equipment, All Types [Domain]	Property, plant and equipment, net	82000000
12	0000000001 (http://www.sec.gov/CIK)	2012-12-31	Consolidated Entity [Domain]	Property, Plant and Equipment, All Types [Domain]	Property, plant and equipment, net	82000000

The fact morphs, using the dimension-default, to be the balance sheet line item or to become the total of the property, plant and equipment components component (the net amount) depending upon which fact table or rendering you are using to look at the fact.

This is why the fact property, plant, and equipment, net can be viewed as an intersection between two components.

24. Digital Financial Reporting Principles

Whether you are an external financial reporting manager of a public company responsible for the creation of an XBRL-based financial filing which will be submitted to the SEC, someone on the team reviewing that filing, a third-party filing agent hired by a public company to create an XBRL-based financial filing, an internal auditor reviewing the filing, a third-party auditor providing agreed upon procedures to review the preparation of that digital financial report; if you don't have a proper comprehensive framework for checking your work you could:

(a) perform steps which do not contribute to the true and fair representation of the financial information reported,

(b) neglect to perform required steps necessary to prove to yourself that the information is a true and fair representation,

(c) be unaware of exactly what you are communicating within your digital financial report.

An appropriate, complete, rigorous framework and process is what accounting professionals need to property access the quality of the information reported within and XBRL-based digital financial report.

This document summarizes a set of common sense insights which have been distilled down to a handful of simple and easy to understand principles which apply to all XBRL-based digital financial reports. The principles apply to every digital financial report; every component which makes up that financial report, reported facts and characteristics of reported facts, and relations between those reported facts provided within that digital financial report.

24.1. Overview

These principles establish a framework so that unnecessary work is not performed and that all required steps are performed.

24.1.1. Evidence from comprehensive analysis of virtually all public company XBRL-based financial filings to the SEC

Looking at individual XBRL-based financial filings is helpful. Looking across many, many XBRL-based financial filings with a focus on one specific aspect of that financial report is likewise beneficial. Carefully and consciously comparing and contrasting many XBRL-based financial filings helps one build a mosaic, increasing ones understanding even more. Consciously comparing and contrasting XBRL-based financial reports helps one see and understand important and insightful information about those XBRL-based financial reports.

Contributing to assessing the information in this document is a thorough, comprehensive analysis[204][205] of 6,674 XBRL-based financial filings, all detail-tagged 10-K filings submitted to the SEC between March 1, 2013 and February 28, 2014.

[204] *Arriving at Digital Financial Reporting All Stars: Summary Information*, http://www.xbrlsite.com/2014/Library/AnalysisSummary_ArrivingAtDigitalFinancialReportingAllStars.pdf

[205] *Understanding the Minimum Processing Tests*, http://www.xbrlsite.com/2014/Library/UnderstandingMinimumProcessSteps-2014-02-14.pdf

24.1.2. Considering both the forest and the trees that make up the forest

When working with digital financial reports, it has been my observation that accounting professionals working with such reports forget about the "forest" into which the "trees" fit. In fact, many accounting professionals are most focused on the "leaves on the branches of the trees". This information focuses on trying to help accounting professionals understand the forest by looking at the individual trees which make up the forest. Further, this is not an analysis of how to represent specific accounting disclosures within an XBRL-based digital financial report. Rather, these principles are qualities which every financial and nonfinancial disclosure contained within a digital financial report possess.

While it is useful to examine individual public company XBRL-based financial filings, the vast majority of useful information comes from the comparing and contrasting how different public companies approached reporting their disclosures. It is the comparing and contrasting many public company XBRL-based financial reports that provides the best information. Comparing and contrasting reveals the forest into which the trees and the leaves on the branches of those trees fit.

If you understand the role that patterns play in the creation of software then you will also have an even greater appreciation for these principles. While this information is very helpful to professional accountants, it is likewise helpful to software vendors who endeavour to build software helpful to professional accountants who need to create quality digital financial reports such as XBRL-based digital financial reports which are filed with the SEC.

24.1.3. Understanding key terminology of a digital financial report

The following terminology sets a foundation for discussing these principles. These terms explain the framework within which all work to create or review a digital financial report[206] is performed. This terminology was first introduced by the *Financial Report Semantics and Dynamics Theory*[207] which derived these terms. This terminology is intended to have very precise definitions in order to enable precise communication. The following is a brief summary of these important terms:

- **Financial report**: Report which communicates financial and nonfinancial information about an economic or accounting entity to users of that report. Financial reports contain facts, characteristics which describe those facts, parenthetical explanations of facts, relations between facts.
- **Report component**: A report component is a set of facts which go together (tend to be cohesive and share a certain common nature) for some specific purpose within a financial report. For example, a "balance sheet" is a report component. The "Maturities of long-term debt" disclosure is a report component.
- **Fact**: A fact is reported. A fact defines a single, observable, reportable piece of information contained within a financial report, or fact value, contextualized for unambiguous interpretation or analysis by one or more distinguishing characteristics. A fact value is one property of a fact, every fact has exactly

[206] *Digital financial reporting harnesses computers for speed, accuracy*, http://searchfinancialapplications.techtarget.com/opinion/Digital-financial-reporting-harnesses-computers-for-speed-accuracy

[207] See *Financial Report Semantics and Dynamics Theory*: http://xbrl.squarespace.com/fin-report-sem-dyn-theory/

one fact value. The set of characteristics of a fact is a property of the fact. For example, *Cash and cash equivalents* of 100,000 for the *consolidated entity* for the current balance sheet date of *December 31, 2014* which is *reported in US Dollars* is a fact.

- **Characteristic**: A characteristic describes a fact. A characteristic or distinguishing aspect provides information necessary to describe a fact or distinguish one fact from another fact. A fact may have one or many distinguishing characteristics. For example, *line item concept Cash and cash equivalents* is a characteristic and the *calendar period December 31, 2014* are characteristics which describe a fact.
- **Parenthetical explanation**: Facts may have parenthetical explanations which provide additional descriptive information about the fact.
- **Relation**: A relation[208] is some interaction between the pieces which make up a financial report. Report components can be related to other report components. Reported facts can be related to other reported facts. Characteristics can be related to other characteristics. Business rules are a type of relation which describes computation type and logic-based relations. Classes or sets of concepts are relations.
- **Property**: A property is a trait, quality, feature, attribute, or peculiarity which is used to define its possessor and is therefore dependent on the possessor. A property belongs to something. For example, the color of a ball belongs to and is therefore is dependent on (is a property of) the ball. Financial reports have a set of properties. Components have a set of properties. Facts have a set of properties. Characteristics have a set of properties. Parenthetical explanations have a set of properties. Relations have a set of properties.

HINT: This video walks you through this foundational terminology: http://www.youtube.com/watch?v=uC-hrpxJ_fA.

24.1.4. Avoid creating a guessing game

Prudence dictates that using financial information in XBRL-based financial filings of public companies should not be a guessing game. Safe, reliable, predictable, automated reuse of reported financial information seems preferable.

Imagine if you had 100 different software applications which used 100 different software algorithms to unravel an income statement of an XBRL-based digital financial report. Why would software need to "unravel an income statement"? Well, because the US GAAP XBRL Taxonomy and/or SEC Edgar Filer Manual (EFM) don't force the information into a state where the information doesn't need to be unravelled and because public companies which file with the SEC don't take it upon themselves to make their information straight-forward and easy for a machine to

[208] *A Taxonomy of Part-Whole Relations*: http://csjarchive.cogsci.rpi.edu/1987v11/i04/p0417p0444/MAIN.PDF

interpret. Reading the income statement is a mechanical process performed by a machine. The machine needs to be able to interpret the information as the creator of the information intended.

That is the key: easy for a machine to interpret.

Humans are smart; machines such as computers are dumb. Computers only seem smart because humans meticulously constructed stuff to make the computers appear smart. For example, the information necessary to find and interpret the income statement must be provided to the machine.

Humans can figure anything out. The question is, do you want to do what is necessary for a machine to figure out a financial statement so that you can leverage what the machine can provide you if the machine can figure out what you want it to figure out.

24.1.5. Understand the purpose of a digital financial report

Agreed upon standard interpretations are critical to making a system work safely, reliably, predictably, and in a manner which can be repeated over and over without error. Philosophical or theoretical debates, trying to satisfy all arbitrary options, trying to meet every unimportant negligible situation, confusing what is objective and what is subjective, confusing policies with requirements and with choices only make something which could be sophisticated but simple into something which is complex, confusing, and can never be made to work.

Some people might believe that there is one absolute reality and that reality is their reality and that everything about their reality is important and they can compromise on nothing. Some people insist that everything involves judgment and that nothing is in any way subjective. But this is to miss the point.

The point being: a shared view of reality which is clearly interpretable and understood to achieve the purpose of meaningfully exchanging information so that time is reduced, costs are reduced, and information quality improves provides a benefit. The goal is to reach agreement so that the benefits can be realized.

The goal is to arrive at some equilibrium, to balance the duality of *standard*/*arbitrary*, to recognize that there is no singular objective reality but in spite of that, if we create a common enough shared reality to achieve some specific and agreed upon working purpose machines can be made to do useful work.

To make reality of the financial reporting domain appear to be objective and stable in certain specific and agreed upon ways in order to fulfil some higher purpose. The purpose is to enable a machine to read and interpret certain basic information such that manual human work can be effectively eliminated and that higher-level interpretations are then possible.

24.1.6. Understand that order must be created, disorder is the de facto state

Would it be better for an accounting professional to articulate information explicitly so that it is easy for software to understand exactly what the accounting professional is saying; or, do you want to let software applications do their best to guess what you are trying to communicate? Machines such as computers do well with things that are explicit, unambiguous, and consistent. Machines such as computers do poorly with things that are implied, ambiguous, or inconsistent.

This is about a choice. How to achieve the appropriate result is known: be explicit, unambiguous, and consistent. The question is, do you consciously want to do what is necessary to make things work reliably, predictably, repeatedly, consistently, and effectively? Again, *Prudence dictates that using financial information in XBRL-based financial filings of public companies should not be a guessing game.* If using the information is a guessing game, the information will certainly not be reliable or predictable. The first step in understanding how to avoid the guessing game is becoming conscious of what makes it necessary for computers to guess.

Besides, there are advantages if reliable machine readability and therefore automated reuse worked correctly. For example, then machines can help you create the financial report. If you want those advantages, certain things need to be done to create order from the disorder. Order must be created. If you don't create order, disorder is the de facto result.

24.1.7. Distinguishing the mechanical aspects from aspects which require judgment

The information reported within a digital financial report or set of digital financial or nonfinancial information is an identifiable, definitive, discrete set of reported facts. Those facts have an identifiable, definitive, discrete set of characteristics which distinguishes one fact from another fact. Those facts and characteristics have an identifiable, definitive, discrete set of relations. Those facts and characteristics have an identifiable, definitive, discrete set of properties. These attributes are a nature of the information itself. These are the mechanics of a structured digital financial report. These mechanics are not disputable.

While determining *what* must be reported and *how* it is reported can at times be subjective in nature and require significant professional judgment; once that judgment has been exercised and once the information is provided the facts, characteristics, relations, and properties of that reported information is in no way subjective and open to judgment or interpretation. They are simply facts that are governed by rules of logic. Those facts are objective. Those facts can be interpreted by a user of the facts as the user sees fit. But the facts themselves are objective.

Being able to distinguish the *mechanical aspects* from the *aspects that require judgment* in a digital financial report is important. These digital financial reporting principles relate only to the mechanical aspects, what the digital financial report is saying. Information which is ambiguous, illogical, irrational, or nonsensical is simply not useful and clearly stands out.

All facts, characteristics, relations, and properties can be identified; they are physical objects which can be observed. The mechanics of the objects which comprise a financial report are not a mystery; rather, they tend to be well understood. However, thinking of the information in this manner is not something which business professionals have been trained to do. But, as these facts, characteristics, relations, and properties are related to the business domain, this training is relatively easy.

The specific technical rules of the underlying format of digital financial reports, the Extensible Business Reporting Language[209] (XBRL) are specified and are clear. These rules are not mysterious, vague, or incomprehensible. They are intended to be unambiguous and generally not disputed. XBRL goes to great lengths to be unambiguous, this is what allows for interoperability.

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[209] *Extensible Business Reporting Language (XBRL) 2.1*, http://www.xbrl.org/Specification/XBRL-RECOMMENDATION-2003-12-31+Corrected-Errata-2008-07-02.htm

Given the correct mapping between a technical syntax and these facts, characteristics, relations, and properties; the technical syntax can be separated from the business domain semantics. If properly implemented, software can work with the technical syntax and expose only the business domain semantics to the business user making use of that software. The business user works with the business domain semantics, not the technical syntax. Software manages the technical syntax.

Likewise in accounting there are universal truths which are not disputed. Financial reports have balance sheets. Balance sheets balance. Balance sheets report "assets" and "liabilities and equity". Assets = Liabilities and Equity[210]. Assets foot. Liabilities and equity foots. Net income (loss) foots. Cash flow statements report net cash flows. These are objective details which are not open to interpretation but rather follow the rules specified by generally accepted accounting principles, such as US GAAP.

Good software hides technical details of an XBRL-based digital financial report from business professionals. Good software understands and leverages agreed upon business rules of financial reporting. This is achieved by articulating the accounting rules in a form that is understandable by a machine such as a computer.

If software does not hide technical details, then business professionals are still responsible for employing the technology appropriately and process details related to using the technology. Professional accountants are still responsible for understanding the mechanics and process of representing financial information using the XBRL format. If software professional accountants use to create digital financial reports does not hide details, accountants can either (a) get better software or (b) learn the technical details. What they cannot do is simply ignore the mechanics and process.

All report components, facts, characteristics, relations, and properties can be identified; they are physical objects which can be observed. The mechanics of the objects which are used to represent a financial report (i.e. an XBRL-based financial report) are not a mystery; rather, they tend to be well described by the XBRL technical specifications.

24.1.8. Understand risks and risk mitigation verification tasks

The objective of a general purpose financial report is to communicate information about some economic entity or accounting entity. The financial information provided should be a "true and fair representation" of the economic entities financial position and financial condition.

The risk and mitigation is independent of whether the verification task is performed by someone creating a digital financial report, an internal auditor, or a party which is or is not independent. Further, this set of risks is 100% comprehensive because it considers 100% of the business information contained within the digital financial report (reported facts, characteristics of those facts, parenthetical explanations of facts, relations, and all related properties). Technical syntax need not be considered when verifying report information.

Below is a summary of the risks which could lead to a financial report being invalid and the risk mitigation assertion or verification task which would assure that the risk goes unrealized.

[210] *The accounting equation*, http://en.wikipedia.org/wiki/Accounting_equation

Risk	Risk Mitigation Assertion (Verification task)
Full inclusion: All relevant facts, characteristics which describe facts, parenthetical explanations of facts, and relations between facts/characteristics are not included in the financial report.	**Completeness**: All relevant facts, characteristics of facts, parenthetical explanations of facts, and relations between facts/characteristics have been included within the financial report.
False inclusion: No facts, characteristics which describe facts, parenthetical explanations of facts, or relations between facts/characteristics which should not be included have been included.	**Existence**: No facts, characteristics which describe facts, parenthetical explanations of facts, relations between facts/characteristics are included within financial report which should not be included.
Inaccuracy: Property of a fact, characteristic, parenthetical explanation, component, or relation is inaccurate.	**Accuracy**: The properties of all facts, characteristics, components, parenthetical explanations, relations between facts/characteristics which are included in the financial report are accurate, correct, and complete.
Infidelity: All facts, characteristics, parenthetical explanations, and relations considered as a whole do not possess the required fidelity when considered as a whole.	**Fidelity**: Considered as a whole; the facts, characteristics, parenthetical explanations, and relations between facts/characteristics properly reproduces the financial and nonfinancial facts, characteristics, and relations of the reporting entity and provide a true and fair representation of such financial information.
Integrity not intact: Integrity between facts and characteristics which comprise one report component is inconsistent with all other report components.	**Integrity**: Considered as a whole, the facts and characteristics which make up the components of a report are consistent throughout all components of the financial report. There are no internal inconsistencies.
Inconsistency: The facts, characteristics, parenthetical explanations, relations and their properties expressed are inconsistent with prior reporting periods or with peers of the reporting entity.	**Consistency**: The facts, characteristics, parenthetical explanations, relations between facts/characteristics, and their properties are consistent with prior periods and with the reporting entities peers, as is deemed appropriate. There are no inconsistencies with other prior period or peers.
Not presented fairly: The financial report is not presented fairly and are therefore not a true and fair representation of the reporting economic entity in accordance with the financial reporting framework applied.	**True and fair representation**: The financial report is a true and fair representation of the information of the reporting economic entity. (An auditor might say presented fairly, in all material respects, and provide a true and fair representation in accordance with the financial reporting framework applied.

The task of verification/validation of the risks above can be automated to the extent that (a) machine readable business rules *can be* created and (b) such rules *have*

been created. If a machine readable business rule cannot be create or could be created but has not; then the verification/validation process must be performed manually. Manual verification/validation is more expensive than and more costly than automated machine-based verification/validation.

As such, automated verification/validation processes are preferable to manual processes because automated processes are more reliable, take less time, and are less costly.

24.1.9. Digital representations versus reality

What is the purpose of a digital financial report such as a public company XBRL-based digital financial report which is submitted to the SEC?

- **To define one absolute reality**: To arrive at someone's absolute definition of "true and fair representation of financial information"?
- **To create a shared reality to achieve a specific purpose**: To arrive at a shared common enough view of "true and fair representation of financial information" such that most of our working purposes, so that reality does appear to be objective and stable. So that you can query information reliably, predictably, repeatedly, safely.

Many people seem to believe that the answer is one forced absolute reality is being thrust on them. That is why they tend to think that everything is involves judgment and that everything is subjective. But this is to miss the point. A shared view of reality which is clearly interpretable and understood created in order to achieve the purpose of meaningfully exchanging information so that time is reduced, costs are reduced, and information quality improves for a financial report.

The goal is to arrive at some equilibrium, to balance the duality, to recognize that there is no singular objective reality but in spite of that, we ***create a common enough shared reality to achieve some working purpose***. ***To make reality of the financial reporting domain appear to be objective and stable in certain specific and agreed upon ways in order to fulfill some higher purpose.***

From what I can see, the accounting profession has yet to agree on the purpose and they have not successfully communicated that purpose to IT professionals because (a) they have not agreed on the purpose and (b) they don't even understand that they need to agree on and communicate that purpose so accountants have not taken the time to agree on or define that purpose.

The book *Data and Reality: A Timeless Perspective on Perceiving and Managing Information in Our Imprecise World, 3rd Edition*[211], by William Kent, helps understand issues related to getting machines such as computers to work with information. This discusses the importance of understanding your purpose:

In addition, there is a question of purpose. Views can be reconciled with different degrees of success to serve different purposes. By reconciliation I mean a state in which the parties involved have negligible differences in that portion of their world views which is relevant to the purpose at hand. If an involved party holds multiple viewpoints, he may agree to use a particular one to serve the purpose at hand. Or he may be persuaded to modify his view, to serve that purpose.

[211] http://www.amazon.com/Data-Reality-Perspective-Perceiving-Information/dp/1935504215

If the purpose is to arrive at an absolute definition of truth and beauty, the chances of reconciliation are nil. But for the purposes of survival and the conduct of our daily lives (relatively narrow purposes), chances of reconciliation are necessarily high. I can buy food from the grocer, and ask a policeman to chase a burglar, without sharing these people's views of truth and beauty. It is an inevitable outcome of natural selection that those of us who have survived share, within a sufficiently localized community, a common view of certain basic staples of life. This is fundamental to any kind of social interaction.

If the purpose is to maintain the inventory records for a warehouse, the chances of reconciliation are again high. (How high? High enough to make the system workably acceptable to certain decision makers in management.) If the purpose is to consistently maintain the personnel, production, planning, sales, and customer data for a multi-national corporation, the chances of reconciliation are somewhat less: the purposes are broader, and there are more people's views involved.

So, at bottom, we come to this duality. In an absolute sense, there is no singular objective reality. But we can share a common enough view of it for most of our working purposes, so that reality does appear to be objective and stable.

But the chances of achieving such a shared view become poorer when we try to encompass broader purposes, and to involve more people. This is precisely why the question is becoming more relevant today: the thrust of technology is to foster interaction among greater numbers of people, and to integrate processes into monoliths serving wider and wider purposes. It is in this environment that discrepancies in fundamental assumptions will become increasingly exposed.

Digital financial reporting is a choice to safely, reliably, predictably, exchange financial information in both human readable and machine readable form with the purpose of saving the cost of creation, cost of rekeying information for analysis. This is achieved by automating here-to-for manual processes.

24.1.10. Choosing how digital financial reporting will work

Professional accountants and others involved with the financial reporting supply chain have a choice as to how digital financial reporting will work. The options available are either conscious or unconscious to those who make decisions as to which option to select. If the wrong options are selected, digital financial reporting will not work the way professional accountants and the financial reporting supply chain desire it to work. Too many of the wrong options and digital financial reporting will be complex and even impossible for business professionals. Picking the right options can create an elegant and simple to understand and use system. To build the elegant and simple system, professional accountants and other business professionals simply need to understand their options and communicate that desire to IT professionals responsible for building that system. It really is that easy.

24.1.11. Providing feedback

The information in this document is intended to be an accurate, high-quality resource. If you have any comments, suggestions, ideas, or other feedback; please send your feedback to CharlesHoffman@olywa.net. If you have a difference of opinion or better idea, please document your opinion or better idea and send that.

24.2. Summary of Common Sense Principles

The following is a summary of common sense principles which should be consciously applied when creating or reviewing an XBRL-based financial report or other digital financial report. If you are not conscious of these principles you are likely unconsciously violating these principles.

These principles apply to every report component which discloses information. Again, this is not a cook book for representing specific accounting disclosures using the XBRL format. Every accounting disclosure benefits from these principles.

These principles are not religious dogma created to push toward one option or another where subjectivity is appropriate. These principles are logical, rational, and sensible ideas based on the observation and analysis of thousands of digital financial reports, what seems to work, and what does not work, and more importantly specifically why something does or does not work.

Each principle is explained, an example provided, visual examples are provide where helpful, as well as descriptive information where that is helpful. Many times both inappropriate approaches and appropriate approaches are shown so that they might be compared and contrasted so that specific differences can be understood.

Many times details are hard to explain with a simple narrative or screen shot. Comprehensive examples of each example are being created such that all details can be examined with the proper perspective so that all moving pieces at play can be examined for oneself. The comprehensive examples help to understand specific items of focus and other related pieces which impact the item of specific focus. You can find these examples here:

http://www.xbrlsite.com/2013/DigitalFinancialReportingPrinciples/

As mentioned, this is not a cookbook of accounting disclosures expressed using the XBRL format. Likely one day such a cookbook might be created. However there is a set of resources which tries to embody the principles outlined in this document. These resources can be helpful in understanding these principles. You can find these resources here:

- **Reporting templates**: this is a set of 75 common pieces of which might be included within an XBRL-based financial filing which strives to follow these principles: http://www.xbrlsite.com/2013/ReportingTemplates/2013-05-15/TemplateIndex/index.html
- **SEC Reference implementation**: this is a prototype of an XBRL-based financial filing which follows these principles and contains each of the patterns identified and described in this document: http://www.xbrlsite.com/DigitalFinancialReporting/ReferenceImplementation/2013-05-15/
- **SEC Comparison example**: this is in essence three versions of the reference implementation which is used to test ideas related to comparisons across XBRL-based financial filings: http://www.xbrlsite.com/DigitalFinancialReporting/ReferenceImplementation/rdf_Compare.xml
- **Comparison of disclosures**: this is a set of comparisons of the SEC Level 3 [Text Block] level and SEC Level 4 detail disclosures:

http://xbrl.squarespace.com/journal/2014/6/24/mind-boggling-diversity-of-sec-xbrl-financial-filings.html

- **Fortune 100 comparison**: this is an analysis of and comparison of Fortune 100 public company XBRL-based digital financial reports submitted to the SEC; see http://www.xbrlsite.com/2014/Prototype/DisclosureAnalysis
- **Fundamental accounting concepts analysis:** This is an analysis of each fundamental accounting concept relations rule; see http://xbrl.squarespace.com/understanding-sec-xbrl-financi/

24.2.1. Recognize that the goal is the meaningful exchange of information readable by both humans and machines.

Financial reports tell a story. That story is the same whether the information of that financial report is expressed on paper, electronically using HTML or PDF, or digitally using the XBRL technical format or some other machine readable format. Changing the medium which is used to communicate the information does not change the story the financial report coveys.

Creators and users of information conveyed in a financial report may interpret reported facts in different ways; however they must agree on the facts which have been reported. The meaning of the fact must be unambiguous.

Contrast this information:

Long-term Debt - Schedule of Debt Instruments (Details) (USD $)	3 Months Ended	12 Months Ended				
	Jan. 28, 2012	Jan. 28, 2012	Jan. 29, 2011	Jan. 30, 2010	Feb. 02, 2008	Apr. 30, 200
Debt Instrument [Line Items]						
Assets acquired through capital leases		$ 2,883,000	$ 0	$ 0		
Long-term Debt, by Current and Noncurrent [Abstract]						
Total long-term debt principal	156,011,000	156,011,000	164,478,000			
Unamortized discount on 1.125% Senior Convertible Notes	(17,690,000)	(17,690,000)	(24,679,000)			
Long-term debt - carrying value	138,321,000	138,321,000	139,799,000			
Current portion	(4,682,000)	(4,682,000)	(11,449,000)			
Net long-term debt	133,639,000	133,639,000	128,350,000			
Debt Instrument, Convertible, Conversion Price (per share)	$ 15.379	$ 15.379				
Common stock price per share threshold to include the dilutive effect related to the warrants	$ 21.607	$ 21.607				
Purchase price of early repayment of 1.125% Senior Convertible Notes		0	38,260,000	50,633,000		
Gain on repurchases of 1.125% Senior Convertible Notes		0	1,907,000	13,979,000		
Dilutive Effect of Notes and Warrants First Dollar In Excess of Conversion Price (shares)	558,000	558,000				
Cumulative Dilutive Effect at Conversion Price After Issuance of Warrants and Options (shares)	2,633,000	2,633,000				
Cumulative Dilutive Effect of Notes and Warrants First Dollar in Excess of Conversion Price After Issuance of Warrants and Call Options (shares)	3,346,000	3,346,000				
Cumulative Dilutive Effect of Notes, Warrants and Call Options First Dollar in Excess of Conversion Price After Issuance of Warrants and Call Options (shares)	425,000	425,000				
Interest Expense, Debt [Abstract]						
Amortization of Debt Discount		6,989,000	7,332,000	9,885,000		
Cash payments for interest		4,904,000	5,879,000	6,655,000		
Stated interest rate	1.125%	1.125%				
Maturities of Long-term Debt [Abstract]						
Long-term Debt, Maturities, Repayments of Principal During Year Ended February 2, 2013	4,682,000	4,682,000				
Long-term Debt, Maturities, Repayments of Principal During Year Ended February 1, 2014	2,682,000	2,682,000				
Long-term Debt, Maturities, Repayments of Principal During Year Ended January 31, 2015	147,686,000	147,686,000				
Long-term Debt, Maturities, Repayments of Principal During Year Ended January 30, 2016	763,000	763,000				
Long-term Debt, Maturities, Repayments of Principal During Year Ended January	498,000	498,000				

To this information:

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0000000001 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Consolidated Entity [Domain]

Balance Sheet Parenthetical [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Balance Sheet Parenthetical [Hierarchy]		
Accounts receivable, allowance	7,000,000	6,000,000

Preferred Stock Information, by Class [Line Items]	Period [Axis]					
	2010-12-31			2009-12-31		
	Class of Stock [Axis]			Class of Stock [Axis]		
	Class A Preferred Stock [Member]	Class B Preferred Stock [Member]	Class of Stock [Domain]	Class A Preferred Stock [Member]	Class B Preferred Stock [Member]	Class of Stock [Domain]
Class of Preferred Stock [Hierarchy]						
Preferred stock, par value per share	1	1		1	1	
Preferred stock, shares authorized	20,000	20,000		20,000	20,000	
Preferred stock, shares issued	20,000	20,000		20,000	20,000	
Preferred stock, shares outstanding	20,000	20,000		20,000	20,000	
Preferred stock, value outstanding	10,000,000	10,000,000	20,000,000	10,000,000	10,000,000	20,000,000

Common Stock Information, by Class [Line Items]	Period [Axis]					
	2010-12-31			2009-12-31		
	Class of Stock [Axis]			Class of Stock [Axis]		
	Class A Common Stock [Member]	Class B Common Stock [Member]	Class of Stock [Domain]	Class A Common Stock [Member]	Class B Common Stock [Member]	Class of Stock [Domain]
Class of Common Stock [Hierarchy]						
Common stock, par value per share	1	1		1	1	
Common stock, shares authorized	60,000	50,000		60,000	50,000	
Common stock, shares issued	50,000	40,000		50,000	40,000	
Common stock, shares outstanding	50,000	40,000		50,000	40,000	
Common stock, value outstanding	10,000,000	10,000,000	20,000,000	10,000,000	10,000,000	20,000,000

Which of the examples is easier to read? There are two things which make the first example hard to read. First, the rendering engine used to generate the first example does not show all information. For example, you cannot tell the CIK number or legal entity of the economic entity in the first example. Second, the organization of the representation of the information contributes to making it hard to understand. There are two things that contribute to a meaningful understanding: (a) the rendering engine and (b) the approach used to represent of the information (which is used by the rendering engine).

24.2.2. Meaningful exchange requires prior existence of agreed upon technical syntax, business domain semantics[212], and business domain workflow/process rules.

A meaningful exchange of information can only occur to the extent that technical syntax rules, business domain semantic rules, and business domain workflow/process rules have been defined *in advance*. To the extent that these rules exist *in advance*, information exchanged will have the quality of meaning for the information to be useful.

Rules are in essence a form of agreement. The rules are a communications tool. When humans are involved in interpreting information they can overcome a certain amount of ambiguity in communicated information. However, machines are less adept at overcoming ambiguity. If a rule is not explicitly specified and is open to interpretation, then a software developer must make a choice and decide how exactly to interpret that situation and therefore how a computer will react. If different software developers are involved, they will commonly interpret things differently.

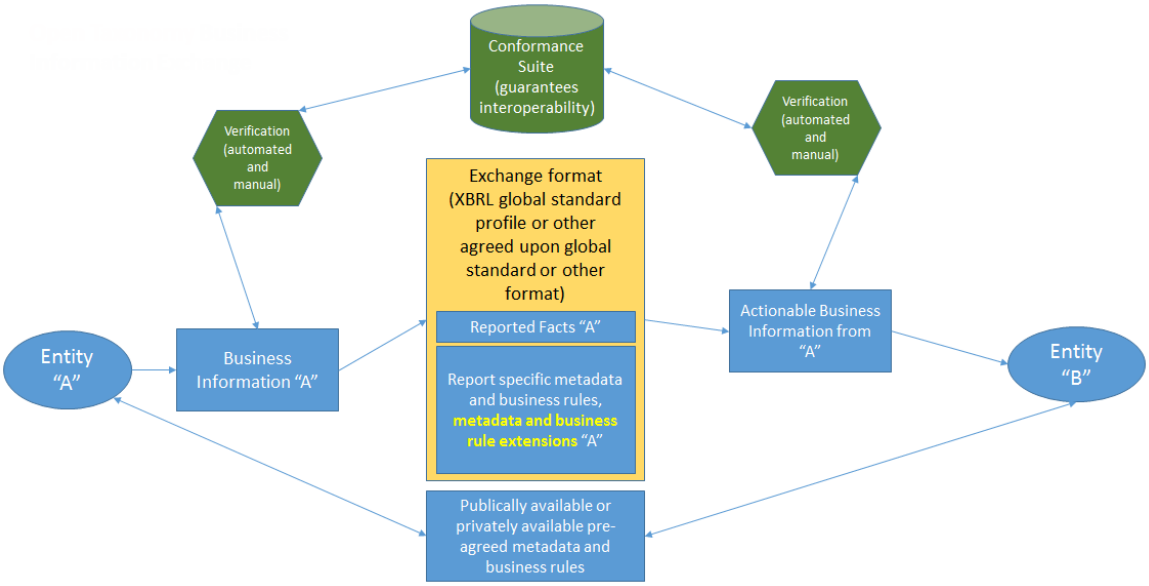
[212] Differentiating the terms syntax and semantics is crucial. If you don't understand the difference between the terms syntax and semantics, please see the video here: http://xbrl.squarespace.com/journal/2010/6/1/differentiating-syntax-and-semantics.html

Historically, such rules have generally been hard coded into individual business systems by programmers. Before the internet existed and therefore before one business system could communicate with another business system this was not really a problem. Every system was a silo.

All that changed when the internet came into existence. Now it is possible to exchange information between business systems.

However, rather than hardcoding rules into individual systems these rules can be created external to a system as metadata and managed by business professionals rather than the IT department. Why is this important? Because if business people can change rules by changing metadata (rather than relying on programmers to change software code); the way the system acts can be changed by business professionals. Costs are reduced, time is saved, functionally can be tweaked with less effort. The rules can also be exchanged *between* systems.

Standard business rules allow for the rules to be created once and then shared between systems. This is one means of making sure that both systems have the same understanding of the information being exchanged. Commercially available business rules engines can process structured financial and nonfinancial information against publically and/or privately specified business rules.



The set of possible rules is endless. XBRL technical syntax rules and technical syntax interoperability are excellent with XBRL[213]. This is because of the XBRL technical syntax specification and software conformance suite. The conformance suite in is why the interoperability is excellent. The meaning at the XBRL syntax level is very good and therefore software interoperability at the syntax level is very good.

At the business semantics level, we are not there yet but things are improving. There are more "formal" and "informal" approaches to expressing these business domain semantic rules. The more formal the approach the more complicated things can get and the harder it is to use the system; but the higher the information quality because of the formalness. The less formal or informal, the easier things are but the

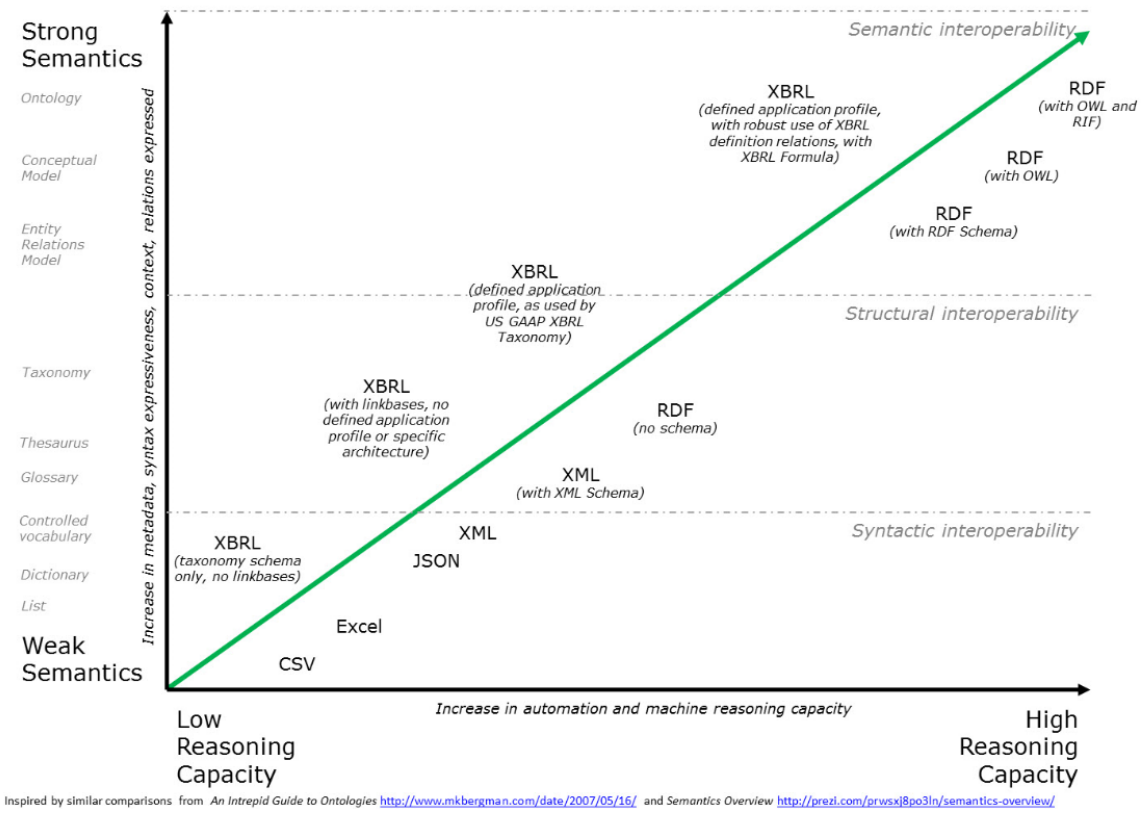
[213] http://xbrl.squarespace.com/journal/2014/3/17/xbrl-technical-syntax-update-insights-obtained.html

lower the quality of information. Striking the correct balance between formal and informal is important.

Different technical syntax formats have different amounts of expressive power. The more expressive power a representation format has, the stronger the business semantics which can be expressed. The stronger the semantics, the more reasoning capacity a machine can provide. The more reasoning capacity, the more work a machine can provide.

The graphic below shows the relation between the expressiveness of different knowledge representation schemes and the relative automation or reasoning capacity which can be achieved[214].

Comparison of Knowledge Representation Expressiveness and Relative Automation/Reasoning Capacity



Inspired by similar comparisons from *An Intrepid Guide to Ontologies* http://www.mkbergman.com/date/2007/05/16/ and *Semantics Overview* http://prezi.com/prwsxj8po3ln/semantics-overview/

Again, striking the right balance is key. That will make the system practical and cost-effective. It will also make the system consistent, reliable, repeatable, predictable, and otherwise effective.

Less is known about workflow/process rules. That will be the next issue we run up against. For example, when an SEC filer submits a filing, that filing can be amended. What happens to the original filing in the database when another filing amends a filing? There are those sorts of issues that are not even on people's radar yet.

The following is a comprehensive summary of the items of a digital financial report which must be verified[215]. The list is broken down by what can be verified using automated processes and what must be verified manually.

[214] http://www.xbrlsite.com/2014/Library/ExpressivenessAndReasonaingCapacityComparison.jpg

#	Goal or Desired State of Digital Financial Report	More Information	Comments, examples, etc.	Automatable	Manual	FY 2013 (automatable tests only)	FY 2012 (automatable tests only)
1	XBRL technical syntax consistent with XBRL technical specification requirements	See		X		99.9%	99.9%
2	Consistent with requirements of EDGAR Filer automated and manual (EFM) syntax/semantics rules	See		X	X	97.9%	80.5%
3	Consistent and unambiguous report level representation or model structure	See	Tests arrangement of Network, Table, Axis, Member, Line Items, Abstracts, Concepts	X		99.9%	97.9%
4	Root entity of focus (economic entity, accounting entity) successfully and unambiguously detectable	See	If the entity of focus is not detected, unable to perform other tests	X		99.2%	98.8%
5	Current balance sheet date (document period end date) and income statement period (period context of document period end date) successfully and unambiguously detected	See		X		99.3%	99.8%
6	Fundamental accounting concept skeleton successfully and unambiguously detected and relations between concepts intact/sound	See		X		97.8%	97.9%
7	Primary financial statement roll up computations (balance sheet, income statement, statement of comprehensive income, cash flow statement) detected, intact, and foot	See	This has a dependency on discovery of fundamental accounting concepts. For example, if the concept "net cash flow" is not found, won't be able to find a roll up for net cash flow either.	X		90.1%	84.9%
8	Primary financial statements successfully discovered		This should be automatable, but if certain conditions exist it cannot be automated.	X	X	Generally successful	Generally successful
9	Primary financial statements foot and roll forward (cash flow statement, statement of changes in equity) appropriately		This is a duplicate of #7 which does not include the roll forwards; this is beyond the primary financials footing	X		Unknown	Unknown
10	Level 1 footnote disclosures appropriate		There is no way to automate this 100% unless the filer uses concepts from the US GAAP XBRL taxonomy.	X	X	Unknown	Unknown
11	Industry specific accounting concepts and relations valid		Similar to the fundamental accounting concepts, but for specific industries or activities	X	X	Unknown	Unknown
12	Level 2 policy text block disclosures appropriate				X	Fair	Unknown
13	Each Level 3 [Text Block] and related Level 4 detail disclosure match appropriately	See		X	X	Poor	Poor
14	Each Level 4 detail disclosure valid including representation structure, mathematical computations, intersections with other components, etc.	See	See the separate disclosure testing algorithm	X	X	Unknown	Unknown
15	Required disclosures discovered		Nature of business, basis of reporting, accounting policies and all other required disclosures are discovered	X		Unknown	Unknown
16	Reported prior period information consistent with prior report current period information where appropriate			X	X	Unknown	Unknown
17	Disclosure rules have been met and make sense		For example, if PPE exists on the balance sheet then PPE details should be discovered to be disclosed and PPE estimated useful lives should be discovered to be disclosed	X	X	Unknown	Unknown
18	Report element selection is justifiable, defensible, and otherwise appropriate				X	Unknown	Unknown
19	Reported facts appropriate				X	Unknown	Unknown
20	Variance analysis of reported facts as compared to peer or peer group appropriately explainable		Generally automatable using management by exception approach	X	X	Unknown	Unknown
21	Report element selection is consistent with peers or peer groups as appropriate				X	Unknown	Unknown
22	Disclosure checklist review for full inclusion		There is no way to automate the process of detecting things which should have been disclosed based on transactions, events, or other circumstances that are not included within report		X	Unknown	Unknown
23	True and fair representation of financial information of economic entity				X	Unknown	Unknown

Current manually created disclosure checklists will be replaced, to a degree, by automated machine-based processes. Structured information makes this possible. You can think of it this way. In the past, information was unstructured and therefore unreadable by a computer process. Now information is structured. Some portion of the manual process of creating a financial report will be automated. The extent that a process can be automated is directly correlated with the ability to create machine readable rules and extent to which those rules exist.

24.2.3. Recognize that even if SEC filing rules and the US GAAP XBRL Taxonomy may allow for ambiguity; approaches do exist where SEC filings rules can be followed and information is consistent, explicit and unambiguous.

There is a "safe" or "happy path" through SEC EFM filing rules and the US GAAP XBTL Taxonomy where a quality, reliable, predictable, repeatable implementation approach can result. While it is likewise possible to pick a path where meaning is not clear and information is impossible or difficult to make use of; paths likewise exist which make meaning unambiguous and easy to make use of.

Consider the graphic below. The outer most box represents what is allowed by the XBRL technical specification. The US GAAP Taxonomy Architecture specifies addition constraints, limiting how the XBRL technical syntax can be used. For example, the US GAAP Taxonomy Architecture disallows the use of tuples, typed dimensions, and the precision attribute which XBRL does allow. The SEC places further restrictions on what is allowed. For example, every public company submitting an XBRL-based financial filing must use a specific entity identifier scheme and identifier, the CIK number. The EFM rules require this and inbound validation performed by the SEC enforces this rule.

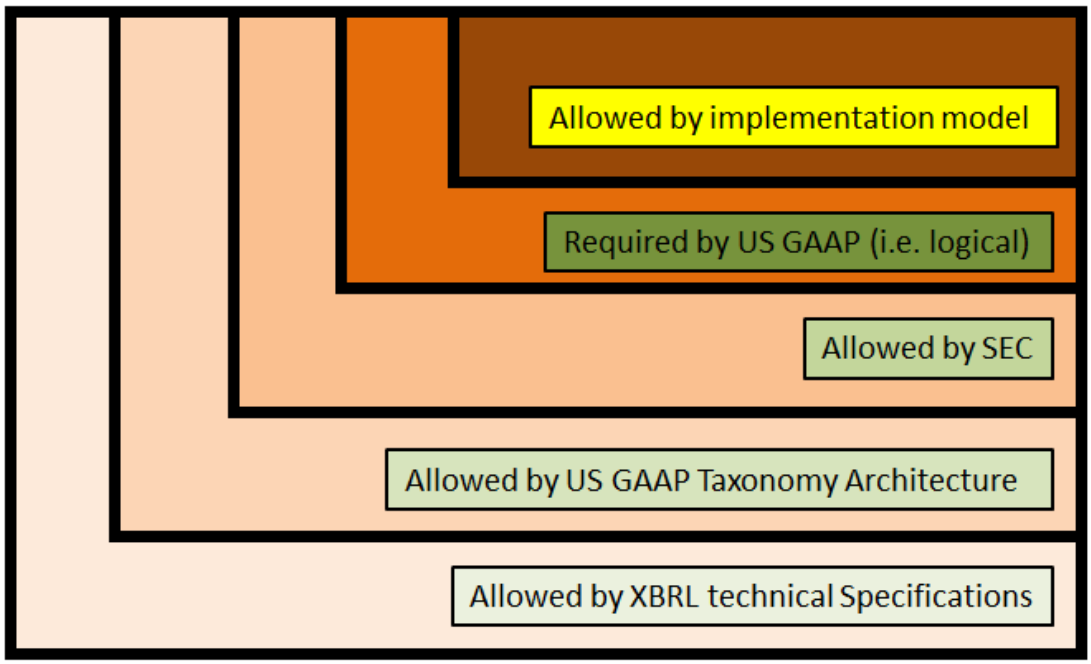
[215] Digital financial reporting disclosure checklist, http://www.xbrlsite.com/2014/Library/DisclosureChecklist.pdf

US GAAP itself further restricts how the XBRL technical syntax can be used. For example, balance sheets balance (assets = liabilities and equity). However, neither the SEC nor the FASB provides this rule in machine readable form. But this does not prohibit a system from creating and enforcing this very logical business rule.

The smallest box is a more constrained set of rules that follows all other rules specified by US GAAP, the SEC, the US GAAP Taxonomy Architecture, and the XBRL technical specification. For example, the SEC and US GAAP XBRL Taxonomy architecture does not *require* [Table]s to be used to report all information. But it does *allow* [Table]s to be used. There is nothing that prevents a software vendor from requiring the consistent use of [Table]s in their software. In fact, some software vendors do. Why? Because if software consistently uses [Table]s, you don't need to explain to an accounting professional when to use a [Table] and when not to use a [Table]. One less detail to worry about, the system takes care of that detail for you.

Basically, the box below labeled Allowed by implementation model is nothing more than an application profile, a common tool software developers use to hide complexity from business professionals making use of software.

It is through balancing all of these layers correctly that an easy to use approach to expressing financial information digitally can be achieved.



Creating software that is complex and difficult to use is easy. Building software that is simple to use is hard work.

24.2.4. Recognize that being explicit contributes to the unambiguous interpretation of reported information.

The probability that reported facts will be agreed to by creators and users of information is increased if reported facts are explicit and unambiguous. Likewise, if

information needs to be implied by the user of the financial information the probability for an inappropriate interpretation increases.

Explicit is defined as "stated clearly and in detail, leaving no room for confusion or doubt". Implicit is defined as "understood though not directly expressed". Explicit is preferred to implicit because many times something which one might believe is understood but not directly expressed, could be understood differently than one might expect it to be understood. Being explicit makes it unnecessary to imply.

Unambiguous is defined as "not open to more than one interpretation". The definition of meaningful is "something that has a purpose". Information cannot be both "meaningful" and "ambiguous". Ambiguous is defined as "open to more than one interpretation" or "doubtful or uncertain".

The purpose of a financial report is to convey meaning.

The only way a meaningful exchange of information can occur is the prior existence of agreed upon syntax, semantics, and workflow/process rules. To the extent that these explicit business rules exist, information can be unambiguous.

24.2.5. Strive for consistency

Consistency is good and preferred over inconsistency. Consistency makes things simpler. "Simple" is not about doing simple things. Simplicity is the ultimate sophistication.

If there is no specific reason for an inconsistency which can be explained which justifies the inconsistency; then you are very likely being inconsistent unconsciously with no reason and therefore one of the approaches can and should be dropped.

Inconsistencies cause additional training costs and additional burden, and unnecessary, burden on the user to somehow rationalize the inconsistency.

24.2.6. Recognize the difference between presentation and representation.

Paper and HTML are presentation formats. XBRL is a representation format. The representation format can be leveraged to also present information.

Accountants can choose to *present* information in different ways according to their preferences. However, the *representation* of information is not generally subject to interpretation. Consider the following income statement fragments:

Fragment #1:

Net income (loss)	1,000,000
Net income (loss) attributable to noncontrolling interest	200,000
Net income (loss) attributable to parent	800,000

Fragment #2:

Net income (loss)	1,000,000
Less: Net income (loss) attributable to noncontrolling interest	200,000
Net income (loss) attributable to parent	800,000

Fragment #3:

Net income (loss)	1,000,000
Net income (loss) attributable to noncontrolling interest	(200,000)
Net income (loss) attributable to parent	800,000

Fragment #4:

Net income (loss) attributable to parent	800,000
Net income (loss) attributable to noncontrolling interest	200,000
Net income (loss)	1,000,000

If someone was interpreting those four different fragments above, what is the difference in interpretation would you expect? Most likely none. Clearly, each of the fragments communicates the same facts, the same information. While the presentation of the information in each fragment is different, the meaning or representation of the facts articulated is identical.

Imagine having to write an explanation which a software developer would use to get a computer application to correctly interpret each of these four fragments. Imagine that someone came up with a fifth approach for articulating this information. The point here is that while the way this information can be presented is arbitrary, the information itself is standard. A standard is defined as "used or accepted as normal or average; something established by authority, custom, or general consent as a model or example." One standard makes machine interpretation trivial.

For example, while an accountant might label a line item "Less allowance for doubtful accounts:" and either show "1000" or "(1000)" for a value, information represented for computer use may not work this way and provide meaningful, unambiguous information. A good example of this is how dividends is provided within an XBRL-based financial report. There is no situation where dividends can have a negative value per the definition of the concept "us-gaap:Dividends". The documentation and balance attribute clearly indicate this.

> HINT: An all too common mistake is to report dividends as a negative number because the presentation is negative. Dividends, and numerous other concepts, may never be negative in order to allow for unambiguous

interpretation by software applications. A rendering engine can present information in many, many different ways as long as the information can first be interpreted correctly.

24.2.7. Recognize that a financial report must be a true and fair representation.

Clearly the financial information provided by an economic entity within a financial report must not be "untrue" or "unfair". As such, then a financial report must be "true" and "fair". These are not ideas defined by XBRL, the SEC, or even the US GAAP XBRL Taxonomy. These are ideas expressed in the conceptual framework of financial reporting for US GAAP. The conceptual framework of US GAAP uses the term "faithful representation". The conceptual framework states that a faithful representation is complete, neutral, and free from error. Historically, it has been the case that professional accountants needed to only represent financial information on paper correctly; but now professional accountants need to also create an appropriate *representation* of the information using the XBRL-based structured format.

HINT: Don't confuse the external reporting manager's responsibility to create a true and fair representation with the third-party auditor's responsibility to make sure the financial report is "presented fairly in all material respects".

24.2.8. Recognize that financial reports contain a discrete set of report elements which have specific properties and relations.

A financial report may be broken down into a discrete set of report components which are organized together for some purpose. For example, a balance sheet is a discrete report component which reports assets and liabilities and equity.

For example, here is information about the report elements of 7160 XBRL-based financial filings, all 10-K filings, filed with the SEC:

Reported facts: (for 6,644 XBRL-based financial filings)

Reports Count	Reported Facts	Extension Facts	Average Facts Per Report	Average Extension Rate
6,674	8,532,275	1,530,331	1,278	17.94%

Breakdown of report elements: (for 6,644 XBRL-based financial filings)

Reports	Networks	Tables	Axis	Members	Lineitems	Abstract	Concepts
6,674	477,041	232,233	386,915	1,210,860	232,693	737,943	3,165,250

Average report elements by report: (for 6,644 XBRL-based financial filings)

Networks	Tables	Axis	Members	LineItems	Abstract	Concepts
71	35	58	181	35	111	474

Breakdown by networks of disclosure/statement; detail/text block:

Category	SubCategory	Networks	Report elements	Tables	Axis	Members	LineItems	Abstracts	Concepts
Document	Detail	6,418	104,619	1,917	1,829	2,809	1,934	6,213	89,917
Document	TextBlock	15	116	1	1	1	1	10	102
Statement	Detail	42,529	1,097,965	22,727	25,084	77,772	22,784	153,331	796,267
Statement	TextBlock	49	473	5	5	18	5	98	342
Disclosure	Detail	276,750	4,330,342	183,241	334,526	1,088,678	183,547	425,423	2,114,939
Disclosure	TextBlock	149,161	397,655	23,101	23,745	27,568	23,181	149,222	150,838
Schedule	Detail	1,326	32,931	1,201	1,684	13,943	1,201	2,851	12,051
Schedule	TextBlock	793	1,781	40	41	71	40	795	794

The point here is that you are not managing one big thing when creating a digital financial report. What you are managing is lots of little things. Many times one thing relates to some other thing. That relationship must be both intact and correctly represented. Business rules express those relations. Automated processes can leverage those business rules. But for automated processes to work, they need to have the business rules expressed so that software can use those rules. No computer readable business rules = manual process must be used. Manual process = increase cost and increased probability for error. There are many, many little pieces. Managing all these pieces manually simply cannot work.

24.2.9. Recognize that digital financial report elements can be categorized into common groups which have common relevant properties.

All these little pieces have names. Those pieces can be categorized into useful groupings. The report elements of a digital financial report can be categorized or grouped into a discreet set of categories which have the same properties: Network, [Table], [Axis], [Member], [Line Items], Concept, and [Abstract][216].

This implies that using the term "tag" to discuss something which is contained within a digital financial report is not appropriate because a more precise term would exist. The term "tag" is a syntax term which has imprecise meaning.

- **Network**: A network is a one approach to break an XBRL-based financial filing into smaller pieces. There are two reasons why you might need to break a financial filing into pieces: because you want to or because you have to. Networks are not necessary for understanding information. However, the SEC Interactive Data Viewer and other rendering applications do use them, sometimes in different ways. Networks help to order or sequence reported information. In XBRL-based financial filings, networks have a ***number***, a ***sort category***, and a ***title***. For example, "100001 - Statement - Balance Sheet".

[216] These terms are used by the US GAAP Taxonomy Architecture, see http://xbrl.us/Documents/SECOFM-USGAAPT-Architecture-20080428.pdf

The number and the sort category help to articulate the flow of the financial filing.

- **Table**: A table is used to combine facts which go together for some specific reason. Tables are comprised of axis and line items. The line items of a table share the axis defined within a table. There are two types of tables: explicit tables and implicit tables. An explicit table always has at least one explicit axis; it could have more than one. An explicit table always has one set of line items.
- **Axis**: An axis is a means of providing information about the characteristics of a fact reported within a financial report.
- **Member**: A member is a possible value of an [Axis]. A [Member] is always part of a domain of an [Axis], thus the term "member" (i.e. of the domain or set; a domain is simply a set of [Member]s which relates to a specific [Axis]). Members of an [Axis] tend to be cohesive and share a certain common nature.
- **Line Items**: [Line items] are a set of concepts which can be reported by an entity, they can contain values. [Line Items] may also contain [Abstract] concepts which can never report values but rather are used to help organize the [Line Items].
- **Concept**: A concept refers to a financial reporting concept or a non-financial concept which can be reported as a fact within an XBRL-based financial filing. A concept is sometimes referred to as a concrete concept, as compared to an abstract concept (see next report element). [Line Items] contain Concepts organized within a component which have the same information model. Concepts can be concrete (meaning they can be reported) or abstract (meaning that they are never reported; they are only used to organize the concepts contained within a set of line items).
- **Abstract**: An Abstract is a class of Concept. Abstracts are used for organization and can never be reported. Abstracts can be used within a [Line Items] or it can be used to organize the Tables within a Network.

HINT: The [Line Items] is in essence a special type of [Axis] which articulates the concept characteristic of a reported fact.

HINT: While the reporting entity and period are not called [Axis], they act exactly like an [Axis] to characterize reported facts. The reporting entity and period are implied [Axis]. The reporting entity indicates the CIK number of the reporting entity. The period indicates the calendar period of a reported fact.

HINT: A [Domain] is not a type of report element. A [Domain] as used by the US GAAP XBRL Taxonomy and XBRL-based financial filings is a [Member] which is the root of a domain of members. A domain is simply a set of members.

24.2.10. Recognize that each category of report elements has allowed and disallowed relations.

We pointed out that an XBRL-based financial filing is made up of report elements. Those report elements can be categorized: Network, Table, Axis, Member, LineItems, Abstract, and Concept.

These relationships are referred to as the report level model structure or representation structure[217]. The top part of the graphic below shows the relations which are OK, which are disallowed, and which are not advised. The bottom part of the graphic shows information about the number of these relations within the set of 6,644 XBRL-based financial filings analyzed.

		LAX Model, SEC filers supported						
		Parent						
		Network	Table	Axis	Member	LineItems	Abstract	Concept
Child	Network	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL	Illegal XBRL
	Table	OK	Disallowed	Disallowed	Disallowed	Disallowed	OK	Disallowed
	Axis	Disallowed	OK	Disallowed	Disallowed	Disallowed	Disallowed	Disallowed
	Member	Disallowed	Disallowed	OK	OK	Disallowed	Disallowed	Disallowed
	LineItems	Disallowed	OK	Disallowed	Disallowed	Disallowed	Disallowed	Disallowed
	Abstract	OK	Disallowed	Disallowed	Disallowed	OK	OK	Not advised
	Concept	Not advised	Disallowed	Disallowed	Disallowed	OK	OK	Not advised

		LAX Model, SEC filers supported						
		Parent						
		Network	Table	Axis	Member	LineItems	Abstract	Concept
		477,041	232,230	386,912	1,216,391	232,690	732,409	3,165,249
Child	Network	0	0	0	0	0	0	0
	Table	1,261	1	0	0	45	230,899	24
	Axis	1	386,888	0	0	3	20	0
	Member	3	0	450,091	766,221	4	72	0
	LineItems	183	232,181	0	0	107	217	2
	Abstract	474,310	22	0	1	113,059	144,471	546
	Concept	46	26	11	137	1,222,427	1,929,257	13,346

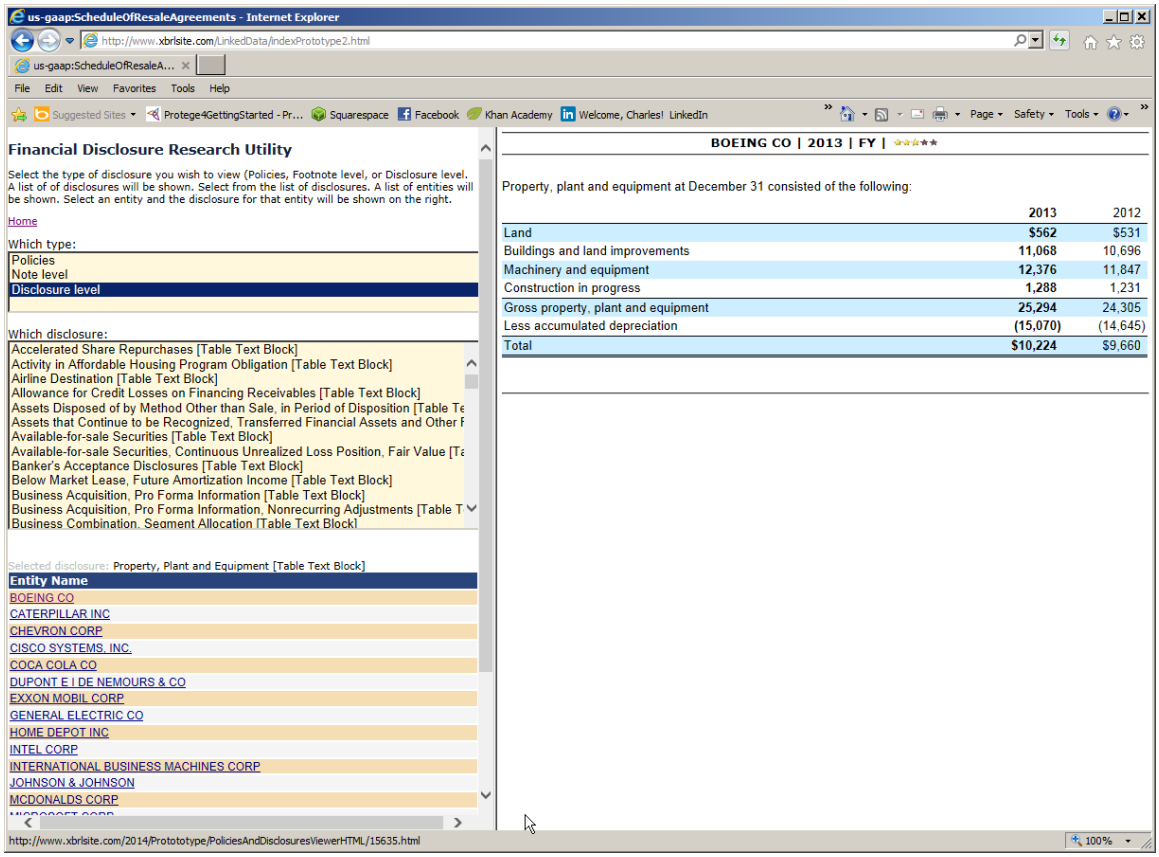
For example, Axis are related to Tables, not to concepts. Your XBRL-based financial filing should comply with these relations. What would it mean if you found an Axis within a set of LineItems?

24.3. Recognize that financial reports contain a discrete set of financial report component which can be categorized.

A financial report may be broken down into a discrete set of report components which are organized together for some purpose. These report components can be grouped in to similar components. For example, a balance sheet is a discrete report component. Every public company reports a balance sheet in their financial report.

[217] *Report level model structure*, http://xbrl.squarespace.com/journal/2014/3/16/report-level-model-structure-update-insights-obtained.html

To make this notion clear, consider the fact that the US GAAP XBRL Taxonomy provides a set of [Text Block]s. Each of those [Text Block]s have a name. The screen shot below is an application[218] which allows its user to look at the disclosure made for reporting entities for each of these different [Text Block]s.



24.3.1. Recognize and respect relations between SEC Level 3 [Text Block]s and SEC Level 4 Detail disclosures.

Recognize that relations exist between the SEC Level 3 [Text Block]s and SEC Level 4 detailed disclosures within an XBRL-based financial filing. The two disclose the same information, just at different levels of detail.

Consider this example which will explain what is meant. The example provided below comes from this XBRL-based financial filing by Microsoft:

http://www.sec.gov/Archives/edgar/data/789019/000119312513310206/0001193125-13-310206-index.htm

This is Microsoft's disclosure of the items which make up property, plant and equipment provided as an SEC Level 3 [Text block] *us-gaap:PropertyPlantAndEquipmentTextBlock*.

[218] You can use the application to view the report components at this URL: http://www.xbrlsite.com/LinkedData/indexPrototype2.html

Component: (Network and Table)	
Network	1040 - Disclosure - Property and Equipment (Tables) (http://www.microsoft.com/taxonomy/role/NotesToFinancialStatementsPropertyPlantAndEquipmentDisclosureTextBlockTables)
Table	Statement [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0000789019 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Entity [Domain]

Statement [Line Items]	Period [Axis] 2012-07-01 - 2013-06-30
Components of Property and Equipment	The components of property and equipment were as follows:

(In millions)

June 30,	2013	2012
Land	$ 525	$ 528
Buildings and improvements	7,326	6,768
Leasehold improvements	2,946	2,550
Computer equipment and software	9,242	7,298
Furniture and equipment	2,465	2,087
Total, at cost	22,504	19,231
Accumulated depreciation	(12,513)	(10,962)
Total, net	$ 9,991	$ 8,269

Here is the same information provided as an SEC Level 4 disclosure with the bottom line value (i.e. Total, net) of this disclosure being the concept *us-gaap:PropertyPlantAndEquipmentNet*.

Component: (Network and Table)	
Network	1071 - Disclosure - Components of Property and Equipment (Detail) (http://www.microsoft.com/taxonomy/role/DisclosureComponentsOfPropertyAndEquipment)
Table	Property, Plant and Equipment [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0000789019 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Entity [Domain]

Property, Plant and Equipment [Line Items]	Period [Axis] 2013-06-30	2012-06-30
Land	525,000,000	528,000,000
Buildings and improvements	7,326,000,000	6,768,000,000
Leasehold improvements	2,946,000,000	2,550,000,000
Computer equipment and software	9,242,000,000	7,298,000,000
Furniture and equipment	2,465,000,000	2,087,000,000
Total, at cost	22,504,000,000	19,231,000,000
Accumulated depreciation	(12,513,000,000)	(10,962,000,000)
Total, net	9,991,000,000	8,269,000,000

This relationship is not a coincidence and is not unique to the property, plant, and equipment details disclosure. The PDF below points to an analysis of the property, plant and equipment details disclosure for numerous XBRL-based financial filings:

http://www.xbrlsite.com/2014/Library/PropertyPlantAndEquipmentNetByTypeRollUp.pdf

As the analysis shows, the SEC Level 3 and SEC Level 4 disclosure are synchronized in the vast majority of property, plant, and equipment details disclosure.

This blog post shows similar analysis for a hand full of other disclosures:

http://xbrl.squarespace.com/journal/2014/6/24/mind-boggling-diversity-of-sec-xbrl-financial-filings.html

For example, here another disclosure: Property, plant and equipment estimated useful lives. Here is the SEC Level 3 text block disclosure, the filers concept for this SEC Level 3 text block was *ncs:ScheduleOfUsefulLivesPropertyPlantAndEquipmentTableTextBlock*, an extension.

Estimated useful lives for depreciation are:

Buildings and improvements	10 – 39 years
Machinery, equipment and furniture	3 – 15 years
Transportation equipment	4 – 10 years
Computer software and equipment	3 – 7 years

And here is the SEC Level 4 detailed disclosure of the same information, the concept used by the filer was *us-gaap:PropertyPlantAndEquipmentUsefulLife*.

Component: (Network and Table)	
Network	159 - Disclosure - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES (Details 4) (http://www.ncilp.com/role/SummaryOfSignificantAccountingPoliciesDetails4)
Table	Schedule Of Summary Of Significant Accounting Policies [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0000883902 (http://www.sec.gov/CIK)
Period [Axis]	2012-10-29 - 2013-11-03

	Property, Plant and Equipment, Type [Axis]							
	Building and Building Improvements [Member]		Machinery and Equipment [Member]		Transportation Equipment [Member]		Computer Software and Equipment [Member]	
	Range [Axis]		Range [Axis]		Range [Axis]		Range [Axis]	
Summary Of Significant Accounting Policies [Line Items]	Maximum [Member]	Minimum [Member]	Maximum [Member]	Minimum [Member]	Maximum [Member]	Minimum [Member]	Maximum [Member]	Minimum [Member]
Property, Plant and Equipment, Useful Life	P39Y	P10Y	P15Y	P3Y	P10Y	P4Y	P7Y	P3Y

http://www.sec.gov/Archives/edgar/data/883902/000114420413068730/0001144204-13-068730-index.htm

The point is that a similar relation exists for this disclosure and other disclosures. Further, while it is beyond the scope of this document; comparing and contrasting disclosures raises many, many questions which accountants expressing this information should be aware of.

For example with regard to the property, plant and equipment estimated useful lives disclosure: the fact that so many filers created an extension concept for the SEC Level 3 text block or used an obviously incorrect concept to express this disclosure, it is clear that this SEC Level 3 text block is missing from the US GAAP XBRL Taxonomy. Also, if you consider the property, plant and equipment estimated useful lives disclosure and then look at the finite-lived intangible assets estimated useful

lives disclosure; you realize that that SEC Level 3 text block is likewise missing from the taxonomy.

HINT: The US GAAP XBRL Taxonomy has many missing SEC Level 3 [Text Block]s. As such, it may seem hard to match the Level 3 [Text Block] and SEC Level 4 detail disclosures. What many filers do is try to find "some text block which is close". This causes two problems. First, it causes your text block to not match the disclosures of others who are using this text block properly. Basically, you will be inconsistent with other SEC filings. Second, it makes it harder to discover text blocks which are missing from the US GAAP XBRL Taxonomy. It is better to create an extension concept than use an inappropriate concept.

HINT: In XBRL-based financial filings, some filers provide the property, plant, and equipment details disclosure using the text block used by most others, the concept us-gaap:PropertyPlantAndEquipmentTextBlock. However, rather than the SEC Level 4 detail disclosure having the most commonly used concept us-gaap:PropertyPlantAndEquipmentNet, the filers use the concept us-gaap:PropertyPlantAndEquipmentGross. What does this mean? Is this intended by the US GAAP XBRL Taxonomy, or is this a mistake? Another similar situation is where some filers use the same SEC Level 3 [Text Block] to express information which is current with other SEC filers using that same SEC Level 3 [Text Block] to disclose information which is noncurrent in the Level 4 detailed representation. Is this intended or is it an oversight? It seems rather odd that the same SEC Level 3 [Text Block] would be used to express different SEC Level 4 detail disclosures.

Another thing to consider is that the US GAAP XBRL Taxonomy provides two different approaches to expressing detailed information in many cases. One way is to differentiate reported facts using concepts. Another way is to express information using one concept, but than an [Axis] and [Member] to differentiate reported facts. Here is an example of the concept based approach:

Component: (Network and Table)	
Network	1071 - Disclosure - Components of Property and Equipment (Detail) (http://www.microsoft.com/taxonomy/role/DisclosureComponentsOfPropertyAndEquipment)
Table	Property, Plant and Equipment [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0000789019 (http://www.sec.gov/CIK)
Legal Entity [Axis]	Entity [Domain]

Property, Plant and Equipment [Line Items]	Period [Axis]	
	2013-06-30	2012-06-30
Land	525,000,000	528,000,000
Buildings and improvements	7,326,000,000	6,768,000,000
Leasehold improvements	2,946,000,000	2,550,000,000
Computer equipment and software	9,242,000,000	7,298,000,000
Furniture and equipment	2,465,000,000	2,087,000,000
Total, at cost	22,504,000,000	19,231,000,000
Accumulated depreciation	(12,513,000,000)	(10,962,000,000)
Total, net	9,991,000,000	8,269,000,000

And here is an example of the single concept differentiated using an [Axis] and [Member]s:

Component: (Network and Table)	
Network	4090 - Disclosure - Property and Equipment (Details) (http://www.ascentmediacorporation.com/role/DisclosurePropertyAndEquipmentDetails)
Table	Schedule of Property, Plant and Equipment [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0001437106 (http://www.sec.gov/CIK)

Property and Equipment	Period [Axis]							
	2012-01-01 - 2012-12-31				2011-01-01 - 2011-12-31			
	Property, Plant and Equipment, Type [Axis]				Property, Plant and Equipment, Type [Axis]			
	Land [Member]	Building and Leasehold Improvements [Member]	Machinery and Equipment and Software [Member]	Property, Plant and Equipment, Type [Domain]	Land [Member]	Building and Leasehold Improvements [Member]	Machinery and Equipment and Software [Member]	Property, Plant and Equipment, Type [Domain]
Property and equipment, gross	23,170,000	35,206,000	28,685,000	87,061,000	34,896,000	54,575,000	22,763,000	112,234,000
Accumulated depreciation				(30,570,000)				(37,537,000)
Property and equipment, net				56,491,000				74,697,000

Both approaches articulate the same meaning or information. Each approach has its pros and cons. But these two approaches raise the question of whether the US GAAP XBRL Taxonomy should have one text block or two text blocks, one for each detailed approach.

HINT: The two approaches of representing property, plant, and equipment information (the first using [Line Items], the second using [Member]s of an [Axis]) are semantically equivalent even though they use different XBRL technical syntax approaches.

Another issue which is raised relates to the following example. Suppose a filer decides to provide the property, plant and equipment details on the balance sheet. Does this mean that the SEC Level 3 text block is or is not required?

Property and equipment		
Land	6,234,000,000	6,206,000,000
Buildings and improvements	30,356,000,000	28,653,000,000
Fixtures and equipment	5,583,000,000	5,362,000,000
Computer hardware and software	2,764,000,000	2,567,000,000
Construction-in-progress	843,000,000	1,176,000,000
Accumulated depreciation	(14,402,000,000)	(13,311,000,000)
Property and equipment, net	31,378,000,000	30,653,000,000
Other noncurrent assets	1,602,000,000	1,122,000,000
Total assets	44,553,000,000	48,163,000,000

Again, keep in mind that while the discussion focused on specific disclosures here, property, plant and equipment; these situations exist for virtually every disclosure and there are about a thousand different disclosures.

24.3.2. Recognize the existence of and properly respect and represent intersections between financial report components.

Financial report components which make up a financial report can be intersected with one or more other report components. For example, "Inventories" summarized in the balance sheet might be detailed within a disclosure contained within a note to the financial report. The "Total inventories" concept is the intersection between the summary and detail report components.

For example, below you see a summary (the balance sheet) and detail (the property, plant and equipment details breakdown).

Balance sheet:

Reporting Entity [Axis]	0000000001 (http://www.sec.gov/CIK)	
Legal Entity [Axis]	Consolidated Entity [Domain]	
	Period [Axis]	
Balance Sheet [Line Items]	2012-12-31	2011-12-31
Assets [Roll Up]		
Current assets [Roll Up]		
Cash, cash equivalents, and marketable securities [Roll Up]		
Cash and cash equivalents	11,000,000	10,000,000
Marketable securities	9,000,000	10,000,000
Cash, cash equivalents, and marketable securities	20,000,000	20,000,000
Accounts receivable, net of allowance for doubtful accounts of $1,000 and $1,000	29,000,000	29,000,000
Inventories	4,000,000	4,000,000
Prepaid expenses	3,000,000	3,000,000
Total current assets	56,000,000	56,000,000
Noncurrent assets [Roll Up]		
Property, plant and equipment, net	82,000,000	82,000,000
Deferred costs	9,000,000	9,000,000
Total noncurrent assets	91,000,000	91,000,000
Total assets	147,000,000	147,000,000
Liabilities and Equity [Roll Up]		
Current liabilities [Roll Up]		
Accounts payable	3,000,000	3,000,000
Accrued liabilities	4,000,000	4,000,000
Current portion of long-term debt	22,000,000	22,000,000
Product warranty accrual, current portion	26,000,000	26,000,000

Property, plant, and equipment breakdown:

Reporting Entity [Axis]		0000000001 (http://www.sec.gov/CIK)	
Legal Entity [Axis]		Consolidated Entity [Domain]	
		Period [Axis]	
Property, Plant and Equipment [Line Items]	Property, Plant and Equipment, Type [Axis]	2012-12-31	2011-12-31
Property, Plant and Equipment, Net, by Type [Roll Up]			
Property, plant and equipment, gross	Land [Member]	40,000,000	40,000,000
	Machinery and equipment [Member]	50,000,000	50,000,000
	Furniture and fixtures [Member]	7,000,000	7,000,000
	Property, Plant and Equipment, All Types [Domain]	97,000,000	97,000,000
Accumulated depreciation	Property, Plant and Equipment, All Types [Domain]	(15,000,000)	(15,000,000)
Property, plant, and equipment, net	Property, Plant and Equipment, All	82,000,000	82,000,000

It is challenging to show the notion of an intersection and how useful it is in software applications. This video walks you through what an intersection is and how to view them using the XBRL Cloud Viewer: http://www.youtube.com/watch?v=lNPjwKy2Obs

HINT: A good way to view intersections is using the free Firefox XBRL plug-in or the XBRL Cloud Viewer.

24.3.3. Recognize and respect fundamental accounting concepts and unchangeable relations between those accounting concepts

Financial reports contain a "skeleton" which forms a frame for a financial report. For example, financial reports always contain balance sheets; balance sheets always contain the concepts "Assets" and "Liabilities and Equity"; and a balance sheet always balances. There are some exceptions to this general rule; for example when a statement of net assets is used but this case is simply another reporting option which would be handled by a different rule specific to that reporting circumstance. Exceptions such as this does not mean that there are no rules, it just means that there are different rules. See the section relating to report frames.

In addition, this skeleton or fundamental accounting concepts[219] have relations with other fundamental accounting concepts which never change. For example, "Assets" = "Liabilities and Equity" is a relationship which never changes. Assets = Current Assets + Noncurrent Assets is a relationship which never changes.

The fact that a relation exists has nothing to do with whether a reporting entity reported a concept or not. For example, if a reporting entity reported "Assets" and "Current Assets", the relation "Assets = Current Assets + Noncurrent Assets" still holds. In fact, one can leverage that relationship to impute the value of "Noncurrent Assets" using basic mathematics: "Noncurrent Assets = Assets – Current Assets". So while the concept Noncurrent assets might not be reported, that does not mean that the value does not exist.

The verification of the existence of these fundamental accounting concepts and adherence to the specified relations can be automated and enforces using software.

Proof that these fundamental accounting concepts and relations between these concepts exist is XBRL-based financial filings themselves. When one examines public company XBRL-based financial filings provided to the SEC, one sees that 98% of all financial reports have these concepts and relations. This can be observed within the 6,644 XBRL-based financial filings analyzed, all 10-K filings[220], follow this rule.

[219] *Fundamental Accounting Concepts*, http://fundamentalaccountingconcepts.wikispaces.com/
[220] For details of the analysis see http://xbrl.squarespace.com/journal/2014/3/16/fundamental-accounting-concepts-update-insights-obtained.html

Further, when you look at the XBRL-based reports which do not conform to these rules, the reason for nonconformance can tracked to precisely identifiable reasons for each and every issue and each issue can be attributed to a specific party:

- Concepts missing from or ambiguity in US GAAP XBRL Taxonomy (i.e. FASB error)
- Ambiguity in SEC EFM rules (i.e. SEC error)
- Misinterpretation by filer caused by ambiguity in US GAAP XBRL Taxonomy or EFM rules (i.e. FASB/SEC error)
- Quality control issues on part of reporting entity creating XBRL-based digital financial report (i.e. filer error)
- Misinterpretation of US GAAP XBRL Taxonomy and/or SEC EFM rules by my software (i.e. FASB/SEC error)
- Errors in my mappings and impute rules used by software when reading and then using digital financial report information (i.e. my error)

Here is a screen shot of the balance sheet section of one XBRL-based financial filing[221] which shows how that filing has each of these fundamental accounting concepts and satisfies the relations between each of those fundamental accounting concepts. Visit the link to see the entire set of fundamental accounting concepts for this filing.

Balance Sheet Unclassified

Label	Value	Origin
Current Assets	101,466,000,000	
Noncurrent Assets	40,965,000,000	fac:NoncurrentAssets[40,965,000,000 USD] = fac:Assets[142,431,000,000 USD] - fac:CurrentAssets[101,466,000,000 USD]
Assets	142,431,000,000	
Current Liabilities	37,417,000,000	
Noncurrent Liabilities	26,070,000,000	fac:NoncurrentLiabilities[26,070,000,000 USD] = fac:Liabilities[63,487,000,000 USD] - fac:CurrentLiabilities[37,417,000,000 USD]
Liabilities	63,487,000,000	
Commitments and Contingencies	0	
Temporary Equity	0	fac:TemporaryEquity[0] := 0
Redeemable Noncontrolling Interest	0	fac:RedeemableNoncontrollingInterest[0] := 0
Equity Attributable to Parent	78,944,000,000	
Equity Attributable to Noncontrolling Interest	0	fac:EquityAttributableToNoncontrollingInterest[0] := 0
Equity	78,944,000,000	
Liabilities and Equity	142,431,000,000	

The fact that 98% of all concepts and relations are conformed to is interesting. What is more interesting is to look at the conformance to individual relations. Below you can see the relation code, the most current result of testing of these relations on the

[221] Microsoft financial report, see http://app.secxbrl.info/entity/0000789019/information/2013/FY

complete set of public company XBRL-based financial filings, a description of the relation, and comments about the specific relation:

Code	% Conforms	Relation description	Comments
BS1	98.5	Equity = Equity Attributable to Parent + Equity Attributable to Noncontrolling Interest	
BS2	99.7	Assets = Liabilities and Equity	
BS3	96.5	Assets = Current Assets + Noncurrent Assets (classified balance sheet)	
BS4	98.3	Liabilities = Current Liabilities + Noncurrent Liabilities (classified balance sheet)	
BS5	96.0	Liabilities and Equity = Liabilities + Commitments and Contingencies + Temporary Equity + Redeemable Noncontrolling Interest + Equity	
IS1	93.3	Gross Profit = Revenues - Cost Of Revenue (Multi-step approach)	Not applicable to all entities. Alternatively, entities can report using single step approach.
IS2	95.8	Operating Income (Loss) = Gross Profit - Operating Expenses + Other Operating Income (Expenses) (Multi-step approach)	Not applicable to all entities. Alternatively, entities can report using single step approach.
IS3	92.2	Income (Loss) from Continuing Operations Before Equity Method Investments = Operating Income (Loss) + Nonoperating Income (Loss) - Interest And Debt Expense	Not applicable to all entities. Alternatively, entities may not report Operating Income (Loss).
IS4	99.3	Income (Loss) from Continuing Operations Before Tax = Income (Loss) from Continuing Operations Before Equity Method Investments + Income (Loss) from Equity Method Investments	Not applicable to all entities. Alternatively, entities put Income (Loss) from Equity Method Investments after tax, within revenues, and a handful of other locations.
IS5	91.9	Income (Loss) from Continuing Operations after Tax = Income (Loss) from Continuing Operations Before Tax - Income Tax Expense (Benefit)	
IS6	92.2	Net Income (Loss) = Income (Loss) from Continuing Operations After Tax + Income (Loss) from Discontinued Operations, Net of Tax + Extraordinary Items, Gain (Loss)	
IS7	94.7	Net Income (Loss) = Net Income (Loss) Attributable to Parent + Net Income (Loss) Attributable to Noncontrolling Interest	
IS8	99.6	Net Income (Loss) Available to Common Stockholders, Basic = Net Income (Loss) Attributable to Parent - Preferred Stock Dividends and Other Adjustments	
IS9	98.1	Comprehensive Income (Loss) = Comprehensive Income (Loss) Attributable to Parent + Comprehensive Income (Loss) Attributable to Noncontrolling Interest	
IS10	96.4	Comprehensive Income (Loss) = Net Income (Loss) + Other Comprehensive Income (Loss)	

CF1	96.0	Net Cash Flow = Net Cash Flows, Operating + Net Cash Flows, Investing + Net Cash Flows, Financing + Exchange Gains (Losses)	Alternately, approximately 126 entities do not include Exchange Gains (Losses) within Net Cash Flow.
CF2	97.0	Net Cash Flows, Continuing = Net Cash Flows, Operating, Continuing + Net Cash Flows, Investing, Continuing + Net Cash Flows, Financing, Continuing	
CF3	99.6	Net Cash Flows, Discontinued = Net Cash Flows, Operating, Discontinued + Net Cash Flows, Investing, Discontinued + Net Cash Flows, Financing, Discontinued	
CF4	99.6	Net Cash Flows, Operating = Net Cash Flows, Operating, Continuing + Net Cash Flows, Operating, Discontinued	
CF5	99.9	Net Cash Flows, Investing = Net Cash Flows, Investing, Continuing + Net Cash Flows, Investing, Discontinued	
CF6	99.9	Net Cash Flows, Financing = Net Cash Flows, Financing, Continuing + Net Cash Flows, Financing, Discontinued	

HINT: You don't want to turn discovering the fundamental information into a guessing game. You want to make it safe for software applications to gather information. If software cannot sort out this fundamental information, it is unlikely that software will be able to sort out the details. Also, these fundamental concepts are just that, fundamental. There are more of these sorts of relations. These relations are simply a starting point.

24.3.4. Recognize and respect common financial report component arrangement patterns.

Financial report components are related to other financial report components. The discrete set of components which make up a financial report can have a "sequence" or "ordering" or some arrangement. Further, groups of report components exist such as "statement", "disclosure", etc., and are that way are also related.

The SEC interactive data viewer leverages these relations. The SEC viewer also leverages the numbers provided for each network to organize the components of the report. The SEC interactive data viewer separates Level 1 (note level) [Text Block]s, Level 2 accounting policy [Text Block]s, Level 3 (disclosure level) [Text Block]s, and Level 4 detailed disclosures. You can see this leverage in the contents page of the left side of the SEC interactive data viewer. Other viewers likewise leverage this information for sequencing and ordering a digital financial report.

Print Document View Excel Document

- Cover
- Document And Entity Information
- Financial Statements
  - Balance Sheets
  - Balance Sheets (Parenthetical)
  - Statements of Operations
  - Statements of Cash Flows
  - Statement of Stockholders' Deficit
- Notes to Financial Statements
- Accounting Policies
- Notes Tables
- Notes Details
  - Going concern and management's plans (Details Textual)
  - Summary of Significant Accounting Policies (Details)
  - Summary of Significant Accounting Policies (Details 1)
  - Summary of Significant Accounting Policies (D

Document And Entity Information (USD $)	
Document Information [Line Items]	
Entity Registrant Name	NET TALK.COM, INC.
Entity Central Index Key	0001383825
Current Fiscal Year End Date	--12-31
Entity Filer Category	Smaller Reporting Company
Trading Symbol	NTLK
Entity Common Stock, Shares Outstanding	
Document Type	10-K
Amendment Flag	false
Document Fiscal Year Focus	2012
Document Period End Date	Dec. 31, 2012
Document Fiscal Period Focus	FY
Entity Well-known Seasoned Issuer	No
Entity Voluntary Filers	No
Entity Current Reporting Status	No
Entity Public Float	

[1] The aggregate market value of common equity held-by non-affiliates is compu

24.4. Recognize and respect common concept arrangement patterns which indicate how a set of concepts are organized within a [Line Items].

The set of accounting concepts which make up [Line Items] are not random; rather they can be grouped into a set of patterns referred to as concept arrangement patterns. A set of [Line Items] might have one or more sets of concept arrangement patterns. If more than one concept arrangement pattern exists, you can think of each set as a component block. Identified and commonly used concept arrangement patterns include:

- **Roll up**: A concept arrangement pattern with the following form: Fact A + Fact B + Fact C + Fact *N* = Fact D (a total)
- **Roll forward**: A concept arrangement pattern with the following form: Beginning balance + one or more changes = Ending balance
- **Adjustment**: A concept arrangement pattern with the following form: Originally stated balance + one or more adjustments = restated balance

- **Variance**: A concept arrangement pattern with the following form: Actual amount – Budgeted amount = Variance. A variance is a change across a reporting scenario.
- **Complex computation**: A complex computation is a type of concept arrangement pattern where facts are related by some computation other than a roll up, roll forward, adjustment, or variance. For example, Net income / Weighted average shares = Earnings per share.
- **Hierarchy**: A hierarchy is a type of concept arrangement pattern where facts are related in some way, but not mathematically. For example, a set of accounting policies is related in that they are accounting policies, but they have no mathematical relation.
- **Text block**: A [Text Block] is a type of concept arrangement pattern where there is only one fact reported in the form of a [Text Block].

For example, roll up:

Maturities of Long-term Debt [Line Items]	Period [Axis]
	2010-12-31
Maturities of Long-term Debt [Roll Up]	
Current	22,000,000
2012	1,000,000
2013	1,000,000
2014	1,000,000
2015	1,000,000
Thereafter	15,000,000
Total	41,000,000

HINT: Some rendering engines understand more concept arrangement patterns better than others. Some rendering engines separate component blocks better than others.

24.4.1. Recognize and respect common member arrangement patterns.

The set of [Member]s which make up the domain of an [Axis] are not random; they can be grouped into a set of common member arrangement patterns. The [Member]s of an [Axis] tend to be used to differentiate different types of whole-part type relations. While we will only provide summary information about whole-part

relations here, the document *A Taxonomy of Part-Whole Relations*[222] is an excellent reference for understanding these sorts of breakdowns. The presentation *Knowledge Representation for the Semantic Web*[223] provides additional details:

- **Component-integralObject**: Indicates that a component contains some integral object. For example, the component handle is part of the integral object cup; wheels are a component part of a car; a refrigerator is a component of a kitchen.
- **Member-collection**: Indicates that some member is part of some collection. For example a ship is part of a fleet. Or, a subsidiary is part of an economic entity.
- **Portion-mass**: Indicates that some portion is part of some mass. For example a slice is part of a pie.
- **Stuff-object**: Indicates that some "stuff" is part of some object. For example steel is part of a car. (This may not be appropriate or necessary for financial reporting.)
- **Feature-activity**: Indicates that some feature is part of some activity. For example the feature "paying" is part of the activity "shopping".
- **Place-area**: Indicates that some physical place is part of some area. For example the place "Everglades" is part of the area "Florida".

[CSH: It is highly probable that not all these types of relations are important to financial reporting and that financial reporting has specific classes of these sorts of breakdowns. More work is necessary to investigate this.]

These whole-part type relations may, or may not, aggregate across the set of [Member]s within a domain. Some do, some do not. Identified and commonly used aggregation of member arrangement patterns includes:

- **Partial set**: A partial sets are [Member]s of an [Axis] which do not comprise the full spectrum or universe of possible options. For example, "United States" and "Spain" is a partial set of countries. [CSH: I don't think this is a pattern because all sets are complete with respect to a specific financial report.]
- **Complete flat set**: A complete flat set is a "flat" (meaning no sub-relations) and complete list of [Member]s of an [Axis]. For example, a listing of all the business segments could be a complete flat set if it is (a) complete and (b) it is one flat list with no sub relations.
- **Complete hierarchical set**: A complete hierarchical set is like a complete flat set in that it is complete; however a complete hierarchical set does have sub relations making it hierarchical as compared to flat. For example, a list of the countries which make up the geographic areas of a reporting entity which is further grouped by regions into which each country fits is a complete hierarchical set.

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[222] *A Taxonomy of Part-Whole Relations*, http://csjarchive.cogsci.rpi.edu/1987v11/i04/p0417p0444/MAIN.PDF

[223] *Knowledge Representation for the Semantic Web*, http://www.semantic-web-book.org/w/images/3/35/W2012-07-partonomies.pdf

- **Complete complex set**: A complete complex set is like a complete flat and complete hierarchical set in that it is complete; however the hierarchy of relations is not flat nor a simple one-level hierarchy but rather the hierarchy has multiple levels and is therefore considered complex.

Only "flat sets" should be used as XBRL has no way of articulating the meaning of relations between [Member]s within a set of [Member]s.

HINT: Only flat sets of [Member]s should be used because XBRL has now specific way, other than XBRL Formula, to articulate a hierarchy of [Member]s. So, rather than creating one [Axis] with a hierarchy, create two [Axis] to express the different hierarchies.

Recognize that there are different types of relationships between [Member]s. One big issue with XBRL presentation relations in general and the US GAAP Taxonomy in particular is the vagueness of the "parent-child" relationship which is used to express relationships.

Basically, the arcrole "http://www.xbrl.org/2003/arcrole/parent-child" used to communicate that there is in fact some sort of relationship leaves open to interpretation exactly what that relation is and what the relation means. While what is expressed might be clear to those who use the "parent-child" relationship to express something; the intent tends to not come through, be misinterpreted, be inconsistent because of different people working on different areas of a taxonomy, and in general leads to confusion.

24.4.2. Avoid mixing or run-together concept arrangement patterns.

Mixing more than one concept arrangement pattern together increases the difficulty of reading disclosure information. While running different patterns together is not illegal per SEC XBRL filing rules, doing this can cause challenges to rendering engines trying to present the information in human readable form and cause information to be hard to comprehend.

For example, mixing a "roll up" and a "roll forward" should be avoided as information appears to run together and is hard to understand. For example, representing a roll up which then runs into a roll forward or two distinct roll ups together without differentiating them should be avoided.

Avoid doing this:

http://www.sec.gov/Archives/edgar/data/47217/000104746912011417/0001047469-12-011417-index.htm

Commitments (Details) (USD $) In Millions, unless otherwise specified	12 Months Ended		
	Oct. 31, 2012	Oct. 31, 2011	Oct. 31, 2010
Commitments			
Rent expense	$ 1,012	$ 1,042	$ 1,062
Sublease rental income	37	38	46
Property under capital lease	882	577	
Accumulated depreciation on property under capital lease	453	454	
Minimum lease payments, sublease rental income			
Minimum lease payments, 2013	780		
Minimum lease payments, 2014	665		
Minimum lease payments, 2015	517		
Minimum lease payments, 2016	351		
Minimum lease payments, 2017	218		
Minimum lease payments, thereafter	805		
Minimum lease payments, total	3,336		
Less: Sublease rental income, 2013	(28)		
Less: Sublease rental income, 2014	(23)		
Less: Sublease rental income, 2015	(18)		
Less: Sublease rental income, 2016	(9)		
Less: Sublease rental income, 2017	(4)		
Less: Sublease rental income, thereafter	(12)		
Sublease rental income, total	(94)		
Minimum lease payments net of sublease rental income, 2013	752		
Minimum lease payments net of sublease rental income, 2014	642		
Minimum lease payments net of sublease rental income, 2015	499		
Minimum lease payments net of sublease rental income, 2016	342		
Minimum lease payments net of sublease rental income, 2017	214		
Minimum lease payments net of sublease rental income, thereafter	793		
Minimum lease payments net of sublease rental income, total	3,242		
Capital lease commitments			
Capital lease commitments, 2013	59		
Capital lease commitments, 2014	240		
Capital lease commitments, 2015	11		
Capital lease commitments, 2016	7		
Capital lease commitments, 2017	4		
Capital lease commitments, thereafter	33		
Capital lease commitments, total	354		
Less: Interest payments, 2013	(8)		
Less: Interest payments, 2014	(6)		
Less: Interest payments, 2015	(3)		
Less: Interest payments, 2016	(2)		
Less: Interest payments, 2017	(2)		
Less Interest payments, thereafter	(12)		
Interest payments, total	(33)		

Instead, try this:

http://www.sec.gov/Archives/edgar/data/1285785/000119312512323518/0001193125-12-323518-index.htm

Concept	Period [Axis]		
	2011-06-01 - 2012-05-31	2010-06-01 - 2011-05-31	2009-06-01 - 2010-05-31
Unrecorded Unconditional Purchase Obligation [Abstract]			
2012	1,874,000,000		
2013	315,800,000		
2014	176,600,000		
2015	117,700,000		
2016	107,400,000		
Subsequent years	2,099,900,000		
Total	4,691,400,000		
A schedule of future minimum lease payments under non-cancelable operating leases follows:			
2012	41,100,000		
2013	24,600,000		
2014	16,300,000		
2015	10,200,000		
2016	6,300,000		
Subsequent years	13,900,000		
Total	112,400,000		
Rental expense and purchases made for the fiscal period were as follows:			
Rental expense for the fiscal period			
Purchases made under long-term commitments during the reporting period	3,100,000,000	2,200,000,000	1,300,000,000
Contracts Revenue	158,200,000	186,800,000	66,100,000
Surety Bonds Outstanding [Abstract]			
Surety bonds outstanding for mining reclamation obligations	171,300,000		
Surety bonds outstanding for other than mining reclamation obligations	13,900,000		
Total amount of surety bonds outstanding	185,200,000		

24.4.3. Avoid mixing distinct characteristics and concepts.

Representing what should be two distinct and unrelated disclosures within one report component should be avoided. For example, many filers represent preferred and common stock together within one report components when two distinct and separate report components are called for.

Avoid this:

http://www.sec.gov/Archives/edgar/data/896878/000089687812000146/0000896878-12-000146-index.htm

Period [Axis]	Debt Instrument [Line Items]	Long-term Debt, Type [Axis]					
		Operating Lease Expense [Member]	Purchase Commitment [Member]	Long-term Debt, Type [Domain]			
		Debt Instrument [Axis]	Debt Instrument [Axis]	Debt Instrument [Axis]			
		Debt Instrument, Name [Domain]	Debt Instrument, Name [Domain]	5.40 percent fixed-rate notes due 2012 [Member]	5.75 percent fixed-rate notes due 2017 [Member]	Debt Instrument, Name [Domain]	
		Investment Type [Axis]	Investment Type [Axis]	Investment Type [Axis]	Investment Type [Axis]	Investment Type [Axis]	
		Investment Type Categorization [Domain]	Investment Type Categorization [Domain]	Investment Type Categorization [Domain]	Investment Type Categorization [Domain]	Senior Notes [Member]	Investment Type Categorization [Domain]
2011-08-01 - 2012-07-31	**Long Term Obligations And Commitments (Textuals)**						
	Senior notes			0	500,000,000		500,000,00
	Senior notes, rate						
	Interest paid					56,000,000	60,000,0
	Cash paid to license technology						10,000,000
	Period for contractual maturities of senior notes						
	Unamortized discounts on senior notes						(1,000,00
	Amount payable over next ten fiscal years for agreement to license technology						
	Present value of license technology agreement						
	Years lease term can be extended under lease option						
	Operating leases, rent expense						51,000,00
	Reported as:						
	Current portion of long-term debt						
	Long-term debt						499,000,000
	Total senior notes						499,000,000
	Other long-term obligations						
	Total license fee payable						54,000,00
	Total deferred rent						53,000,000
	Long-term deferred revenue						42,000,0
	Long-term income tax liabilities						41,000,0
	Other						5,000,0
	Total						5,000

The rendering of the rendering engine above is poor because the representation of the information is poor.

Consider this extreme example. Below, a filer uses both the "Finite-lived intangible asset Type [Axis]" and the "Indefinite-lived intangible assets Type [Axis]" on the same report component. A fact can never be both a finite-lived and an indefinite-lived intangible asset.

http://www.sec.gov/Archives/edgar/data/866273/000086627313000057/0000866273-13-000057-index.htm

Component: (Network and Table)	
Network	2404403 - Disclosure - Goodwill and Other Intangible Assets (Details 1) (http://www.matrixservice.com/role/GoodwillAndOtherIntangibleAssetsDetails1)
Table	Schedule of Finite-Lived Intangible Assets [Table]

Slicers (applies to each fact value in each table cell)

Reporting Entity [Axis]	0000866273 (http://www.sec.gov/CIK)

Period [Axis]	Finite-Lived Intangible Assets [Line Items]	Finite-Lived Intangible Assets by Major Class [Axis]														
		Intellectual Property [Member]			Customer Relationships [Member]	Customer Based [Member]			Noncompete Agreements [Member]			Trade Names [Member]	Finite-Lived Intangible Assets, Major Class Name [Domain]			
		Indefinite-lived Intangible Assets by Major Class [Axis]			Indefinite-lived Intangible Assets by Major Class [Axis]	Indefinite-lived Intangible Assets by Major Class [Axis]			Indefinite-lived Intangible Assets by Major Class [Axis]			Indefinite-lived Intangible Assets by Major Class [Axis]	Indefinite-lived Intangible Assets by Major Class [Axis]			
		Indefinite-lived Intangible Assets, Major Class Name [Domain]			Indefinite-lived Intangible Assets, Major Class Name [Domain]	Indefinite-lived Intangible Assets, Major Class Name [Domain]			Indefinite-lived Intangible Assets, Major Class Name [Domain]			Indefinite-lived Intangible Assets, Major Class Name [Domain]	Trade Names [Member]	Indefinite-lived Intangible Assets, Major Class Name [Domain]		
		Range [Axis]			Range [Axis]	Range [Axis]			Range [Axis]			Range [Axis]	Range [Axis]	Range [Axis]		
		Minimum [Member]	Maximum [Member]	Range [Domain]	Range [Domain]	Minimum [Member]	Maximum [Member]	Range [Domain]	Minimum [Member]	Maximum [Member]	Range [Domain]	Range [Domain]	Range [Domain]	Minimum [Member]	Maximum [Member]	Range [Domain]
2012-07-01 - 2013-06-30	Finite-lived Intangible Assets, Fair Value Disclosure				1,600,000						300,000					
	Carrying value of other intangible assets															
	Useful life of intangible assets	P6Y	P15Y			P1Y	P15Y		P3Y	P5Y		P5Y		P1Y	P15Y	
	Gross carrying amount			2,460,000				4,250,000			808,000	165,000				7,683,000
	Accumulated amortization			(753,000)				(542,000)			(287,000)	0				(1,582,000)
	Net carrying amount			1,707,000				3,708,000			521,000	165,000				6,101,000
	Indefinite-lived trade names												1,450,000			
	Intangible assets, gross, excluding Goodwill															9,133,000
	Accumulated amortization - Intangible assets, excluding Goodwill															(1,582,000)
	Intangible assets, net, excluding Goodwill															7,551,000
2011-07-01 - 2012-06-30	Finite-lived Intangible Assets, Fair Value Disclosure															
	Carrying value of other intangible assets															
	Useful life of intangible assets	P6Y	P15Y			P1Y	P15Y		P3Y	P5Y						
	Gross carrying amount			2,460,000				2,657,000			547,000					5,664,000
	Accumulated amortization			(586,000)				(285,000)			(159,000)					(1,030,000)
	Net carrying amount			1,874,000				2,372,000			388,000					4,634,000
	Indefinite-lived trade names												1,870,000			
	Intangible assets, gross, excluding Goodwill															7,534,000
	Accumulated amortization - Intangible assets, excluding Goodwill												xsi:nil			(1,030,000)
	Intangible assets, net, excluding Goodwill															6,504,000

24.4.4. Recognize need for both automated and manual verification processes.

The processes used for verification of the "true and fair representation" of financial information can take two general forms: automated processes performed using machines and manual processes performed by humans.

Automated verification processes are preferable because they are more reliable and dependable, they take less time, and they cost less than manual processes. Verification can be automated only to the extent rules are provided to verify aspects of a digital financial report. No financial report can be verified 100% using automated processes and therefore manual verification is always necessary. The following is a summarized version of automated and manual verification tasks[224]:

#	Verification/validation task	Automatable	Manual
1	Valid XBRL technical syntax	X	
2	Edgar Filer Manual (EFM) valid	X	X
3	Fiscal period, balance sheet date, income statement date valid	X	
4	Root economic entity (entity of focus) discovered	X	
5	Fundamental accounting concepts and relations valid	X	
6	Industry specific accounting concepts and relations valid	X	X
7	Report level model structure valid	X	
8	Primary financial statements discovered	X	X
9	Primary financial statements foot and roll forward appropriately	X	
10	Required disclosures discovered	X	
11	Each SEC Level 3 [Text Block] and SEC Level 4 detail disclosure match	X	X
12	Each SEC Level 4 detail disclosure valid	X	X
13	Current report prior year facts match prior report current year reported facts	X	
14	Variance from prior periods analysis OK	X	X
15	Variance analysis from peers OK	X	X
16	Report-ability rules have been met	X	X
17	SEC Level 1 footnote disclosures appropriate		X
18	SEC Level 2 policy text block disclosures appropriate		X
19	Report element selection appropriate (justifiable/defensible)		X
20	Reported facts appropriate		X
21	Consistency with peers appropriate		X
22	Consistency with prior periods appropriate		X
23	True and fair representation of financial information of economic entity		X

[224] For more information see, http://www.xbrlsite.com/2014/Library/DisclosureChecklist.pdf

The following is a more detailed explanation of verification tasks which must be performed and organized in a different manner:

- **Comply with US GAAP**: Clearly a financial report must comply with the rules of US GAAP including SEC rules, industry/activity practices, other common practices, and reporting entity choices where they have such choices.
- **Full inclusion/false inclusion**: Everything which should be disclosed has been disclosed as deemed appropriate by US GAAP, SEC, industry/activity practices, common practices, and reporting entity choices.
- **Foots, cross casts, ticks and ties**: A financial report foots, cross casts, and otherwise "ticks and ties". All mathematical relations must be intact. As accountants we understand this and many times this fact disappears into our unconsciousness because it is so ingrained into what we do and how we do it. Of course things foot and cross cast; of course the pieces tie together.
- **All financial report formats convey the same message**: A financial report can be articulated using paper and pencil, Microsoft Word, PDF, HTML, XBRL, RDF/OWL, or some other computer readable or computer readable formats. While the format may change, the message communicated, the story you tell, should not change. Each format should communicate the same message, regardless of the medium used to convey your message.
- **Justifiable/defensible report characteristics**: Facts reported and the characteristics which describe those reported facts should be both justifiable and defensible by the reporting entity.
- **Consistency between periods**: Financial information expressed within one reporting period should be consistent with the financial information expressed within subsequent reporting periods, where appropriate. Clearly new information will be added and information which becomes irrelevant will be removed from a financial report. Changes between report elements which existed in both periods should be justifiable and defensible as opposed to arbitrary and random.
- **Consistency with peer group**: If a reporting entity chooses one approach/report element and a peer chooses a different approach/report element; clearly some good, explainable reason should exist for such difference. The judgment of an accountant can determine if the difference is appropriate or not. Differences of opinion can also exist. However, some sort of rational will likely exist for differences or similarities. Because of ambiguity, different conclusions can be reached and each be reasonable and appropriate.
- **Logical representations indicated by understandable renderings**: Renderings of facts; characteristics describe facts; parenthetical explanations which further describe such facts; and other such model structures should make sense and be both consistent with other similar logical structures and logical from the perspective of the technical syntax used to articulate that information. While there may be differences of opinion as to how to format or present such information; there should be significantly less or no dispute about the logic. Disclosures are informational, they relate to information without regard to formatting or other presentational artifacts. Notes relate to organizing disclosures and are presentational in nature. Someone creating a financial report has far more latitude and discretion as to how to organize disclosures into notes than they do as to what must be disclosed.

- **Unambiguous business meaning**: A financial report should be unambiguous to an informed reader. The business meaning of a financial report should be clear/unambiguous to the creator of the financial report and likewise clear/unambiguous to the users of that financial report. Both the creator and users should walk away with the same message or story. A financial report should be usable by regulators, financial institutions, analysts, investors, economists, researchers, and others who desire to make use of the information the report contains.

The following is a set of criteria which is verified using 100% automated processes and the results obtained from the 6,644 XBRL-based financial filings verified by the processes[225]:

#	Goal or Desired State	Process tests	Current State
1	Consistent XBRL technical syntax	Automated XBRL technical syntax error checks	99.9% meet the criteria of consistent XBRL technical syntax rules and are therefore fundamentally readable documents
2	Consistent EDGAR Filer Manual (EFM) syntax/semantics	Automated EFM syntax and semantics error checks	97.9% meet the criteria of specified automatable SEC EDGAR Filer Manual (EFM) rules
3	Consistent report level structure	Automated model structure error checks	99.9% meet the criteria of consistent and unambiguous report level model structure relations
4	Detectable exonomic entity or accounting entity or "root reporting entity" or "entity of focus"	Successful and unambiguous identification of the "entity of focus"	99.2% provide a detectable "root of reporting entity" so that information can be properly discovered using automated processes
5	Detectable and unambigous current period balance sheet and income statement period dates	Successful and unambiguous identification of the current balance sheet date and income statement period	99.3% provide a detectable and unambiguous current balance sheet date
6	Detectable and unambigous set of fundamental reported facts and intact relations between those fundamental facts which prove trustworthy nature of information	Automated verification checks to be sure fundamental accounting concepts are distinguishable/decipherable and the relations between those fundamental concepts are intact/sound	97.8% consistently report or provide enough information to impute 51 fundamental accounting concepts and those concepts consistently adhere to 21 basic accounting relationships
7	Detectable basic primary financial statement roll up computations are intact which prove trustworthy nature of information	Automated verification checks for existence of business rules which articulate these basic primary financial statement relations and successful passing of these business rules	90.1% provide detectable roll up rules for balance sheet, income statement, cash flow statement

24.4.5. Recognize that concepts cannot be moved between fundamental accounting concept categories or classes.

Concepts defined as one class of financial reporting concept by the US GAAP XBRL Taxonomy cannot be redefined to be within some other class of financial reporting concept. For example, a "nonoperating income (expense)" concept cannot be used as an "operating income (expense) concept."

[225] *Understanding the Minimum Processing Tests*, http://www.xbrlsite.com/2014/Library/UnderstandingMinimumProcessSteps-2014-02-14.pdf

While the US GAAP XBRL Taxonomy does not explicitly or formally "map" each taxonomy concept to a fundamental concept (i.e. define class-subclass relations), the relations are implicit. Both the presentation relations, but more likely the calculation relations which exist in the taxonomy implicitly articulate this information.

HINT: Generally when a reporting entity moves the concept *Interest and Debt Expense* to be included within *Nonoperating Income (Loss)* the reason is because there is a concept missing from the US GAAP XBRL Taxonomy. The missing concept is essentially *Nonoperating Income (Loss) Including Interest and Debt Expense* which combines the two concepts.

Each concept created within a reporting entity taxonomy should be associated with some fundamental accounting concept. For example, all concepts defined which are an asset should be specifically defined as such using perhaps a "class-subclass" type relation or the existing "general-special" relation defined by XBRL.

This can be achieved using the XBRL definition linkbase.

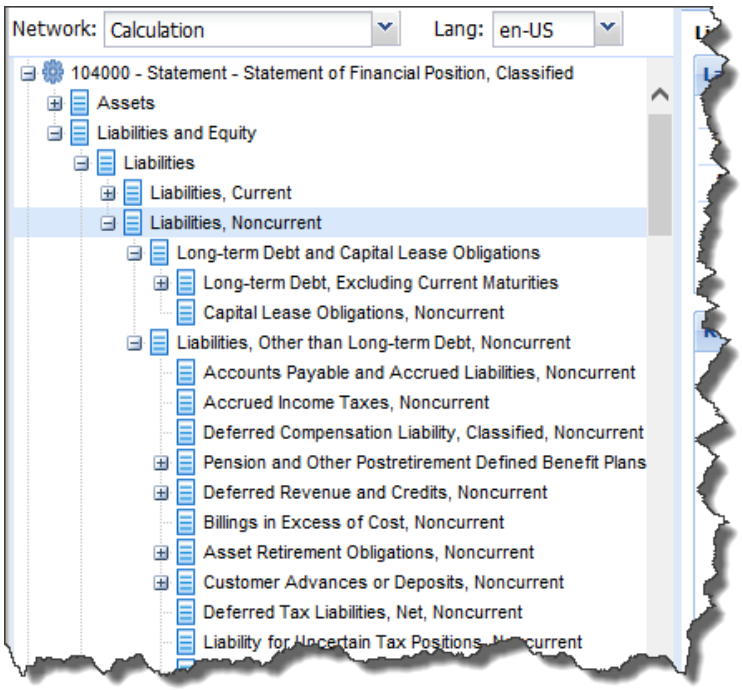
[CSH: This needs to be reworked, but I don't want to lose this idea.]

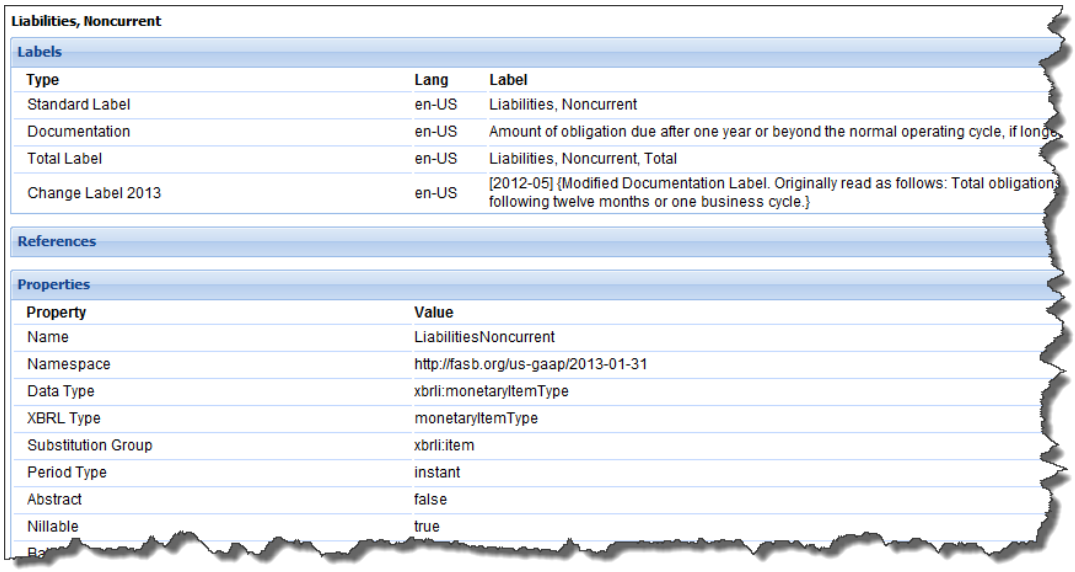
Here is an example of a violation of the use of a fundamental accounting concept. The summary of the situation is that Procter & Gamble uses the concept "us-gaap:LiabilitiesNoncurrent" to express not the total of noncurrent liabilities like 99.9% of SEC filers do who provide that balance sheet line item and not like the US GAAP XBRL Taxonomy clearly specifies that item; rather Procter & Gamble uses that concept to express what they have labeled in their filing "Other Non-Current Liabilities". They do provide "Total Liabilities, Noncurrent" using the concept "us-gaap:OtherLiabilitiesNoncurrent"; however, that concept also uses an incorrect concept. This line item also is not on the balance sheet.

This is the Procter & Gamble XBRL submission: http://goo.gl/zMYDo6

This will let you look at the submission using the XBRL Cloud Viewer: http://goo.gl/A9fo9u

US GAAP XBRL Taxonomy shows relations for "us-gaap:LiabilitiesNoncurrent" as being part of "us-gaap:Liabilities" (i.e. Current liabilities + Noncurrent liabilities = Total liabilities) http://goo.gl/stJYn4





Liabilities, Noncurrent

Labels

Type	Lang	Label
Standard Label	en-US	Liabilities, Noncurrent
Documentation	en-US	Amount of obligation due after one year or beyond the normal operating cycle, if longe
Total Label	en-US	Liabilities, Noncurrent, Total
Change Label 2013	en-US	[2012-05] {Modified Documentation Label. Originally read as follows: Total obligation following twelve months or one business cycle.}

References

Properties

Property	Value
Name	LiabilitiesNoncurrent
Namespace	http://fasb.org/us-gaap/2013-01-31
Data Type	xbrli:monetaryItemType
XBRL Type	monetaryItemType
Substitution Group	xbrli:item
Period Type	instant
Abstract	false
Nillable	true

SEC Interactive Data Viewer:

SUPPLEMENTAL FINANCIAL INFORMATION Other Liabilities (Details) (USD $) In Millions, unless otherwise specified	Jun. 30, 2013	Jun. 30, 2012
OTHER NONCURRENT LIABILITIES		
Pension benefits	$ 6,027	$ 5,684
Other postretirement benefits	1,713	3,270
Uncertain tax positions	2,002	2,245
Other Non-Current Liabilities	837	891

- Definition
Total obligations incurred as part of normal operations that is expected to be repaid beyond the following twelve months or one business cycle.

+ References
- Details
Name: us-gaap_LiabilitiesNoncurrent
Namespace Prefix: us-gaap_
Data Type: xbrli:monetaryItemType
Balance Type: credit
Period Type: instant

XBRL Cloud Viewer showing balance sheet:

Reporting Entity [Axis] | 0000080424 (http://www.sec.gov/CIK)
Legal Entity [Axis] | Entity [Domain]

Statement [Line Items]	Period [Axis] 2013-06-30 Class of Stock [Axis] Class of Stock [Domain]	Period [Axis] 2012-06-30 Class of Stock [Axis] Class of Stock [Domain]
Assets		
CURRENT ASSETS		
Cash and cash equivalents	5,947,000,000	4,436,000,000
Accounts receivable		
INVENTORIES		
Materials and supplies		
Work in process		
Finished goods		
Total inventories		
Deferred income taxes		
Prepaid expenses and other current assets		
TOTAL CURRENT ASSETS		
NET PROPERTY, PLANT AND EQUIPMENT		
Goodwill, Net		
Trademarks and other intangible assets, net		
OTHER NONCURRENT ASSETS		
TOTAL ASSETS		
Liabilities and Shareholders' Equity		
CURRENT LIABILITIES		
Accounts payable	8,777,000,000	7,920,000,000
Accrued and other liabilities	8,828,000,000	8,289,000,000
Debt due within one year	12,432,000,000	8,698,000,000
TOTAL CURRENT LIABILITIES	30,037,000,000	24,907,000,000
LONG-TERM DEBT	19,111,000,000	21,080,000,000
DEFERRED INCOME TAXES	10,827,000,000	10,132,000,000
OTHER NONCURRENT LIABILITIES	10,579,000,000	12,090,000,000
TOTAL LIABILITIES	70,554,000,000	68,209,000,000

Period [Axis]
Class of Stock [Axis]

Report Element
Properties | Occurrences

Documentation:	Aggregate carrying amount, as of the balance sheet date, of noncurrent obligations not separately disclosed in the balance sheet. Noncurrent liabilities are expected to be paid after one year (or the normal operating cycle, if longer).
Report Element Class	Concept
Prefix (From Taxonomy)	us-gaap
Balance Type	Credit
Period Type	As Of (instant)
Data Type	Monetary (xbrli:monetaryItemType)
Name	us-gaap:OtherLiabilitiesNoncurrent
ID	us-gaap_OtherLiabilitiesNoncurrent

Labels of Report Element

Disclosure of "Other Liabilities" using XBRL Cloud Viewer:

File View Window Help

PROCTER & GAMBLE CO (10-K) *2403405 - Disclosure - SUPPLEMENTAL FINANCIAL INFORMATION Other Liabilities (Details)* SUPPLEMENTAL FINANCIAL INFORMATION Other

Components

- *AMORTIZATION EXPENSE (DETAILS)* GOODWILL AND INTANGIBLE ASSETS - ESTIMATED AMORTIZATION EXPENSE (DETAILS) [Table]
- *2403402 - Disclosure - SUPPLEMENTAL FINANCIAL INFORMATION (DETAILS)* Schedule of Restructuring and Related Costs [Table]
- *2403403 - Disclosure - SUPPLEMENTAL FINANCIAL INFORMATION SUPLEMENTAL FINANCIAL INFORMATION - Additional Information (Details)* Schedule of Restructuring and Related Costs [Table]
- *2403404 - Disclosure - SUPPLEMENTAL FINANCIAL INFORMATION Schedule of Property, Plant & Equipment (Details)* Schedule of Property, Plant and Equipment [Table]
- ***2403405 - Disclosure - SUPPLEMENTAL FINANCIAL INFORMATION Other Liabilities (Details)*** **SUPPLEMENTAL FINANCIAL INFORMATION Other Liabilities (Details) [Table]**
- *2404402 - Disclosure - SHORT-TERM AND LONG-TERM DEBT - SHORT-TERM DEBT (DETAILS)* Statement [Table]
- *2404403 - Disclosure - SHORT-TERM AND LONG-TERM DEBT - LONG-TERM DEBT (DETAILS)* Statement [Table]
- *2404404 - Disclosure - SHORT-TERM AND LONG-TERM DEBT - LONG-TERM DEBT MATURITIES (DETAILS)* Statement [Table]

Rendering

Reporting Entity [Axis]	0000080424 (http://www.sec.gov/CIK)	
	Period [Axis]	
Other Liabilities Disclosure [Abstract]	2013-06-30	2012-06-30
Other Liabilities Disclosure [Abstract]		
OTHER NONCURRENT LIABILITIES		
Pension benefits	6,027,000,000	5,684,000,000
Other postretirement benefits	1,713,000,000	3,270,000,000
Uncertain tax positions	2,002,000,000	2,245,000,000
Other Non-Current Liabilities	837,000,000	891,000,000
Total Liabilities, Noncurrent	10,579,000,000	12,090,000,000
ACCRUED AND OTHER LIABILITIES - CURRENT		
Marketing and promotion		
Compensation expenses		
Restructuring Reserve		
Taxes payable		
Legal and environmental		
Other		
TOTAL		

Period [Axis]

Report Element

Properties | Occurrences

Documentation:	Total obligations incurred as part of normal operations that is expected to be repaid beyond the following twelve months or one business cycle.
Report Element Class	Concept
Prefix (From Taxonomy)	us-gaap
Balance Type	Credit
Period Type	As Of (instant)
Data Type	Monetary (xbrli:monetaryItemType)
Name	us-gaap:LiabilitiesNoncurrent
ID	us-gaap_LiabilitiesNoncurrent

Labels of Report Element

From	Role	Label	Lang

Total Liabilities, Noncurrent:

Reporting Entity [Axis]	0000080424 (http://www.sec.gov/CIK)	
	Period [Axis]	
Other Liabilities Disclosure [Abstract]	2013-06-30	2012-06-30
Other Liabilities Disclosure [Abstract]		
OTHER NONCURRENT LIABILITIES		
Pension benefits	6,027,000,000	5,684,000,000
Other postretirement benefits	1,713,000,000	3,270,000,000
Uncertain tax positions	2,002,000,000	2,245,000,000
Other Non-Current Liabilities	837,000,000	891,000,000
Total Liabilities, Noncurrent	10,579,000,000	12,090,000,000
ACCRUED AND OTHER LIABILITIES - CURRENT		
Marketing and promotion		
Compensation expenses		
Restructuring Reserve		
Taxes payable		
Legal and environmental		
Other		
TOTAL		

Period [Axis]

Report Element

Properties | Occurrences

Documentation:	Aggregate carrying amount, as of the balance sheet date, of noncurrent obligations not separately disclosed in the balance sheet. Noncurrent liabilities are expected to be paid after one year (or the normal operating cycle, if longer).
Report Element Class	Concept
Prefix (From Taxonomy)	us-gaap
Balance Type	Credit
Period Type	As Of (instant)
Data Type	Monetary (xbrli:monetaryItemType)
Name	us-gaap:OtherLiabilitiesNoncurrent
ID	us-gaap_OtherLiabilitiesNoncurrent

Labels of Report Element

Fundamental accounting concept validation shows that 99.9% of SEC XBRL filers use the concept "us-gaap:LiabilitiesNoncurrent" to represent "Total noncurrent liabilities", not a detailed component within total noncurrent liabilities (as Procter & Gamble did):

Test	Fundamental accounting relationship (business rule)	Total set	No root entity	Exclude	Total set	Pass test	Percent	Comments	Fail tes
BS1	Equity = EquityAttributableToParent + EquityAttributableToNoncontrollingInterest	7,160	58	0	7,102	7,003	98.6%		99
BS2	Assets = LiabilitiesAndEquity	7,160	58	0	7,102	7,061	99.4%		41
BS3	Assets = CurrentAssets + NoncurrentAssets	7,160	58	1,631	5,471	5,469	100.0%	Not all filers have classified balance sheets. Unclassified balance sheets excluded.	2
BS4	Liabilities = CurrentLiabilities + NoncurrentLiabilities	7,160	58	1,631	5,471	5,467	99.9%	Not all filers have classified balance sheets. Unclassified balance sheets excluded.	4
BS5	LiabilitiesAndEquity = Liabilities + CommitmentsAndContingencies+ TemporaryEquity+ Equity	7,160	58	0	7,102	6,807	95.8%		295
IS1	GrossProfit = Revenues - CostOfRevenue	7,160	412	3,403	3,345	2,946	88.1%	Not all filers use multi-step income statement. Exclude overlapping statements/missing concepts	399

24.4.6. Recognize that concepts reported within a financial report can be grouped into useful sets or classes.

SFAC 6 breaks a financial statement into groups of 10 elements: assets, liabilities, equity, investments by owners, distributions to owners, comprehensive income, revenues, expenses, gains, losses. These elements are 'the building blocks' with which financial statements are constructed - the classes of items that financial statements comprise. (Elements of Financial Statements. Statement of Financial Accounting Concepts No. 6 (Stamford, Conn.: FASB, 1985, par. 5.)

A classification scheme is an arrangement of types or sets of things into useful groups[226]. SFAC 6 elements are an example of such groups. 'Assets' is one group. 'Revenues' is another group. Something cannot be both an asset and revenue. While these 10 elements defined by the FASB are not the appropriate set of elements for defining an entire digital financial report, they do serve as a very useful starting point. Consider the fundamental accounting concepts as a useful expansion of the 10 elements defined by the FASB. So, rather than just *assets*, we now have *current assets* and *noncurrent assets*. The point is, I am not trying to articulate the list of classes; I am simply pointing out the notion of class by providing a list of things that certainly appear to be useful classes.

In observing the concepts you start to see some important differences between the sets of concepts[227]. The sets seem to have four important properties and different sets have different properties:

- Concept is required to be reported
- Concept may redefine or replace
- New concept may be created
- New subclasses may be created for concept

For example, consider the concept *Operating Income (Loss)*. Is that concept required to be reported? NO, reporting operating income (loss) is not required; proof of that is that many filers do NOT report operating income (loss). May a filer redefine or replace the concept operating income (loss)? NO; observing public company financial reports shows this to be true. May a filer create a new concept to

[226] For more information see, http://www.xbrlsite.com/2014/Prototype/Classes/

[227] For more information see, http://xbrl.squarespace.com/journal/2014/12/31/understanding-the-benefits-of-classification.html

replace the existing concept? NO; why would they do that? Can a filer add a subclass? NO; there is no real subclass of that concept.

Financial statement location	Concept	Required to report	May redefine or replace	May create new	May add new subclass
Balance sheet	Assets	YES	NO	NO	YES
Balance sheet	Commitments And Contingencies	NO	NO	NO	NO
Balance sheet	Current Assets	YES	NO	NO	YES
Balance sheet	Current Liabilities	YES	NO	NO	YES
Balance sheet	Equity	YES	NO	NO	NO
Balance sheet	Equity Attributable To Noncontrolling Interest	NO	NO	NO	YES
Balance sheet	Equity Attributable To Parent	NO	NO	NO	YES
Balance sheet	Liabilities	NO	NO	NO	NO
Balance sheet	Liabilities And Equity	YES	NO	NO	NO
Balance sheet	Noncurrent Assets	NO	NO	NO	YES
Balance sheet	Noncurrent Liabilities	NO	NO	NO	YES
Balance sheet	Redeemable Noncontrolling Interest	NO	NO	NO	NO
Balance sheet	Temporary Equity	NO	NO	NO	NO
Cash flow statement	Exchange Gains (Losses)	NO	NO	NO	YES
Cash flow statement	Net Cash Flow	YES	NO	NO	NO
Cash flow statement	Net Cash Flow From Financing Activities	YES	NO	NO	NO
Cash flow statement	Net Cash Flow From Financing Activities, Continuing	NO	NO	NO	YES
Cash flow statement	Net Cash Flow From Financing Activities, Discontinued	NO	NO	NO	YES
Cash flow statement	Net Cash Flow From Investing Activities	YES	NO	NO	NO
Cash flow statement	Net Cash Flow From Investing Activities, Continuing	NO	NO	NO	YES
Cash flow	Net Cash Flow From Investing Activities, Discontinued	NO	NO	NO	YES

Financial statement location	Concept	Required to report	May redefine or replace	May create new	May add new subclass
statement					
Cash flow statement	Net Cash Flow From Operating Activities	YES	NO	NO	NO
Cash flow statement	Net Cash Flow From Operating Activities, Continuing	NO	NO	NO	YES
Cash flow statement	Net Cash Flow From Operating Activities, Discontinued	NO	NO	NO	YES
Cash flow statement	Net Cash Flow, Continuing	NO	NO	NO	NO
Cash flow statement	Net Cash Flow, Discontinued	NO	NO	NO	NO
Comprehensive income	Comprehensive Income (Loss)	NO	NO	NO	NO
Comprehensive income	Comprehensive Income (Loss) Attributable To Noncontrolling Interest	NO	NO	NO	NO
Comprehensive income	Comprehensive Income (Loss) Attributable to Parent	NO	NO	NO	NO
Comprehensive income	Other Comprehensive Income (Loss)	NO	NO	NO	YES
Income statement	Benefits Costs and Expenses	NO	NO	NO	YES
Income statement	Cost Of Revenue	NO	NO	NO	YES
Income statement	Costs And Expenses	NO	NO	NO	YES
Income statement	Extraordinary Items Of Income (Expense), Net Of Tax	NO	NO	NO	YES
Income statement	Gain (Loss) On Sale of Properties, Net of Tax	NO	NO	NO	YES
Income statement	Gross Profit	NO	NO	NO	NO
Income statement	Income (Loss) Before Equity Method Investments	NO	NO	NO	NO
Income statement	Income (Loss) From Continuing Operations After Tax	YES	NO	NO	NO
Income statement	Income (Loss) From Continuing Operations Before Tax	YES	NO	NO	NO
Income statement	Income (Loss) From Discontinued Operations, Net Of Tax	NO	NO	NO	NO
Income statement	Income (Loss) From Equity Method Investments	NO	NO	NO	NO

Financial statement location	Concept	Required to report	May redefine or replace	May create new	May add new subclass
Income statement	Income Tax Expense (Benefit)	YES	NO	NO	YES
Income statement	Interest And Debt Expense	YES	NO	NO	YES
Income statement	Interest And Dividend Income, Operating	NO	NO	NO	YES
Income statement	Interest Expense, Operating	NO	NO	NO	YES
Income statement	Interest Income (Expense) After Provision For Losses	NO	NO	NO	NO
Income statement	Interest Income (Expense) Operating, Net	NO	NO	NO	NO
Income statement	Net Income (Loss)	YES	NO	NO	NO
Income statement	Net Income (Loss) Attributable To Noncontrolling Interest	NO	NO	NO	NO
Income statement	Net Income (Loss) Attributable To Parent	NO	NO	NO	NO
Income statement	Net Income (Loss) Available To Common Stockholders, Basic	NO	NO	NO	NO
Income statement	Noninterest Expense	NO	NO	NO	YES
Income statement	Noninterest Income	NO	NO	NO	YES
Income statement	Nonoperating Income (Expense)	NO	NO	NO	YES
Income statement	Operating Expenses	YES	NO	NO	YES
Income statement	Operating Income (Loss)	NO	NO	NO	NO
Income statement	Other Operating Income (Expenses)	NO	NO	NO	YES
Income statement	Preferred Stock Dividends And Other Adjustments	NO	NO	NO	YES
Income statement	Provision For Loan, Lease, And Other Losses	NO	NO	NO	NO
Income statement	Revenues	YES	NO	NO	YES
Income statement	Revenues, Excluding Interest and Dividends	NO	NO	NO	YES
Income statement	Revenues, Net of Interest Expense	NO	NO	NO	YES

In addition, concepts and classes of concepts are related to other concepts or classes of concepts in specific, identifiable ways. This is not a new idea. This is basic set theory. Further, these ideas are used by other tools used to express relations between things. The following is a summary of these ways:

- **Element-class**: Equivalent to owl:Class, rdfs:Class and rdfs:type. The element A is a defined to be class B. (Example, the taxonomy element us-gaap:Assets (which is an individual) is defined as being the class fro:Assets)
- **Class-subClassOf**: Equivalent to rdfs:subClassOf. Class A is a specializetion of Class P. Ability to organize classes into a hierarchy of general-special terms. Similar to SKOS notion of broader terms versus narrower terms.
- **Class-equivalentClass**: Equivalent to owl:equivalentClass. Class A and class B have the exact same members. (Example, class LiabitiesAndPartnerCapital and the class LiabilitiesAndStockHolderEquity are both equivalent to LiabilitiesAndEquity.)
- **Class-sameAs**: Equivalent to owl:sameAs. Class A and class B are the exact same real world thing. (Example, the class Equity and the class NetAssets are exactly the same thing.)
- **Class-differentFrom**: Equivalent to owl:differentFrom. Class A and class B are the NOT the same real world thing. (Example, the class Assets and the class NetAssets are NOT the same thing.)
- **Class-disjointWith**: Equivalent to owl:disjointWith. Things belonging to one class A cannot also belong to some other class B. (Example, a member of the Person class set of things can never be a member of the Country class set of things.)
- **Class-complementOf**: Equivalent to owl:complementOf. Things that are members of one class A are all the things that do not belong to the other class B (Example, a member of the class of LivingThings set of things is the entire set of things that do not belong to the DeadThings set of things.)
- **Class-inverseOf**: Equivalent to owl:inverseOf. A relationship of type X between A and B implies a relationship of type Y between B and A. (Example, IF starsIn inverseOf hasStar; AND IF MenInBlack hasStar WillSmith; THEN WillSmith starsIn MenInBlack)
- **Class-unionOf**: Equivalent to owl:unionOf. The members of set C include all the members of set A and all the members of set B.
- **Class-intersectionOf**: Equivalent to owl:intersectionOf. The members of set C include all the members of set A that are also members of set B.
- **Whole-hasPart**: Neither OWL nor RDFS has equivalent. The whole A has part B. (Example, the whole BalanceSheet has part Assets.)
- **IsPartOf-whole**: Neither OWL nor RDFS has equivalent. The part A is part of the whole B. (Example, the part Assets is part of the whole BalanceSheet.)

This is both an extremely powerful tool and extremely advanced topic of discussion. What professional accountants need to understand is the notion of classes and relations between classes. Other professionals such as those that develop models or ontologies can help professional accountants express this information in machine readable form. Why? Because the more a machine can understand, the more a machine can do.

24.4.7. Avoid unknowingly changing information representation approach midstream.

Avoid changing from a [Line Items]-based representation approach to a [Member]/[Axis]-based representation approach within a report component. Consistently apply one approach for the entire report component.

For example, a significant number of XBRL-based financial filings represent every balance sheet items using Concepts within a set of [Line Items]. And then the representation approach is changed in order to represent common stock. This change causes an inability to express roll up computations consistently with all other roll up business rules and indicates a flawed representation approach.

This screen shot below shows changing the representation approach used on the balance sheet where Concepts are used to represent balance sheet items and then the creator switches to using [Member]s to express common stock information. This results in a representation which is unnecessarily harder to use, inferior to an approach where items were used consistently to represent all information, and XBRL calculation errors.

Balance Sheet [Line Items]	Period [Axis]					
	2010-12-31			2009-12-31		
	Class of Stock [Axis]			Class of Stock [Axis]		
	Class A Common Stock [Member]	Class B Common Stock [Member]	Class of Stock [Domain]	Class A Common Stock [Member]	Class B Common Stock [Member]	Class of Stock [Domain]
ASSETS [Roll Up]						
CURRENT ASSETS [Roll Up]						
Cash and cash equivalents			11,000,000			10,000,000
Restricted cash			1,000,000			1,000,000
Short term investments			1,000,000			2,000,000
Accounts receivable, net of allowance for doubtful accounts of $1,000 and $1,000			29,000,000			29,000,000
Inventories			4,000,000			4,000,000
Prepaid expenses			8,000,000			8,000,000
Other current assets			2,000,000			2,000,000
Total current assets			56,000,000			56,000,000
NONCURRENT ASSETS [Roll Up]						
Property, plant and equipment, net			9,000,000			9,000,000
Other noncurrent assets			82,000,000 [1]			82,000,000
Total noncurrent assets			91,000,000			91,000,000
Total assets			147,000,000			147,000,000
LIABILITIES AND EQUITY [Roll Up]						
LIABILITIES [Roll Up]						
CURRENT LIABILITIES [Roll Up]						
Accounts payable and accrued expenses			7,000,000			7,000,000
Current potion of long-term debt			22,000,000			22,000,000
Other current liabilities			26,000,000			26,000,000
Total current liabilities			55,000,000			55,000,000
NONCURRENT LIABILITIES [Roll Up]						
Accounts payable and accrued expenses			1,000,000			1,000,000
Long-term debt			19,000,000			19,000,000
Other noncurrent liabilities			32,000,000 [1]			33,000,000
Total noncurrent liabilities			52,000,000			53,000,000
Total liabilities			107,000,000			108,000,000
Commitments and contingencies						
STOCKHOLDERS' EQUITY [Roll Up]						
Preferred stock, Class A, $1 par, 10,000 shares authorized, issued and outstanding; redemption abount $5,000, liquidation preference $10,000, conversion basis Tincidunt cursus est			10,000,000			10,000,000
Common stock, Class A and Class B, $1 par, 110,000 shares authorized (Class A 60,000, Class B 50,000), 90,000 shares issued and outstanding (Class A 50,000, Class B 40,000)	10,000,000	10,000,000		10,000,000	10,000,000	
Additional paid in capital			1,000,000			1,000,000
Treasury stock, share value $1, 10,000 shares, restrictions are Cursus est ullamcorper vel sollicitudin lacus			2,000,000			2,000,000
Retained earnings			6,000,000			6,000,000
Accumulated other comprehensive income, net of tax			5,000,000			4,000,000
Stockholders' equity			40,000,000			39,000,000
Total liabilities and stockholders' equity			147,000,000			147,000,000

24.4.8. Avoid inconsistencies in network identification.

When a report component is represented, the XBRL presentation relations, XBRL calculation relations, and XBRL definition relations related to that report component should have the same network naming (i.e. identifier, number, sort category, and title). There is no reason to name report component pieces with differently/inconsistently (i.e. using different networks).

Saying this another way; if you use the network identifier *http://www.myCompany.com/role/BalanceSheet* on the presentation relations, *http://www.myCompany.com/role/BalanceSheet2* on the calculation relations, and *http://www.myCompany.com/role/BalanceSheet3* on the definition relations; software will not understand that those pieces go together and work together because it has no way of understanding that they go together. Whereas if the presentation relations, calculation relations, and definition relations all use the same network identifier *http://www.myCompany.com/role/BalanceSheet* software will understand that the pieces go together.

Bottom line: use the same network identifier and network name for all relations expressed and business rules expressed for a report component.

24.4.9. Recognize that characteristics apply to all reported facts within a report component.

Recognize that a characteristic expressed via an [Axis] within a report component applies to every concept within that report component. And so if a "Class of Stock [Axis]" exists on a balance sheet, you are saying that "Cash and Cash Equivalents", "Inventories", and all the other balance sheet items have a characteristic related to a class of stock.

Avoid doing this: http://www.sec.gov/Archives/edgar/data/1487685/000138713112000988/0001387131-12-000988-index.htm

Statement [Line Items]	Period [Axis]													
	2011-12-31							2010-12-31						
	Class of Stock [Axis]							Class of Stock [Axis]						
	Series A-1 Preferred Stock	Series A-2 Preferred Stock	Series A-1 Preferred Warrant	Series A-2 Preferred Warrant	Series A-1 Common Stock	Series A-2 Common Stock	Class of Stock [Domain]	Series A-1 Preferred Stock	Series A-2 Preferred Stock	Series A-1 Preferred Warrant	Series A-2 Preferred Warrant	Series A-1 Common Stock	Series A-2 Common Stock	Class of Stock [Domain]
Allowance for doubtful accounts - accounts receivable gaming							282,000							1,931,000
Allowance for doubtful accounts - accounts receivable other							101,000							151,000
Accumulated amortizations - financing fees							5,086,000							1,680,000
Accumulated amortizations - rated player relationships							20,700,000							6,900,000
Preferred stock par value	0.01	0.01						0.01	0.01					
Preferred stock shares authorized	1,688,268	645,065						1,688,268	645,065					
Preferred stock shares issued	1,463,535	162,255						1,463,535	162,255					
Preferred stock shares outstanding	1,463,535	162,255						1,463,535	162,255					
Preferred warrants par value			0.01	0.01						0.01	0.01			
Preferred warrants shares issued			202,511	460,587						202,511	460,587			
Preferred warrants shares outstanding			202,511	460,587						202,511	460,587			
Common stock par value					0.01	0.01						0.01	0.01	
Common stock shares authorized					4,354,935	645,065						4,354,935	645,065	
Common stock shares issued					142,423	xsi:nil						140,291	xsi:nil	
Common stock shares outstanding					142,423	xsi:nil						140,291	xsi:nil	

There are two things inappropriate about the above example. First, three discrete pieces are all run together which makes the information harder to read. Second, information about the allowance for doubtful accounts has a "Class of Stock [Axis]" and is associated with the "Class of Stock [Domain]" which makes no sense. A good clue that this representation is a mistake is all the empty cells that you see. Notice the four distinct groups of information for each period. Those groups are things which do go together.

Better practice is this: http://goo.gl/4Q0cQh

Balance Sheet Parenthetical [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Balance Sheet Parenthetical [Hierarchy]		
Accounts receivable, allowance	7,000,000	6,000,000

Preferred Stock Information, by Class [Line Items]	Period [Axis]					
	2010-12-31			2009-12-31		
	Class of Stock [Axis]			Class of Stock [Axis]		
	Class A Preferred Stock [Member]	Class B Preferred Stock [Member]	Class of Stock [Domain]	Class A Preferred Stock [Member]	Class B Preferred Stock [Member]	Class of Stock [Domain]
Class of Preferred Stock [Hierarchy]						
Preferred stock, par value per share	1	1		1	1	
Preferred stock, shares authorized	20,000	20,000		20,000	20,000	
Preferred stock, shares issued	20,000	20,000		20,000	20,000	
Preferred stock, shares outstanding	20,000	20,000		20,000	20,000	
Preferred stock, value outstanding	10,000,000	10,000,000	20,000,000	10,000,000	10,000,000	20,000,000

Common Stock Information, by Class [Line Items]	Period [Axis]					
	2010-12-31			2009-12-31		
	Class of Stock [Axis]			Class of Stock [Axis]		
	Class A Common Stock [Member]	Class B Common Stock [Member]	Class of Stock [Domain]	Class A Common Stock [Member]	Class B Common Stock [Member]	Class of Stock [Domain]
Class of Common Stock [Hierarchy]						
Common stock, par value per share	1	1		1	1	
Common stock, shares authorized	60,000	50,000		60,000	50,000	
Common stock, shares issued	50,000	40,000		50,000	40,000	
Common stock, shares outstanding	50,000	40,000		50,000	40,000	
Common stock, value outstanding	10,000,000	10,000,000	20,000,000	10,000,000	10,000,000	20,000,000

Notice how if the accounts receivables allowance, the preferred stock information, and the common stock information are separated it makes all the information easier to read each of those representations. There are not a lot of empty cells.

24.4.10. Recognize that rendering engines render presentation differently but the meaning is the same across all rendering engines.

Rendering engines render information from a digital financial report differently, however the meaning of the information is the same across all rendering engines. Why? The meaning of the information is specified within the XBRL technical specification and is not open to interpretation to the extent that that meaning is specified.

Why should you care about this? Well, SEC filers should be less concerned about how their information is presented within the SEC interactive data viewer because that is not how most people will be using that information. If investors and analyst want to read the information they will use the HTML version of the report. Information will most likely be used in iPhone applications, iPad applications, analysis tools, Excel or other digital representation. That information will generally come from web service APIs. Information will then be rendered by individual applications in many, many different ways.

This is why the representation of the information is more critical to watch over than the presentation of the information.

Also, the SEC interactive data viewer is not a very good rendering engine. It does not make a lot of information available. For example, you cannot see roll up computations.

Consider the rendering below which shows calculations by cleverly putting a green check in the lower right hand corner of each roll up to show if the roll up is valid or invalid. (This rendering is provided by SECXBRL.info.)

Component: (Network and Table)	
Network	1001000 - Statement - CONDENSED CONSOLIDATED STATEMENTS OF INCOME (http://www.thecocacolacompany.com/role/CondensedConsolidatedStatementsOfIncome)
Table	Statement [Table]
Reporting Entity	http://www.sec.gov/CIK 0000021344
Statement, Scenario [Axis]	Scenario, Unspecified [Domain]

Statement	Period [Axis]			
	2014-06-28/2014-09-26	2014-01-01/2014-09-26	2013-06-29/2013-09-27	2013-01-01/2013-09-27
NET OPERATING REVENUES	11,976,000,000	35,126,000,000	12,030,000,000	35,814,000,000
Cost of goods sold	4,630,000,000	13,532,000,000	4,793,000,000	14,106,000,000
GROSS PROFIT	7,346,000,000	21,594,000,000	7,237,000,000	21,708,000,000
Selling, general and administrative expenses	4,507,000,000	12,880,000,000	4,424,000,000	12,991,000,000
Other operating charges	128,000,000	457,000,000	341,000,000	594,000,000
OPERATING INCOME	2,711,000,000	8,257,000,000	2,472,000,000	8,123,000,000
Interest income	169,000,000	436,000,000	136,000,000	381,000,000
Interest expense	113,000,000	344,000,000	90,000,000	314,000,000
Equity income (loss) - net	205,000,000	530,000,000	204,000,000	537,000,000
Other income (loss) - net	-312,000,000	-630,000,000	658,000,000	522,000,000
INCOME BEFORE INCOME TAXES	2,660,000,000	8,249,000,000	3,380,000,000	9,249,000,000
Income taxes	538,000,000	1,896,000,000	925,000,000	2,331,000,000
CONSOLIDATED NET INCOME	2,122,000,000	6,353,000,000	2,455,000,000	6,918,000,000
Less: Net income attributable to noncontrolling interests	8,000,000	25,000,000	8,000,000	44,000,000
NET INCOME ATTRIBUTABLE TO SHAREOWNERS OF THE COCA-COLA COMPANY	2,114,000,000	6,328,000,000	2,447,000,000	6,874,000,000
BASIC NET INCOME PER SHARE (in dollars per share)	0.48	1.44	0.55	1.55
DILUTED NET INCOME PER SHARE (in dollars per share)	0.48	1.42	0.54	1.52
DIVIDENDS PER SHARE (in dollars per share)	0.305	0.915	0.280	0.840
AVERAGE SHARES OUTSTANDING (in shares)	4,383,000,000	4,392,000,000	4,426,000,000	4,442,000,000
Effect of dilutive securities (in shares)	62,000,000	62,000,000	72,000,000	76,000,000
AVERAGE SHARES OUTSTANDING ASSUMING DILUTION (in shares)	4,445,000,000	4,454,000,000	4,498,000,000	4,518,000,000

24.4.11. Recognize that the number of members in reported set does not change the characteristics of a reported fact.

When information is represented, the number of [Member]s of a characteristic does not change the representation approach. Whether that set of [Member]s has 5 members, or 3, or only 1; the representation approach does not change.

For example, characteristic information which describes classes of common stock does not change if there is one, two, three, or many other classes of stock. The number of [Member]s may change; but the characteristics of the class of stock information does not change.

Avoid doing this: http://goo.gl/T2bisK

Common Stock Information, by Class [Line Items]	Period [Axis]	
	2010-12-31	2009-12-31
Class of Common Stock [Hierarchy]		
Common stock, par value per share	1	1
Common stock, shares authorized	60,000	60,000
Common stock, shares issued	50,000	50,000
Common stock, shares outstanding	50,000	50,000
Common stock, value outstanding	10,000,000	10,000,000

Note that there is no "Class of Stock [Axis]" and therefore no "Class A Common Stock [Member]" to explicitly identify.

Better practice is this (even with only one member): http://goo.gl/qhRzF7

Common Stock Information, by Class [Line Items]	Period [Axis]			
	2010-12-31		2009-12-31	
	Class of Stock [Axis]		Class of Stock [Axis]	
	Class A Common Stock [Member]	Class of Stock [Domain]	Class A Common Stock [Member]	Class of Stock [Domain]
Class of Common Stock [Hierarchy]				
Common stock, par value per share	1		1	
Common stock, shares authorized	60,000		60,000	
Common stock, shares issued	50,000		50,000	
Common stock, shares outstanding	50,000		50,000	
Common stock, value outstanding	10,000,000	10,000,000	10,000,000	10,000,000

Notice how in the rendering above that (a) there is one class of stock, (b) that information is explicit and not implied, (c) there is a total for ALL classes of stock which so happens to be the same as the one class because there is only one class of stock.

Contrast the above to this (when you have two members this is the proper representation; why would you not provide the [Axis] if there is only one [Member]?

See: http://goo.gl/po3UtR

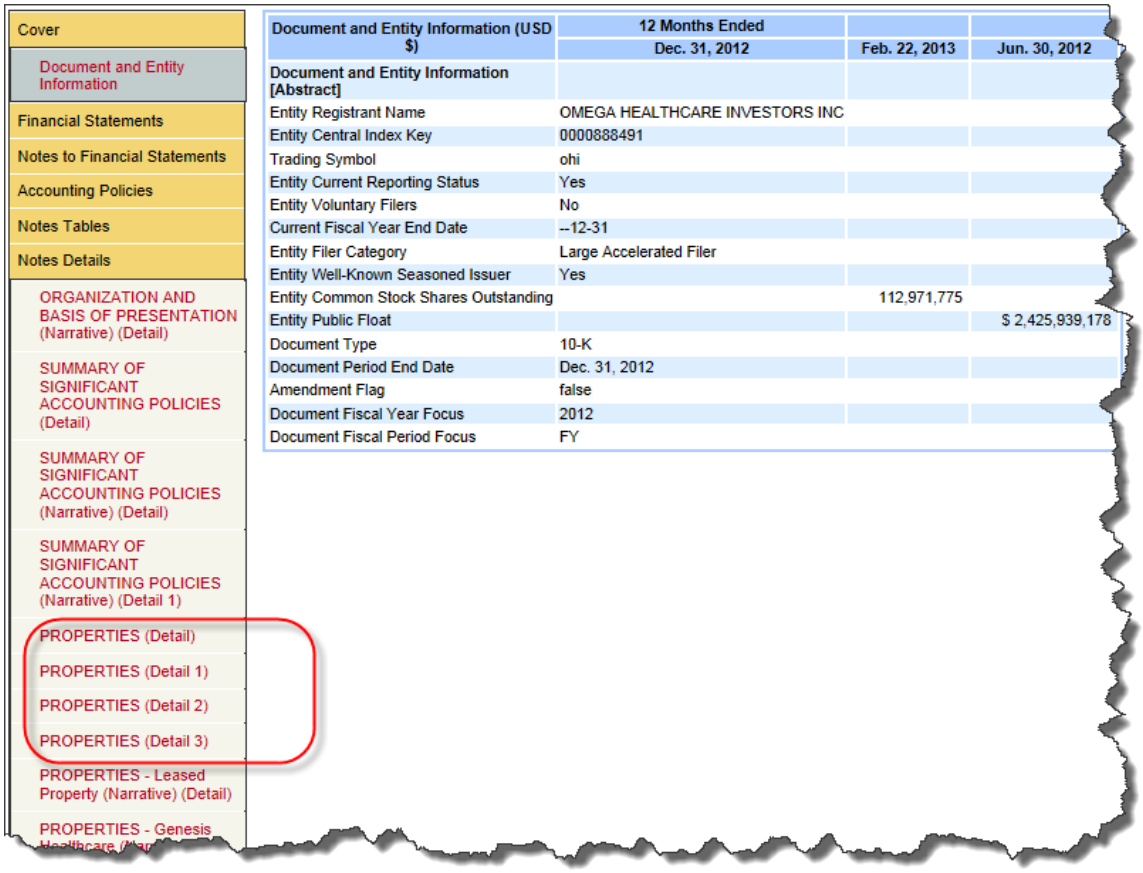
Common Stock Information, by Class [Line Items]	Period [Axis]					
	2010-12-31			2009-12-31		
	Class of Stock [Axis]			Class of Stock [Axis]		
	Class A Common Stock [Member]	Class B Common Stock [Member]	Class of Stock [Domain]	Class A Common Stock [Member]	Class B Common Stock [Member]	Class of Stock [Domain]
Class of Common Stock [Hierarchy]						
Common stock, par value per share	1	1		1	1	
Common stock, shares authorized	60,000	50,000		60,000	50,000	
Common stock, shares issued	50,000	40,000		50,000	40,000	
Common stock, shares outstanding	50,000	40,000		50,000	40,000	
Common stock, value outstanding	10,000,000	10,000,000	20,000,000	10,000,000	10,000,000	20,000,000

Now a second class of stock is added. Compare this with both the "Avoid doing this" and the "Better practice is this" examples and you begin to see why the better practice is better. Further, if you look at the XBRL Formulas which support the representation, the formula does not change at all between 1 class of stock, 2 classes, and would not change if there were 50 classes of stock. That is additional evidence that this is a better representation approach.

24.4.12. Label networks with meaningful information.

When describing what is contained in your digital financial report, avoid terms which don't allow a user of the information to understand what that section of the report contains. For example, avoid the use of "Detail", "Detail 1", "Detail 2", "Detail 3" as is shown below:

http://www.sec.gov/cgi-bin/viewer?action=view&cik=888491&accession_number=0001188112-13-000515&xbrl_type=v#



Document and Entity Information (USD $)	12 Months Ended		
	Dec. 31, 2012	Feb. 22, 2013	Jun. 30, 2012
Document and Entity Information [Abstract]			
Entity Registrant Name	OMEGA HEALTHCARE INVESTORS INC		
Entity Central Index Key	0000888491		
Trading Symbol	ohi		
Entity Current Reporting Status	Yes		
Entity Voluntary Filers	No		
Current Fiscal Year End Date	--12-31		
Entity Filer Category	Large Accelerated Filer		
Entity Well-Known Seasoned Issuer	Yes		
Entity Common Stock Shares Outstanding		112,971,775	
Entity Public Float			$ 2,425,939,178
Document Type	10-K		
Document Period End Date	Dec. 31, 2012		
Amendment Flag	false		
Document Fiscal Year Focus	2012		
Document Fiscal Period Focus	FY		

Rather, use descriptive titles which accurately describe information contained in that section and help the user of the information understand what the section contains.

24.4.13. Understand that every financial report has one report frame or report pallet.

A report frame[228] is simply the notion that every financial report has a high-level pattern. If you recognize what that pattern is, report frame patterns can be leveraged.

The financial reports of reporting entities can be grouped into high level patterns of variability[229]. Comprehensive testing of all XBRL-based financial filings at this very high level revealed a very limited amount of variability most of which occurs on the income statement. This variability is not random. The following is a summary of and a complete inventory of this variability at this high-level of a financial report:

- Entities report using some accounting industry or activity
  - Commercial and industrial (standard approach)
  - Interest based revenues
  - Insurance based revenues
  - Securities based revenues
  - REIT (real estate investment trust)
  - Utility
- Balance sheets can be
  - Classified and report current and noncurrent assets and liabilities
  - Unclassified
  - Report using liquidity based reporting
- Income statements can be
  - Multi-step and report gross profit
  - Single-step and do not report gross profit
- Income statements can
  - Report operating income (loss)
  - Do not report operating income (loss)
- Income (loss) from equity method investments can be reported on the income statement
  - As part of revenues
  - As part of nonoperating income (loss)
  - Before taxes as a separate line item
  - After taxes as a separate line item
  - Between income (loss) from continuing operations before and after taxes
- Cash flow statements can report net cash flow as

[228] See, http://www.xbrlsite.com/2014/Prototype/ReportFrames/ReportFrames.html
[229] For a detailed analysis of how report frames were derived, please see this resource, http://www.xbrlsite.com/2014/Library/SummaryInformationAboutConformanceWithFundamentalAccountingConceptRelations.pdf

  - Including exchange gains (losses)
  - Not including exchange gains (losses)

This is a comprehensive and complete inventory of the high level variability in public company financial filings. This information is not a statistical analysis or speculation. This is observable empirical evidence provided by the XBRL-based public company financial filings submitted to the SEC.

A coding scheme was developed to articulate this information in both human readable and machine readable form. Below is a brief description of that coding scheme. Each code has six parts: "COMID-BSC-CF1-ISS-IEMIB-OILY". This explains each part and the codes used for each part and shows the number of entities which have that characteristic (note that the totals add up to 6,943 and not 6,947; this relates to an issue with CIK numbers):

- **Part 1: Industry codes: (Total 6,943)**
  - COMID=Commercial and Industrial (5,985)
  - INTBX=Interest based revenues (632)
  - INSBX=Insurance based revenues (50)
  - SECBX=Securities based revenues (93)
  - REITX=Real estate investment trust (158)
  - UTILX=Utility (25)
- **Part 2: Balance sheet form codes: (Total 6,943)**
  - BSC=Classified balance sheet (5,527)
  - BSU=Unclassified balance sheet (1,412)
  - BSL=Liquidity based balance sheet (4)
- **Part 3: Cash flow statement exchange gains codes: (Total 6,943)**
  - CF1=Exchange gains (losses) part of net cash flow or does not report line item (6,845)
  - CF2=Exchange gains (losses) part of cash roll forward (98)
- **Part 4: Income statement form codes: (Total 6,943)**
  - ISS=Single step income statement (4,255)
  - ISM=Multi step income statement (2,688)
- **Part 5: Income (loss) from equity method investments location codes: (Total 6,943)**
  - IEMIX=Income (loss) from equity method investments not reported (5,290)
  - IEMIB=Income (loss) from equity method investments reported BEFORE tax (1,402)
  - IEBIA=Income (loss) from equity method investments reported AFTER tax (113)

  - IEMIN=Income (loss) from equity method investments reported within nonoperating income (loss) (122)
  - IEMIR=Income (loss) from equity method investments reported within revenues (16)
  - IEMIT=Income (loss) from equity method investments reported between income (loss) from continuing operations before and after taxes (0, not working yet)
- **Part 6: Operating income (loss) codes: (Total 6,943)**
  - OILY=Operating income (loss) reported (5,120)
  - OILN=Operating income (loss) not reported (1,823)

While the complete set of codes and report frames cannot be known until the process of breaking public company filings into these sets and testing each filing and set as to their conformance to the fundamental accounting concepts and relations within the set and the success of this process is verified by 100% conformance by each reporting entity to 100% of the fundamental accounting concepts and relations between those concepts within each set; this is achievable.

In fact, testing shows that this objective has already been achieved for 98.7% of relations and 60.0% of all public company financial reports submitted to the SEC using the XBRL format. Further, which reporting entities do not conform to these concepts and relations and why they do not conform is easy to observe.

Another possibility which exists in order to manage this process is simply to remove sets of reporting entities from scope. For example, I have already removed entities which are funds and trusts from scope because I personally have no interest in such entities. Also, there are five entities which I classify as "hybrids" because they report using significantly more complex reporting schemes. Basically, certain report frames can be simply removed from scope.

25. APPENDIX: Financial Report Semantic Object Properties

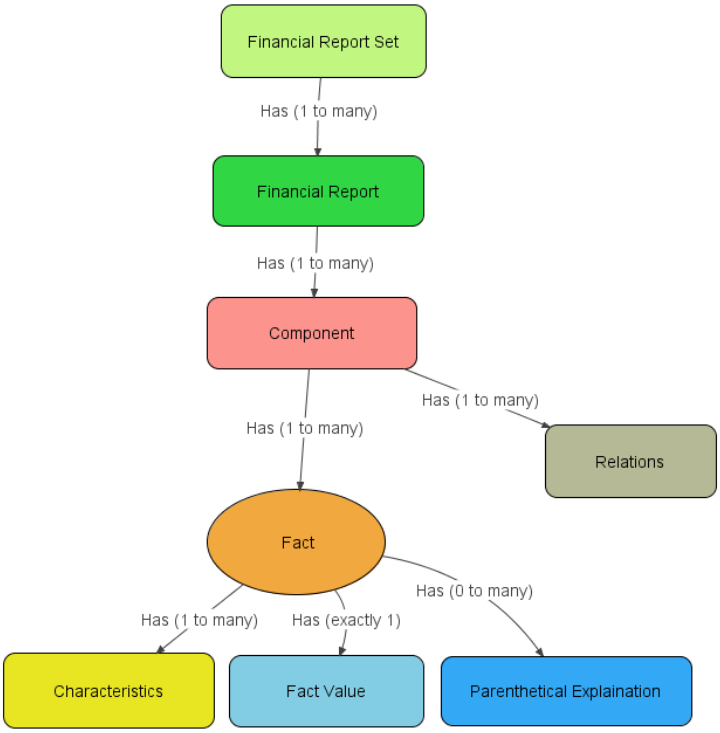
This section provides the properties of report elements. See the section on the logical model report elements for a summary overview.

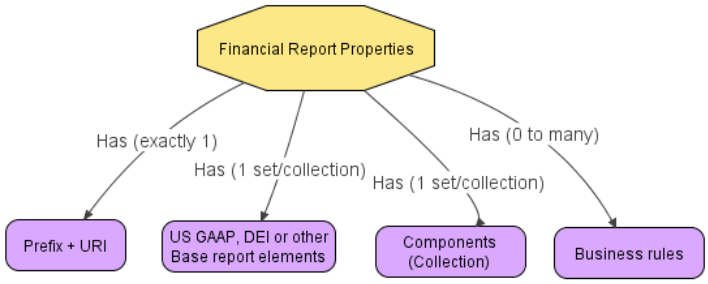
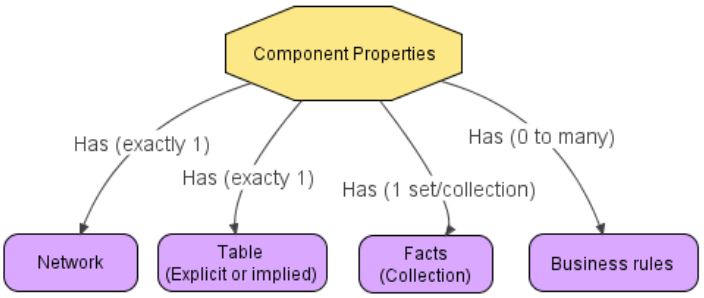
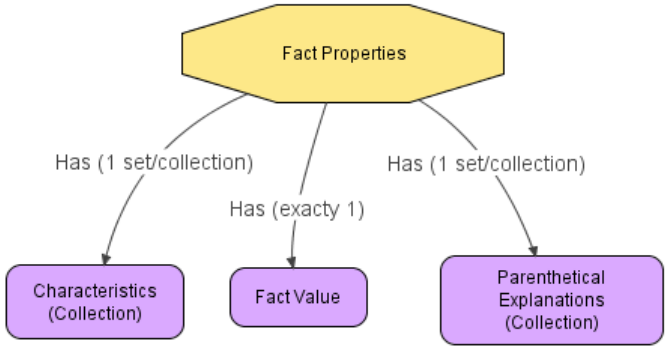
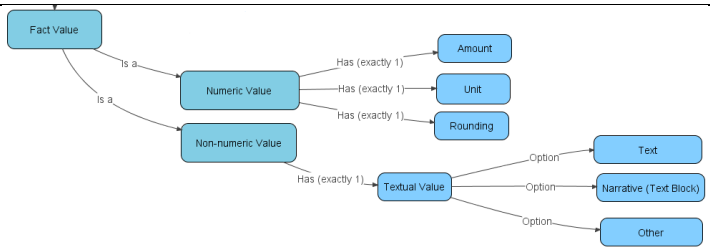
25.1. Reconciliation of financial report semantics terminology to XBRL Abstract Model 2.0 terminology:

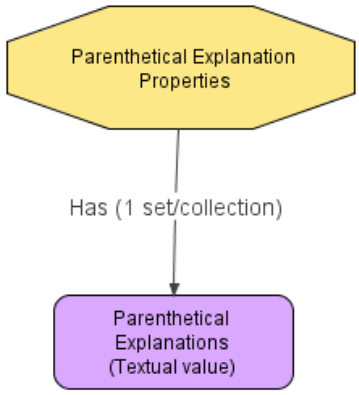
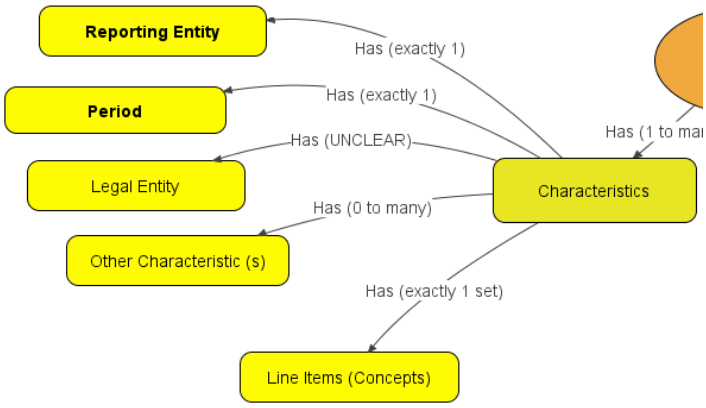
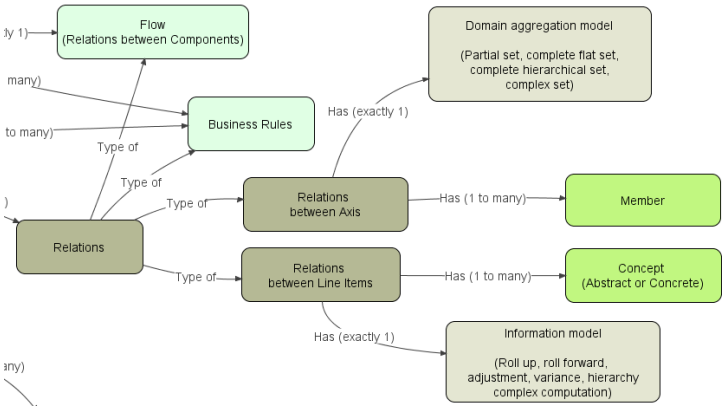
Example	**Financial Report Semantics and Dynamics Theory Object**	**XBRL Abstract Model 2.0 Object**
Financial statement portion of a 10-Q or 10-K; financial statement issued by a private entity	**Financial report** – A financial statement plus supplementary financial information. Financial report can be broken down into components.	Document or Manifest
See the examples from each rudimentary or primitive piece above	**Financial report rudiments** – One of the primitive building blocks or objects of a financial report: financial report, component, characteristic, fact, parenthetical explanation, relation	Model Element
Balance sheet, significant accounting policies, maturities of long-term debt	**Component** – A portion of a financial report. Made up of facts which go together for some specific purpose and the relations between facts and relations between characteristics.	Cube, Cube Region
Reporting entity with CIK number 1234567890; Legal entity of "consolidated entity"; Period of "2011-21-31"; Property, plant and equipment class of "Land"	**Characteristic** – Describes a fact. Made up of a characteristic and the value of that characteristic.	Aspect
Assets = Liabilities + Equity; Beginning cash + net cash flows = ending cash	**Relation** – The relation from one object of a financial report to another object or objects.	Relation
Value of 1000 for the concept "Cash and cash equivalents" for the legal entity "consolidated entity" for the period ended "December 31, 2010" expressed in US Dollars rounded to millions	**Fact** – A single, observable, reported piece of information. Connection of characteristics, a value, traits of the value if numeric, and parenthetical information	Data Point
Parenthetical explanation on the bottom of a page, a footnote to a financial fact	**Parenthetical explanation** – provide additional descriptive information about a fact.	Footnote
Roll up, roll forward, hierarchy	Relation between concepts within the concept characteristic	Relation
North America, United States, Canada	Relations between values of a characteristic	Relation
Balance sheet, then income statement, then statement of changes in equity, …	Relationship between components or the order or sequence of components	Relation
Units, rounding, balance type, period type	**Property** – Property or trait of an object.	Attribute

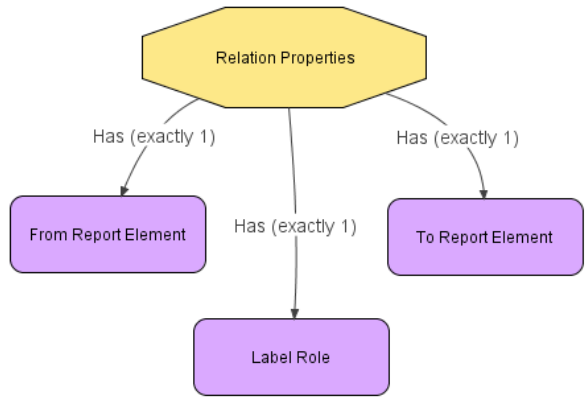
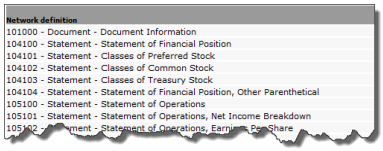
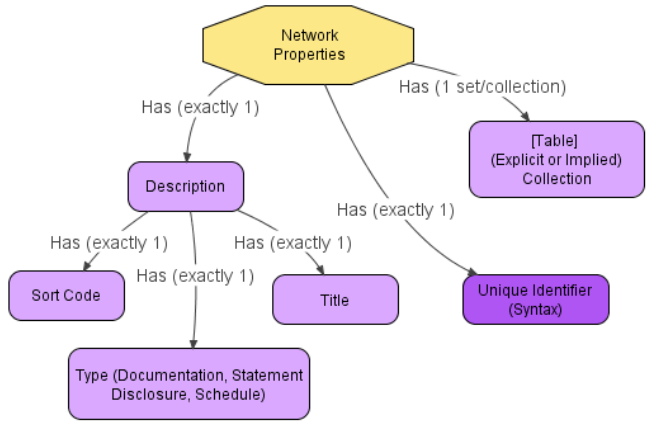
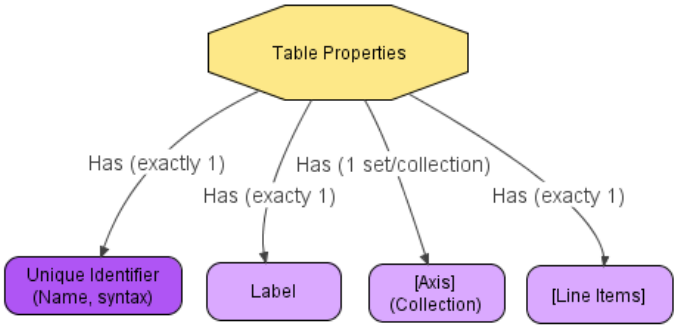
25.2. Semantic objects and their properties

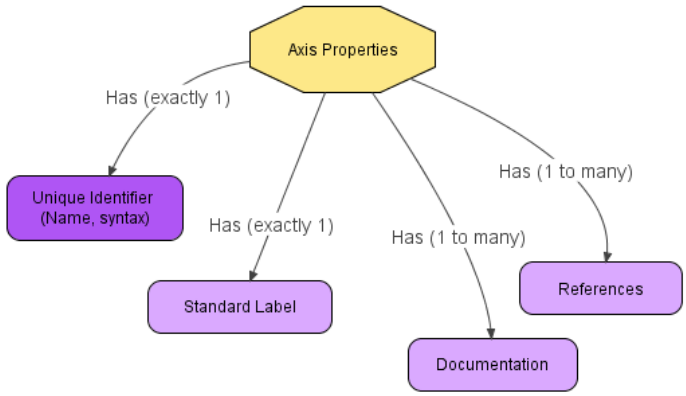
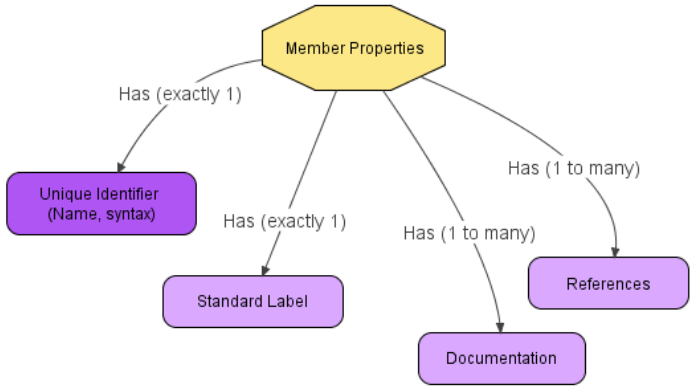
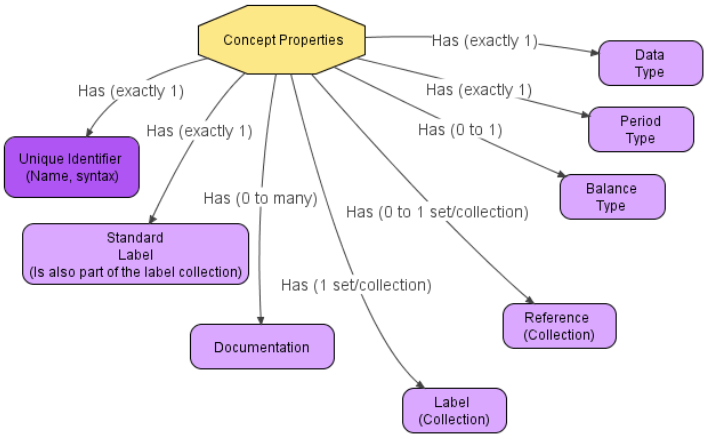
This section provides a more complete detailed explanation of the semantic objects of a financial report, including an SEC XBRL financial filing, the relations of those semantic objects, and the properties of those objects and relations. For a complete diagram of these semantics see the PDF here.)

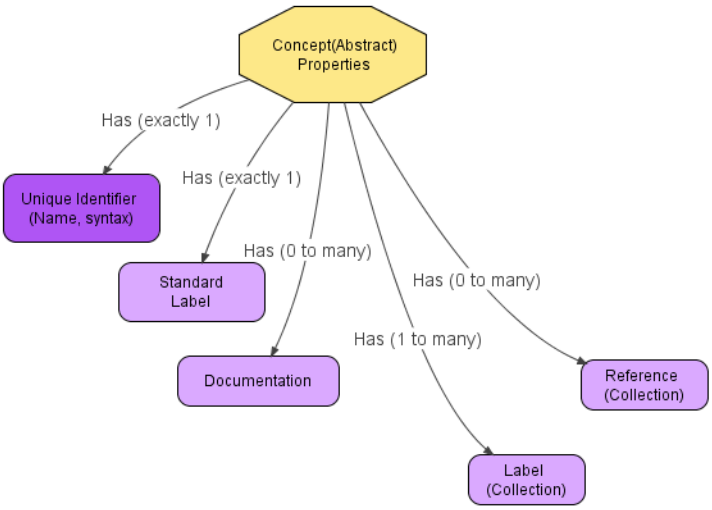
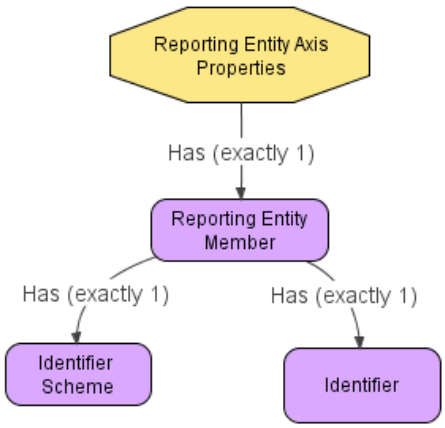
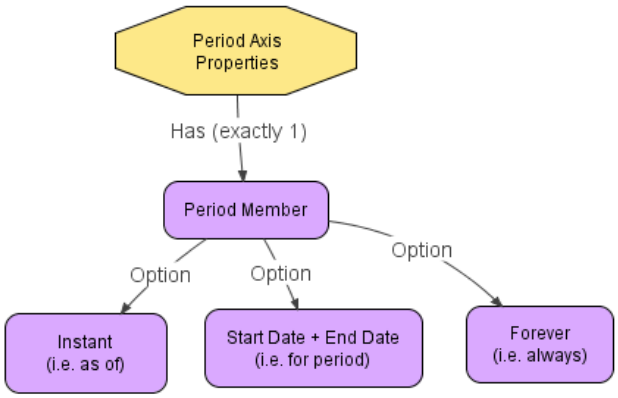
Semantic Object / Discussion	Graphical representation
Overview of semantic objects: These are the fundamental or primitive building blocks of any financial report, no matter what the format (paper, HTML, PDF, Word, XBRL). A **financial report set** has 1 or more financial reports. For example, when you compare the financial information of one reporting entity to the financial information of one or more other reporting entities; the financial report set is that complete set of financial reports being compared. A **financial report** communicates facts. A **component** is a set of facts which goes together for some specific purpose. A **fact** is a single, observable, reportable piece of information. Facts have characteristics, a value, and they may have **parenthetical explanations** which further describe a fact. **Characteristics** describe facts. Facts and characteristics organized within a component can have **relations**.	

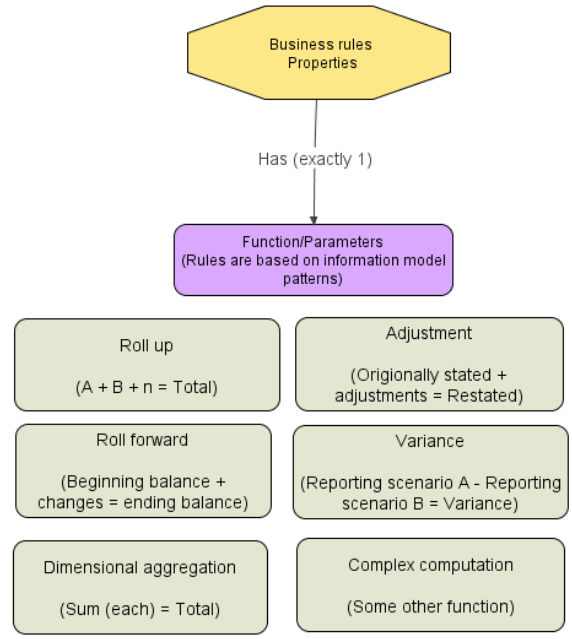
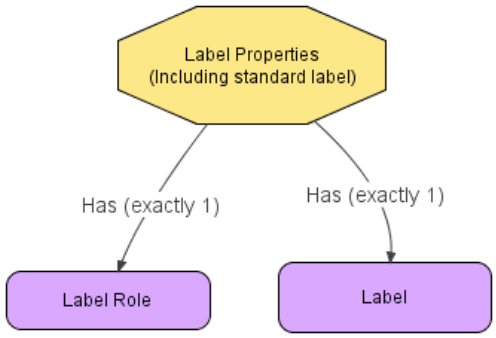
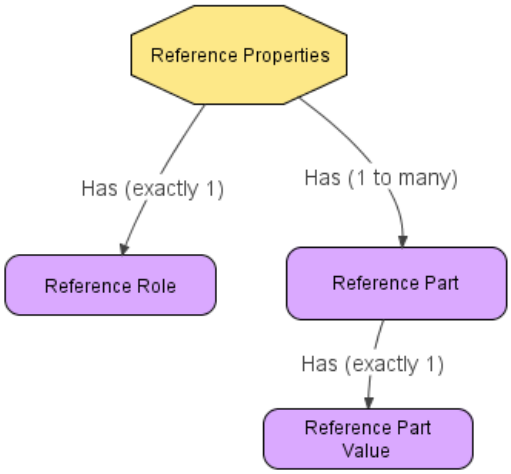
Semantic Object / Discussion	**Graphical representation**
Financial Report: Financial reports communicate facts. A financial report is implemented as an XBRL instance and supporting XBRL taxonomies. The distinction between instance and taxonomy is a nature of XBRL, not a nature of a financial report.	
Component: A component is a set of facts which go together for some specific purpose (defined by Financial Report Semantics and Dynamics Theory). A component is implemented as a network/table. Neither the US GAAP Taxonomy architecture nor the SEC defines precisely what a "network" or "table" is semantically. This is a notion rather than a physical thing.	
Fact: A fact defines a single, observable, reportable piece of information contained within a financial report, or fact value, contextualized for unambiguous interpretation or analysis by one or more characteristics. Numeric fact values must also provide the additional traits "units" and "rounding" to enable appropriate interpretation of the numeric fact value. Facts may have zero or many parenthetical explanations which provide additional descriptive information related to the fact. Facts are implemented as XBRL simple facts. Compound facts (i.e. tuples) are not allowed per the US GAAP Taxonomy Architecture.	
Fact Value: Facts have a value.	

Semantic Object / Discussion	Graphical representation
Parenthetical explanations: Financial facts have parenthetical explanations which provide additional descriptive information about the fact. Parenthetical explanations are implemented as XBRL footnotes.	
Characteristics: Facts have characteristics. Characteristics describe facts. Characteristics are implemented using several different technical syntax in XBRL; as axes (i.e. set of [Axis]), [Member]s, [Line Items]; reporting entity and period are part of the XBRL instance context element technical syntax, but these are clearly axis.	
Relations: Characteristics of a financial fact may be related. Facts may be related. Components may be related. Flow is the relationship between components. Member aggregation model (or domain aggregation model) is the relations between members of a domain for an [Axis]. Information model is the relation between concepts within a set of [Line Items]. Business rules are relations between facts and characteristics.	

Semantic Object / Discussion	Graphical representation
Relations: Relations have properties. A relation is between two report elements. A relation has a role.	
Network: Semantics of a network are undefined. Networks are implemented as XBRL networks.  Network definition 101000 - Document - Document Information 104100 - Statement - Statement of Financial Position 104101 - Statement - Classes of Preferred Stock 104102 - Statement - Classes of Common Stock 104103 - Statement - Classes of Treasury Stock 104104 - Statement - Statement of Financial Position, Other Parenthetical 105100 - Statement - Statement of Operations 105101 - Statement - Statement of Operations, Net Income Breakdown	
Table: Semantics of a table are undefined. *HINT*: While the semantics of a [Table] are clearly defined from a report logical model perspective, they are undefined from a domain perspective. Tables are implemented either explicitly as a [Table] or XBRL Dimensions hypercube or implicitly (i.e. if concepts are not associated with a hypercube) as the relations within a network. Said another way, the reporting entity characteristic and period characteristic are required, XBRL Dimensions can be used to create additional characteristics.	

Semantic Object / Discussion	**Graphical representation**
Axis: An [Axis] is used to articulate a characteristic. An [Axis] is abstract and therefore can never contain a value. Therefore the data type, period type, and balance have no semantic meaning. SEC EFM requires specific values for these attributes. There are multiple ways characteristics are implemented: as an [Axis], as a context entity identifier, and as a context period.	
Member: A [Member] is a possible value of an [Axis]; together they are used to articulate a characteristic. A [Member] is abstract and therefore can never contain a value. Therefore the data type, period type, and balance have no semantic meaning. SEC EFM requires specific values for these attributes.	
Concepts: Concepts describe facts in such a way that they can contain values. As such, concepts therefore have a data type, period type, balance type are important. Concepts are implemented as (a) XBRL Dimensions primary items if they participate in a hypercube or if they do not participate in a hypercube (b) XBRL concepts. *HINT*: It is recommended that all concepts be implemented as XBRL Dimensions primary items, mixing the two can cause problems.	

Semantic Object / Discussion	**Graphical representation**
Abstract: [Line Items] which are abstract can never contain a value. Therefore the data type, period type, and balance have no semantic meaning. SEC EFM requires specific values for these attributes. *HINT*: Abstract report elements are implemented similar to concepts, but have an attribute "abstract" whose value is "true". Note that the term "abstract" is not being used here to mean the value of the XML Schema abstract attribute. *NOTE*: Documentation is optional for abstract concepts. *HINT*: It is recommended that all concepts be implemented as XBRL Dimensions primary items, mixing the two can cause problems.	
Reporting Entity is a type of [Axis], just implemented as a different technical syntax.	
Period is a type of [Axis], just implemented using a different technical syntax.	

Semantic Object / Discussion	Graphical representation
Business rules: A business rule is a type of relation.	
Label: The lang="en-US" is required, therefore it never needs to be entered by the user.	
References: Users will never add references in their filer extension taxonomies; they are not allowed to by the SEC. References are only used by the base taxonomies. As such, the references themselves don't need to be reviewed; but they are used to review concepts which possess references.	

26. APPENDIX: Report Element Properties

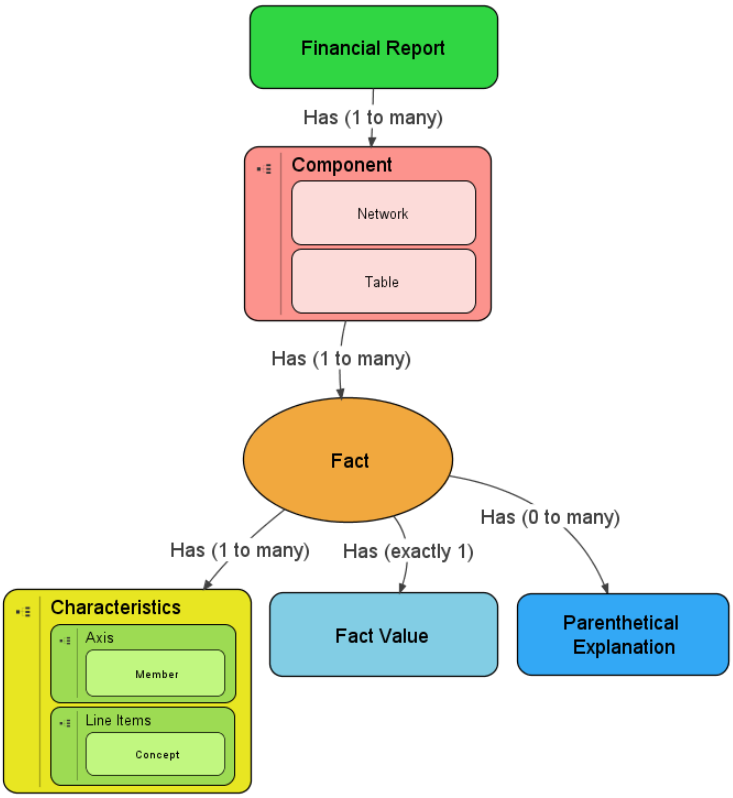
This section provides the properties of report elements used within the financial report implementation model.

26.1. Implementation model terminology summary

A report element or model element is a piece of a digital financial report. Report elements or model elements can be grouped into categories. These categories are summarised below:

- Financial Report
- Network
- Table
- Axis
- Member
- Line Items
- Concept
- Fact

The following graphic shows the relations between report element categories:



26.2. Reconciliation of implementation model terminology to financial report semantic terminology

The following is a reconciliation of implementation model terminology to financial report semantics terminology defined by the *Financial Report Semantics and Dynamics Theory*. Also provided is a column for the XBRL technical syntax of how the report element is implemented.

Implementation Model Term (US GAAP Taxonomy Architecture /SEC Model Term)	XBRL Technical Syntax Term	Financial Report Semantics and Dynamics Theory Term	*Example*
Report element or **Model element**	XML Schema element with specific attributes; different sets of attributes and attribute values define report elements to be different things	Financial report rudiments	*Network, Table, Axis, Member, Line Items, Concept, Fact*
Network (must have a unique URI, must have a number, must have a sort group, must have a title)	Network expressed using the XLink extended link with an XBRL extended link role	This is *part of a component*, but because different taxonomies use network, hypercube, or combinations of network/hypercube; this cannot be mapped to one physical technical syntax	*Balance sheet*
[Table] (period must be "duration", must not have a balance attribute, must be abstract)	XML schema element with the substitutionGroup value of "xbrldt:hypercubeItem"	This is *part of a component*, but because different taxonomies use network, hypercube, or combinations of network/hypercube; this cannot be mapped to one physical technical syntax	*Balance sheet*
[Axis] (must have a type of "nonnum:domainMemberItem", period must be "duration", must not have a balance attribute, must be abstract)	XBRL Dimensions dimension which is XML schema element with the substitutionGroup value of "xbrldt:dimensionItem"; some characteristics are expressed within an XBRL instance as a context; the concept is expressed using XML Schema elements which have the substitutionGroup value of "xbrli:item". XBRL Formula refers to this as an "aspect"	**Characteristic** – This is part of a characteristic; the actual characteristic itself.	*The "Legal entity" to which a fact relates*
[Member]	XBRL Dimensions Member	**Characteristic value** – The value of a characteristic.	*"Consolidated entity" is the value of "Legal Entity" characteristic*
[Line Items]	Primary Items	**Line items** – Set of concepts	*Assets [Roll up] of a balance sheet*
Concept or **Line Item** (one line item from the set of [Line Items])	XML schema element with the substitutionGroup value of "xbrli:item", a specific type, a specific period, and a specific balance; must NOT be abstract.	**Line Item** – This is the concept characteristic	*Cash and cash equivalents; Assets; Net income (loss)*
Fact	Simple fact (compound facts are not allowed)	**Fact** – Connection of characteristics, a value, traits of the value if numeric, and parenthetical information	*Value of 1000 for the concept "Cash and cash equivalents" for the legal entity "consolidated entity" for the period ended "December 31, 2010" expressed in US Dollars rounded to millions*

Implementation Model Term (US GAAP Taxonomy Architecture /SEC Model Term)	XBRL Technical Syntax Term	Financial Report Semantics and Dynamics Theory Term	*Example*
Business rules, Domain partition aggregation model, Information model	Presentation relations, calculation relations, definition relations, XBRL Formula	**Relations** – The relation from one concept to another concept.	*Assets = Liabilities + Equity; Beginning cash + net cash flows = ending cash*
Flow, uses Network {SortCode} - {Type} - {Title}	*--Does not have this level--*	**Relations between components** – Flow, or the order or sequence of components	*Balance sheet, then income statement, then statement of changes in equity, …*
Roll up, roll forward, hierarchy	*--Does not have this level--*	**Relations between concepts** – Relation between concepts within the concept characteristic	*Roll up, roll forward, hierarchy*
Member aggregation model	*--Does not have this level--*	**Relations between characteristics** – Relations between characteristic members	*North America, United States, Canada*
De facto standard is the RSS Feed provided by SEC	*--Does not have this level--*	Set of financial reports which are being worked with; reading one, comparing across period for same reporting entity; comparing one or more financial reports from multiple reporting entities	*Comparing IBM, Apple, and Microsoft*

26.3. Reconciliation of implementation model terminology to XBRL Abstract Model 2.0 terminology:

Example	US GAAP/SEC Model Object	XBRL Abstract Model 2.0 Object
Financial statement portion of a 10-Q or 10-K; financial statement issued by a private entity	**SEC XBRL financial filing**; XBRL instance + XBRL taxonomy;	Document, Manifest
See the examples from each rudimentary or primitive piece above	**Report element**: Network, [Table], [Axis], [Member], [Line Items], Concept, Abstract concept, Fact, Footnote	Model Element
Balance sheet, significant accounting policies, maturities of long-term debt	**Network**	Cube, Cube Region
Balance sheet, significant accounting policies, maturities of long-term debt	**[Table]**	Cube, Cube Region
The "Legal entity" to which a fact relates	**[Axis]**	Aspect
"Consolidated entity" is the value of "Legal Entity" characteristic	**[Member]**	Aspect Value
Assets [Roll up] of a balance sheet	**[Line Items]**	Aspect
Cash and cash equivalents; Assets; Net income (loss)	**Concept** or **Line Item**	Aspect Value
Assets for the legal entity "consolidated entity" of the reporting entity with CIK 0000000001 for December 31, 2010	**Fact**	Data Point
Note that this is …	**XBRL footnote**	Footnote
US Dollars	**Units**	Aspect, Aspect Value
-6 (rounded to millions)	**Decimals**	Aspect, Aspect Value

26.4. Network

A **network** is a one approach to break a digital financial report into smaller pieces. There are two reasons why you might need to break a financial filing into pieces: because you want to or because you have to.

Property	Meaning/Definition	Example
Identifier	Uniquely identifies the Network. Used mainly by software applications.	http://xasb.org/roles/BalanceSheet
Number	Provides a way to order the network	100000
Category	A network must be either: document, statement, disclosure	Statement
Label	Human readable label for Network	"Balance Sheet"
Table (Collection)	A Network has a collection of Tables. Tables may be explicitly defined or implicitly defined.	All the Facts which are used by the "Balance Sheet" network.

26.5. Table

A **table** is used to combine facts which go together for some specific reason. Tables are comprised of axis and line items. The line items of a table share the axis defined within a table.

There are two types of tables: explicit tables and implicit tables. Implicit tables only have the axis reporting entity and period. An explicit table always has at least one explicit axis, it could have more than one. An explicit table always has one set of line items.

> HINT: Because of the way SEC XBRL works in that tables do not have to be unique within an extension taxonomy, the table plus the network must be used to uniquely identify a table. This is because a table of the same name such as "Statement [Table]" can be used for multiple information sets (such as the balance sheet, income statement, and cash flow statement) and therefore the combination network and table is needed to uniquely identify a specific table. One way to get around this is to implement tables uniquely within a taxonomy. This model suggests that all tables be unique within a taxonomy.

Property	Meaning/Definition	Example
Identifier	Uniquely identifies the Table. Used mainly by software applications.	Unique identifier is the name such as "us-gaap:BalanceSheetTable". Would distinguish from other Tables such as the "Income Statement [Table]", "Maturities of Long term Debt [Table]", "Related Party Transactions [Table]"
Label	Human readable label for Table	"Balance Sheet [Table]"
Documentation	Explanation of the table	Reports the collection of concepts which make up the balance sheet of the reporting entity.
Axis (Collection)	Collection of one to many axis which make up a table. NOTE: A table always has an entity axis. NOTE: A table always has a period axis.	Set of: Period, Entity, Legal Entity [Axis]

Property	Meaning/Definition	Example
Line Items (Collection)	A table has a collection of line items. Line items are comprised of one or more concepts.	Cash and Cash Equivalents, Receivables, Inventory, Prepaid Expenses (i.e. all concepts)

26.6. Sub Component (component block, disclosure block)

A **sub component** is a sub set of line items which have the same information model and go together for some specific purpose. A sub component is an abstract report element in that it is more of an idea for convenience than a necessary report element.

For example, the balance sheet has two sub components: "Assets [Roll Up]" and "Liabilities and Equity [Roll Up]".

Term	Meaning/Definition	Example
Identifier	Uniquely identifies the Line Items. Used mainly by software applications.	us-gaap:AssetsAbstract
Label	Human readable label for Table	"Assets [Roll Up]"
Documentation	Explanation of the line items	The set of all assets of a company.
Concepts (Collection)	Has a collection of one or more components.	

26.7. Axis

An **axis** is a means of providing information about the characteristics of the concepts for the line items within a table regardless of whether that table is explicitly or implicitly defined.

Term	Meaning/Definition	Example
Identifier	Uniquely identifies the Axis. Used mainly by software applications.	us-gaap:LegalEntityAxis
Label	Human readable label for axis	"Legal Entity [Axis]"
Documentation	Explanation of the axis	Used to indicate which legal entity the fact relates.
Domain (relation to)	Has exactly one domain.	"Geographic Area, All Areas [Domain]"
Member (collection), optional	A possible (i.e. allowed) value for a Measure property.	Europe Geographic Area, Asia Geographic Area, Pharmaceuticals Business Segment;
Business rules (collection)	Zero to many business rules which articulate the aggregation model of the axis.	The value of each geographic area [Member] equals the value of the geographic areas [Domain].

26.8. Member

A **member** is a possible value of an axis. A domain is a set of members. A member is always part of a domain of an axis, thus the term "member". A member expresses the value of the axis or characteristic being described. For example, the "Consolidated Entity [Member]" might be the value of the characteristic "Legal Entity [Axis]".

Term	Meaning/Definition	Example
Identifier	Uniquely identifies the Domain. Used mainly by software applications.	dei:ParentCompanyMember
Label	Human readable label for Member	Parent Company [Member]

Term	Meaning/Definition	Example
Documentation	Explanation of the member	Used to indicate that the fact relates to the parent company of the reporting entity.

26.9. Line Items

Line items are a set of concepts which can be reported by an entity, they can contain values. Concepts can be organized within the set of line items using abstracts.

Line items are what amounts to a special type of characteristic or axis. Because the concepts within a set of line items can report fact values, they have data types such as string, monetary, etc. They may also have a balance type (debit or credit), a period type (as of a point in time, for some period, etc.).

Term	Meaning/Definition	Example
Identifier	Uniquely identifies the Line Items. Used mainly by software applications.	us-gaap:BalanceSheetLineItems
Label	Human readable label for Table	"Balance Sheet [Line Items]"
Documentation	Explanation of the line items	Contains all the line items of the balance sheet.
Component (Collection)	Has a collection of one or more components.	

26.10. Concept

A **concept** refers to a financial reporting concept or a non-financial concept which can be reported as a fact within a financial report.

Line items contain concepts organized within a sub component which have the same information model.

Term	Meaning/Definition	Example
Identifier (name)	A unique identifier of a concept, its name. (i.e. not the id attribute)	us-gaap:CashAndCashEquivalents
Standard Label	The standard label of a concept. (Note that concepts MAY also have other labels, but they MUST have one standard label. The "labels collection" is different than the standard label. But, this is part of the labels collection from a syntax perspective.)	Cash and Cash Equivalents
Data type	The data type of a concept which the value must take.	String, monetary, decimals, Boolean, etc.
Period type	The period type of a concept allowed such as of a point in time, for a period of time, or forever.	Instant, duration, forever
Balance type	*Optional*. The balance type of a concept such as debit or credit. Applies only to certain monetary concepts.	Debit, credit
Documentation	*Optional*. The documentation or definition of the meaning of the concept.	Cash includes ....

Term	Meaning/Definition	Example
References	*Optional*. References to one or more external sources of documentation or definitions. This is a collection.	References to the authoritative financial reporting standards.

HINT: the Period type of instant is equivalent to what an accountant refers to as "As of" a point in time. The duration is equivalent to "For Period Ended".

Note that it is the US GAAP taxonomy standard label which should be the primary interface into a concept, not the name of the concept. So, rather than a user seeing "us-gaap:CashAndCashEquivalents" they would see "us-gaap:Cash and Cash Equivalents".

Identifiers and/or names are meaningless tokens whose only use is to serve as a unique identifier to the actual concept.

26.11. Abstract (line items)

Abstract line items are only be used within a set of line items for organizing the line items and may never be reported have the following properties.

Term	Meaning/Definition	Example
Identifier	A unique identifier of a concept, its name. (i.e. not the id attribute)	us-gaap:BalanceSheetAbstract
Label	The standard label of a concept. (Note that concepts MAY also have other labels, but they MUST have one standard label. The "labels collection" is different than the standard label. But, this is part of the labels collection from a syntax perspective.)	Balance Sheet [Abstract]
Documentation	The documentation or definition of the meaning of the concept.	Balance sheet includes ....
Reference (collection)	References to one or more external sources of documentation or definitions. This is a collection.	References to the authoritative financial reporting standards.

26.12. Fact

A **fact** defines a single, observable, reportable piece of information contained within a financial report, or fact value, contextualized for unambiguous interpretation or analysis by one or more characteristics. Numeric fact values must also provide the additional traits "units" and "rounding" to enable appropriate interpretation of the numeric fact value. Facts may have zero or many parenthetical explanations which provide additional descriptive information related to the fact.

A fact could be numeric, non-numeric (i.e. strings), or narrative (i.e. Text Block).

Term	Meaning/Definition	Example
Fact	Fact value is an abstract notion which is broken into two possible concrete possibilities: numeric value or non-numeric value.	Cash and Cash Equivalents on December 31, 2010, for the reporting entity ACME Company, which is a consolidated entity, with a value of 11,000 rounded to the nearest thousands, expressed in US Dollars

Term	Meaning/Definition	Example
Characteristic or Axis (collection)	A notion that represents the collection of information properties which describe the meaning and context of a fact. The axis collection identifies the fact.	Cash and Cash Equivalents on December 31, 2010, Audited, for ACME Company, Actual, etc.
Fact value	Fact value is an abstract notion which is broken into two possible concrete possibilities: numeric value or non-numeric value.	11,000; Or the text "FIFO".
Units (trait)	Numeric fact values only. Describes the units of the fact.	US Dollars
Rounding (trait)	Numeric facts only. Indicates the rounding of the numeric fact value.	Rounded to the nearest thousands
ID	*Optional*. Uniquely identifies the fact. (Required if footnotes are used because they connect the footnote to the fact.)	ID-0001

26.13. Parenthetical Explanation (Footnote)

Facts may have **parenthetical explanations** or **footnotes** which provide additional descriptive information about the fact.

Term	Meaning/Definition	Example
Identifier	Uniquely identifies the footnote.	FN-00001
Footnote	The actual footnote	For additional information see Note B to the financial statements.
Footnote Role	*Optional*. Category into which the footnote fits	Reason not reported

26.14. Concept Relations or Information Model

A **concept relations** model or **information model** describes the organization or relation between concepts within a component.

Concepts are not interspersed randomly within a sub component; they have patterns. Said another way, concepts are organized into different information models. A sub component is a set of concepts which have the same information model pattern or metapattern which are organized and used together for some specific purpose.

Term	Meaning/Definition	Example
[Hierarchy]	A hierarchy information model denotes a hierarchy of concepts with no numeric relations. If no numeric relations exist, then the information model of the component is a hierarchy. Basically, anything can be modeled as a hierarchy. It is the addition of additional relations, typically computations, which turns a hierarchy into some other metapattern.	Accounting policies; Miscellaneous numbers which have no computation relation to other numbers

Term	Meaning/Definition	Example
[Roll Up]	A roll up information model computes a total from a set of other concepts. This information model is commonly referred to a "roll up", or the equation A + B = C. All concepts involved in this information model have the same set of characteristics and all must be numeric.	Calculations of a balance sheet (all concepts); breakdown of assets by business segment.
[Roll Forward]	A roll forward information model reconciles the balance of a concept between two points in time. This information model is commonly referred to a "roll forward" or "movement analysis" or the equation: beginning balance + changes = ending balance. In this equation period [Axis] is as of two different points in time and the changes occur during the period between those two points in time.	Movements in property, plant, and equipment; Cash flow statement; Reconciliation of the change in the number of employees.
[Adjustment]	An adjustment information model reconciles an originally stated balance to a restated balance, the adjustment being the total change, between two different report dates. An adjustment is similar to a roll forward in that it is a reconciliation, however rather than the period [Axis] changing; it is the Report Date [Axis] which changes: originally reported balance + adjustment = restated balance.	Restatements: Originally stated balance + adjustments = Restated balance.
[Variance]	A variance information model reconciles some reporting scenario with another reporting scenario, the variance between reporting scenarios being the variance or changes. For example, a sales analysis which reconciles the concept sales for the reporting scenarios of actual and budgeted is a variance. The equation is: actual – budget = variance.	For example, a sales analysis which reconciles the concept sales for the reporting scenarios of actual and budgeted is a variance. The equation is: actual - budget = variance.
[Complex Computation]	A complex computation information model can be thought of as a hierarchy plus a set of commutations between different concepts within that hierarchy which are challenging to model as the parent/child relations of a graph. The type of computations can vary significantly, thus the challenging in modeling. For example, the computation of earnings per share is a complex computation.	Earnings per share (Net income / shares outstanding) because it is a division
[Text Block]	A text block information model is an information model which contains, by definition, only one concept and that concept expresses what amounts to a narrative or prose as escaped HTML within that one concept. For example, the narrative associated with a set of accounting policies expressed as a list or a table presentation format is a text block. As there is only one concept, there can be no relations within the information model.	An accounting policy, a complex disclosure, an HTML table of information which is disclosed but not "detailed tagged."

Term	Meaning/Definition	Example
[Grid]	A grid information model is a pseudo metapattern which uses the presentation characteristics of the columns and rows of a table to model information. Because the grid models presentation information and not business semantics, it cannot be considered a metapattern. However, the grid is included in this list because the US GAAP Taxonomy uses a grid information model to model the statement of changes in equity.	Statement of changes in equity within the US GAAP taxonomy
Other information models	Some other information model	(Have no examples, from what I can see all information models fit into one of the above)

Additional information model metapatterns could be added if the needs is determined to exist.

26.15. Domain Partition or Member Aggregation Models

A domain is a set of members. Domains have partitions. A partition is collectively exhaustive and mutually exclusive set of members within a domain. Domain partitions do not overlap. Give a set X, a domain partition is a division of X into non-overlapping and non-empty "parts" or "blocks" or "cells" that cover all of X. More formally, these "cells" are both collectively exhaustive and mutually exclusive with respect to the set being partitioned. Domains always has at least one partition and may have many partitions.

The **members** of a **domain** have relations to one another. These relations are referred to as **domain partition or member aggregation models**. There are two dynamics which impact domain aggregation. The first is whether you have a **partial set** or a **complete set** represented by the domain members. The second dynamic is whether the set aggregates or adds up. Axis which express partial sets and describe the characteristics of non-numeric concepts cannot aggregate.

Term	Meaning/Definition	Example
Partial set (or no aggregation)	A partial set is a set which is incomplete so it can never aggregate or a set which describes non-numeric concepts which could never aggregate. A set of numeric concepts which could be aggregated but the aggregated value is illogical or never used is considered a partial set.	A partial set of the classes of cash, a set which describes the accounting policies such as the depreciation method of useful lives of each class. Subsequent events (which are never aggregated) are a partial set. The aggregate value of the useful lives of PPE (a numeric value) is a partial set as the value is illogical.
Complete flat set	A complete flat set is a set which is both complete and characterizes a numeric concept which can be aggregated. A complete flat set is similar to a [Roll Up] information model. The aggregation scheme is that the members of the list aggregate to the parent of those members.	A value of all classes of property, plant and equipment and the value of each class of property, plant and equipment is a complete flat set.

Term	Meaning/Definition	Example
Complete hierarchical set	A complete hierarchical set is a set comprised of a collection of complete flat sets. A business rule will always describe the aggregation scheme.	A breakdown of revenues by geographic area whereby the domain of geographic areas has a hierarchy of geographic regions such as "North America" which makes up one hierarchy and countries such as "United States" and "Canada" which comprise a second hierarchy nested within the first hierarchy.
Complex set	A complex set is a set which has some other set of complex relations expressed within a business rule.	Some complex disclosure.

26.16. Business rules

A **business rule** is a relation between facts. Business rules can be used to verify reported facts within a financial report.

Term	Meaning/Definition	Example
Identifier	A unique identifier of a concept, its name. (i.e. not the id attribute)	Assertion_RollForward_CashFlows_Reconciles
Label	The standard label of a concept. (Note that concepts MAY also have other labels, but they MUST have one standard label. The "labels collection" is different than the standard label. But, this is part of the labels collection from a syntax perspective.)	Roll forward: the concept us-gaap:CashAndCashEquivalents for the beginning of the period plus us-gaap:CashNetChange reconciles to the balance of cash at the end of the period.
Network	The network which the business rule is associated.	http://www.Company.com/CashFlowStatement
Rule	Variable_Cash(beginning) + Variable_ChangeInCash = Variable_Cash (ending)	The actual business rule.

26.17. Labels

Additional labels (i.e. beyond the standard label) for a concept, axis, table, domain, member, line items, other than the standard label which is required and a property of the element.

Term	Meaning/Definition	Example
Identifier	Uniquely identifies the label.	us-gaap_CashAndCashEquivalents
Label	The standard label of a concept. (Note that concepts MAY also have other labels, but they MUST have one standard label. The "label collection" is different than the standard label.) (This is a collection)	Cash and Cash Equivalents, Beginning Balance
Language	Language of the label	en-US
Label Role	What the label is used for, for example: standard label, beginning period label, ending period label, terse label, negated label, etc.	http://www.xbrl.org/2003/role/period-start

HINT: Labels can have different roles. Common roles are the standard role, beginning period labels, ending period labels, terse labels, negated labels.

26.18. References

A concept, table, domain, member, line items may be described by a collection of references. US GAAP taxonomy concepts have references. Extension concepts will not have references.

Term	Meaning/Definition	Example
Identifier	Uniquely identifies the reference.	us-gaap_CashAndCashEquivalents
Reference Role	What the reference is used for, for example: comment, general information, measurement, etc.	
Reference part (collection)	Collection of reference parts	Chapter, page, section, line, etc.

27. APPENDIX: Analysis of 6,751 XBRL-based Public Company 10-Ks Submitted to SEC

XBRL-based digital financial reports are made up of many, many distinct and identifiable pieces. These pieces are related to other pieces in specific and identifiable ways.

27.1. Analysis of 6,751 XBRL-based financial reports

An analysis of 6,751 publically available XBRL-based financial reports[230] provided by public companies to the U.S. Securities and Exchange Commission (SEC) revealed the information which is contained in this document. The purpose of the analysis was to determine the explicit parts of a digital financial report. This analysis used mainly commercially available software provided by XBRL Cloud and SECXBRL.info to perform this analysis data. Information was summarized and reported using Microsoft Access databases and Excel spreadsheets to format information.

Information in this document generally resulted for direct queries to a relational database, XML files (info sets), or commercially available APIs which contained information about the pieces of these reports. The results of this analysis should be repeatable by others.

The document *Understanding the Mechanics of an SEC-type XBRL-based Digital Financial Report*[231] summarizes and explains the pieces of an SEC-type XBRL-based digital financial report and how they relate to one another.

The document *Terminology of a Financial Report*[232] is a set of logical axioms which are written in human readable pseudo code and tries to formally articulate these rules in a concise controlled natural language form. The next step is to covert the pseudo code into finite first-order logic semantics and syntax.

This information is important because it helps software vendors understand how to implement helpful functionality within software to help business professionals using that software create digital financial reports which are consistent with the description of such a report.

27.2. Evaluation against minimum criteria

The following table is a summary of the results of this testing for the current year of 2014 with comparison information provided for 2013 and 2012[233].

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[230] Understanding Public Company XBRL-based Financial Report Quality http://xbrl.squarespace.com/journal/2015/4/7/understanding-public-company-xbrl-based-financial-report-qua.html

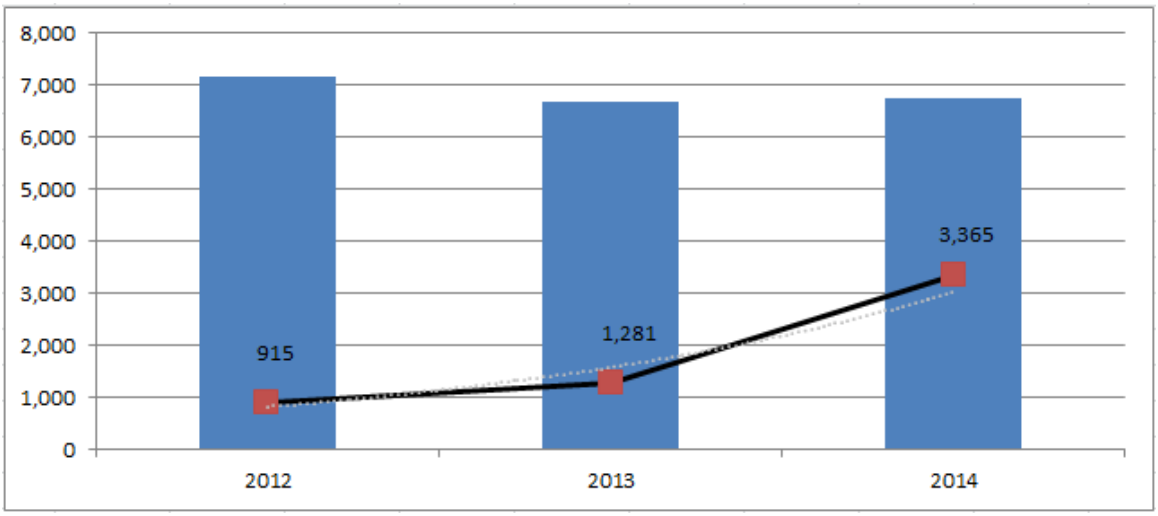
[231] *Understanding the Mechanics of an SEC-type XBRL-based Digital Financial Report*, http://www.xbrlsite.com/2015/Library/UnderstandingTheMechanicsOfAnSECTypeDigitalFinancialReport.pdf

[232] *Terminology of a Financial Report*, http://www.xbrlsite.com/2015/Library/TerminologyOfFinancialReport.pdf

[233] See explanation of minimum criteria in *Arriving at 2014 Digital Financial Reporting All Stars: Summary*, http://www.xbrlsite.com/2015/Library/AnalysisSummary2014_ArrivingAtDigitalFinancialReportingAllStars.pdf

Minimum Processing Steps Measure	**2014**[234]	**2013**[235]	**2012**[236]
Financial reports analyzed (10-Ks for the fiscal year)	6,751	6,674	7,160
Number of "All Stars" (reports consistent with rules)	3,365	1,281	915
Percent of "All Stars" (percent of total which are consistent)	50%	19%	13%

The following chart shows the change in the number of "All Stars" (XBRL-based public company financial reports consistent with all of the minimum criteria consistency tests):



There were two significant differences between testing of 2014 10-K submissions and testing of the prior year 2013 10-K submissions which are worth noting. The first difference is that commercially available software was used for testing of the current 2014 10-K submissions. In the prior year, what can best be described as a mixture of commercial software and working prototype software was used for testing. The second difference was the introduction of report frames for evaluating fundamental accounting concept relations consistency. Report frames or reporting pallets are explained in the document, *Summary Information about Conformance with Fundamental Accounting Concept Relations*[237].

The following is a summary of the 2014 results for each category of the minimum criteria with comparable information for 2013 and 2012:

[234] Set is made up of 10-K submissions to the SEC between April 1, 2014 and March 31, 2015.
[235] See results of 2013 testing, http://www.xbrlsite.com/2014/Library/AnalysisSummary_ArrivingAtDigitalFinancialReportingAllStars.pdf
[236] See results of 2012 testing, http://xbrl.squarespace.com/journal/2014/3/13/set-of-915-digital-financial-reporting-all-stars.html
[237] *Summary Information about Conformance with Fundamental Accounting Concept Relations*, http://www.xbrlsite.com/2014/Library/SummaryInformationAboutConformanceWithFundamentalAccountingConceptRelations.pdf

#	*Goal or Desired State*	*Process tests*	*FY 2014*	*FY 2013*	*FY 2012*
1	**XBRL**: Consistent XBRL technical syntax	Automated XBRL technical syntax consistency checks	**99.9%**	99.9%	99.9%
2	**EFM**: Consistent with EDGAR Filer Manual (EFM) syntax/semantics	Automated EFM syntax and semantics consistency checks	**81.9%**	97.9%	80.5%
3	**Report Level Model Structure**: Consistent report level structure	Automated report model structure consistency checks	**98.2%**	95.8%	97.9%
4	**Root Entity**: Detectable economic entity or accounting entity or "entity of focus"	Successful and unambiguous identification of the "entity of focus"	**99.5%**	99.2%	98.8%
5	**Key Periods**: Detectable and unambiguous current period balance sheet and income statement period dates	Successful and unambiguous identification of the current balance sheet date and income statement period	**99.3%**	98.6%	99.8%
6	**FAC**: Detectable and unambiguous set of fundamental reported facts and intact relations between those fundamental facts which is consistent with expectation	Automated consistency checks to be sure fundamental accounting concepts are distinguishable and the relations between those fundamental concepts are intact/sound	**98.7%**	97.8%	97.9%
7	**PFS**: Detectable basic primary financial statements	Automated detection of balance sheet, income statement, and cash flow statement	**88.7%**	87.8%	NOT TESTED
8	**PFS Roll Ups**: Detectable basic primary financial statement roll up computations are intact which prove trustworthy nature of information (actual computation not tested, only existence of business rules)	Automated verification checks for existence of business rules which articulate these basic primary financial statement relations	**92.0%**	90.5%	84.9%
9	**Reporting Units**: Detectable reporting units of reporting entity.	Automated detection of proper reporting units of reporting entity.	NOT TESTED	NOT TESTED	NOT TESTED

Each category of the minimum criteria shows improvement except for consistency with EFM rules.

27.3. Report

There were 6,751 reports analyzed[238]. All reports were the last 10-K submitted to the SEC between April 1, 2014 and March 31, 2015 by a reporting entity (economic entity):

Reports
6,751

Fiscal Year Focus and Fiscal Period Focus

Each of the 6,751 reports analyzed had an identifiable *fiscal year focus* and *fiscal period focus*:

Fiscal Year Focus	Fiscal Period Focus	Count	Percent of total filings
2014	FY	5,806	86.0%
2013	FY	847	12.5%
2015	FY	36	0.5%
2014	Q4	35	0.5%
2012	FY	15	0.2%
2013	Q4	6	0.1%
2011	FY	2	0.0%
2014	Q2	1	0.0%
2013	Q1	1	0.0%
2013	CY	1	0.0%
	FY	1	0.0%
Total		6,751	100.0%

The one row with no fiscal year focus is a bug in software, the value is provided; however, the value is reported using the wrong period.

Economic entities can pick their own fiscal year focus per the EFM. Economic entities are required to use specific fiscal period focus as described in EFM 6.5.21 which states "***Note: 10-Q's for the 1st, 2nd and 3rd quarters should have a fiscal period focus of Q1, Q2, and Q3 respectively, and a 10-K should have fiscal period focus of FY." Since all of the reports are 10-Ks, then every report which uses Q4, Q2, Q1 or CY for their 10-K is not reporting the information correctly.

As such, all the items in YELLOW appear to be errors in filings.

[238] List of reports analyzed, http://www.xbrlsite.com/2015/Analysis/Analysis_Reports6751.zip

27.4. Reporting units

Within the 6,751 reports analyzed; the reporting units[239] used with to report financial information consisted of the following:

Reporting units	Count	Percent of total filings
iso4217:USD	6,734	99.75%
iso4217:CAD	11	0.16%
iso4217:AUD	2	0.03%
iso4217:EUR	2	0.03%
iso4217:CHF	1	0.01%
iso4217:CNY	1	0.01%
Total	6,751	100.00%

27.5. Economic entity

Within the 6,751 reports analyzed; each report was for exactly 1 economic entity (accounting entity, reporting entity, SEC EFM calls this the "default legal entity". The economic entity is defined in two ways:

- The value of the xbrli:entity/xbrli:identifier (all values in the report are required to be the same per EFM rule 6.5.3)
- The value of the dei:EntityCentralIndexKey fact (in what the SEC EFM calls the "required context"; per rule 6.5.23)

Economic entities have an *entity filer category* (required by SEC EFM, but for some reason 10 filers do not provide this fact):

Entity Filer Category	Total filings per cagetory	Percent of total filings
Smaller Reporting Company	2,939	43.5%
Large Accelerated Filer	1,904	28.2%
Accelerated Filer	1,300	19.3%
Non-accelerated Filer	598	8.9%
NOT PROVIDED	10	0.1%
Total	6,751	100.0%

Economic entities have a *current fiscal year end* (required by SEC EFM, but for some reason 1 filer does not provide this fact):

[239] See ISO 4217 currency codes, http://en.wikipedia.org/wiki/ISO_4217

Entity Fiscal Year End	Count	Percent of total filings
--12-31	4,722	69.9%
--06-30	349	5.2%
--09-30	290	4.3%
--03-31	237	3.5%
--01-31	128	1.9%
--10-31	103	1.5%
--08-31	95	1.4%
--04-30	91	1.3%
--07-31	89	1.3%
--05-31	89	1.3%
--11-30	59	0.9%
--01-03	59	0.9%
--02-28	58	0.9%
--12-28	57	0.8%
--12-27	49	0.7%
--02-01	36	0.5%
--09-27	23	0.3%
--06-28	13	0.2%
--03-30	13	0.2%
--03-29	12	0.2%
--06-29	11	0.2%
--09-28	11	0.2%
--12-26	10	0.1%
--01-02	9	0.1%
--09-26	9	0.1%
--12-30	9	0.1%
--02-02	8	0.1%
--06-27	7	0.1%
Not provided	1	0.0%
All other (generally 52/53 week YE)	104	1.5%
Total	6,751	100.0%

Economic entities have one of 422 different *SIC codes*:

SIC	Description	Count	Percent of total filings
2834	PHARMACEUTICAL PREPARATIONS	372	5.51%
1311	CRUDE PETROLEUM AND NATURAL GAS	261	3.87%
6022	STATE COMMERCIAL BANKS	236	3.50%
7372	SERVICES-PREPACKAGED SOFTWARE	210	3.11%
6798	REAL ESTATE INVESTMENT TRUSTS	208	3.08%
7389	SERVICES-BUSINESS SERVICES, NEC	186	2.76%
6770	BLANK CHECKS	147	2.18%
6021	NATIONAL COMMERCIAL BANKS	136	2.01%
3841	SURGICAL AND MEDICAL INSTRUMENTS AND APPARATUS	116	1.72%
3674	SEMICONDUCTORS AND RELATED DEVICES	115	1.70%
1000	METAL MINING	113	1.67%
6035	SAVINGS INSTITUTION, FEDERALLY CHARTERED	110	1.63%
7374	SERVICES-COMPUTER PROCESSING AND DATA PREPARATION	91	1.35%
2836	BIOLOGICAL PRODUCTS, (NO DISGNOSTIC SUBSTANCES)	81	1.20%
6331	FIRE, MARINE AND CASUALTY INSURANCE	75	1.11%
6500	REAL ESTATE	71	1.05%
4911	ELECTRIC SERVICES	65	0.96%
[illegible]	[illegible]	[illegible]	[illegible]

Note that the SIC code is not contained in the XBRL-based financial filing; it is in the SEC RSS feed.

Legal entity type

Entities have a *legal entity type* which can be gleaned based on the metadata which is used to report (for example whether they report common stock or partner capital):

Entity Filer Category	Total filings per cagetory	Percent of total filings
Corporation	6,353	94.1%
Partnership	389	5.8%
Unknown	5	0.1%
Cooperative	2	0.0%
Association	2	0.0%
Total	6,751	100.0%

27.6. Components (Networks and [Table]s)

XBRL-based public company filings to the SEC do not specify how to break a report into components; however, they do provide breakdowns of a report in two ways: using Networks and using [Table]s. The SEC EFM section 6.7.12 explains how Networks are organized, but it does not explain how [Table]s are organized if there is more than one [Table] per Network. Order of XBRL presentation relations can be used to order [Table]s within a network.

Networks

The reports analyzed had a total of 495,825 Networks.

Those networks contained between 1 and 8 explicitly created [Table]s or implied tables meaning that everything that is not grouped into an explicit table is grouped by the Network into one implied table via that Network relation[240].

# of Tables	Networks with that number	Percent
1 Table	285,392	57.559%
2 Tables	209,357	42.224%
3 Tables	830	0.167%
4 Tables	153	0.031%
5 Tables	51	0.010%
6 Tables	25	0.005%
7 Tables	14	0.003%
8 Tables	3	0.001%
Total Networks	495,825	100.000%

Network Type and Level of Disclosure

Networks can also be broken out by Type[241] and by level[242]. The following is a breakdown of all Networks by both Type and Level. Note that the YELLOW rows appear to be errors because statement and document information are never reported as text blocks:

[240] Reported facts are not "free floating" in space, they exist within some Network. EFM rule 6.12.3 states: "An element used in an instance must participate in at least one effective presentation relationship in the DTS of that instance." So by definition, every fact participates within at least one network; therefore, it can be implied that networks group facts and that no facts are "free floating".

[241] Per EFM 6.7.12, "The {Type} must be one of the words 'Disclosure', 'Document', 'Schedule' or 'Statement'.

[242] Per EFM 6.6.16, 6.6.17, 6.6.19, 6.6.20, 6.6.22, defines each of the levels

Type	Level	Count of Networks	Average per Report
Document	Detail	6,317	0.94
Statement	Detail	43,611	6.46
Statement	TextBlock_L1	188	0.03
Statement	TextBlock_L2	15	0.00
Statement	TextBlock_L3	155	0.02
Disclosure	TextBlock_L1	110,630	16.39
Disclosure	TextBlock_L2	10,167	1.51
Disclosure	TextBlock_L3	75,674	11.21
Disclosure	Detail	246,772	36.55
Schedule	Detail	1,404	0.21
Document	TextBlock_L1	23	0.00
Document	TextBlock_L3	4	0.00
Schedule	TextBlock_L1	741	0.11
Schedule	TextBlock_L2	1	0.00
Schedule	TextBlock_L3	123	0.02
		495,825	73.44

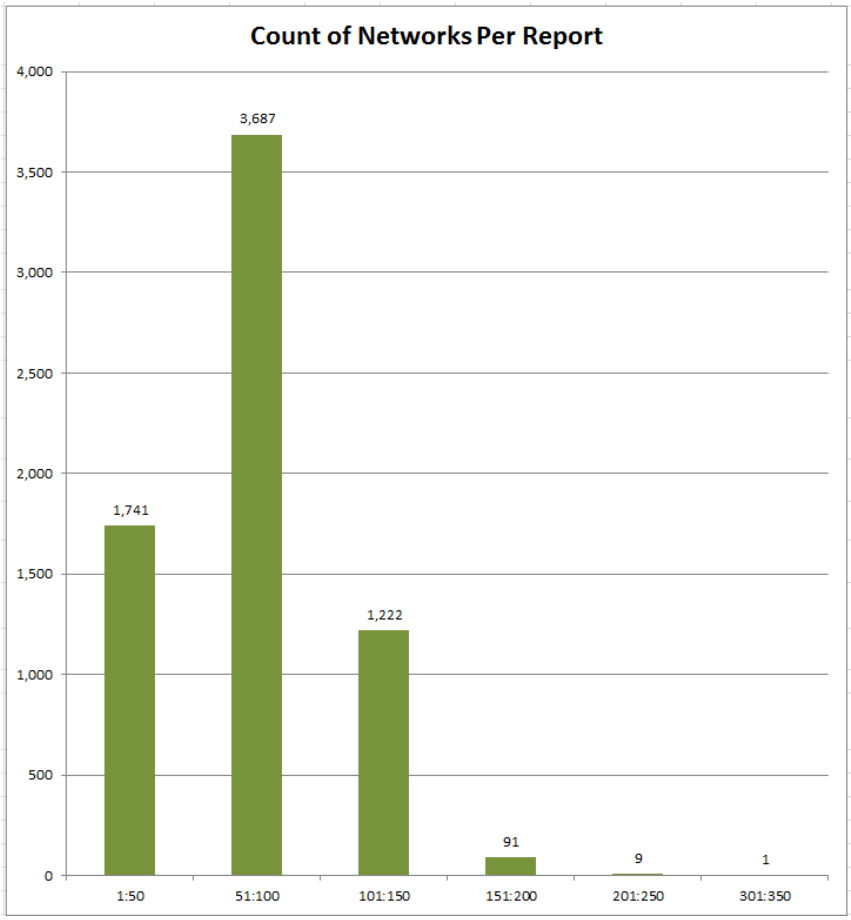
There is no real information which distinguishes between a disclosure and a schedule type. Level 4 Detail and Text Block Levels 1 (Notes), Level 2 (Policies) and Level 3 (Disclosures).

The following breaks Networks out by Detail or the different text block levels. Statements are detail level so detail represents both statements and level 4 detailed disclosures.

Level	Count of Networks	Average per Report
Detail	298,104	44
TextBlock_L1	111,582	17
TextBlock_L2	10,183	2
TextBlock_L3	75,956	11
	495,825	

Text blocks are not provided for document information or the primary financial statements.

Number of networks per report:



The graphic above shows a histogram of the number of networks per report:

Number Of Networks Used Between	Reports With Count	Percent
1:50	1,741	25.79%
51:100	3,687	54.61%
101:150	1,222	18.10%
151:200	91	1.35%
201:250	9	0.13%
301:350	1	0.01%
Total reports	6,751	100.00%

27.7. Facts

The 6,751 financial reports analyzed contain precisely 8,816,913. The following table breaks the facts down by those which use a base US GAAP XBRL Taxonomy concept or an extension concept created by the reporting economic entity:

Type	Count of Facts	Percent of total facts
Base facts	7,404,893	84%
Extension facts	1,412,020	16%
Total	8,816,913	100%

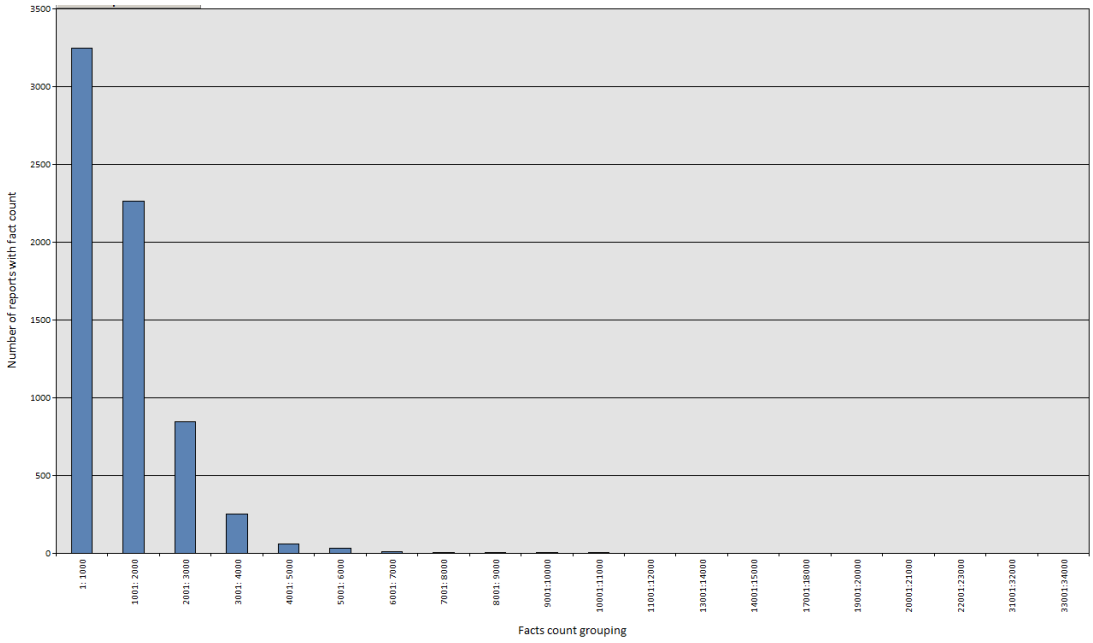
The following table shows average, minimum, and maximum facts per report and per network:

Total reports	6,751
Total networks	495,825
Total facts	8,816,913
Average Networks per Report	73
Average Facts per Report	1,306
Average Facts per **Network**	18
Minimum facts per report	31
Maximum facts per report	33,216
Minimum networks per report	5
Maximum networks per report	321

Histogram of reported facts, groupings of 1000

The following shows a histogram of the number of facts per report. The histogram groups the number of facts reported into increments of 1000. So, 3,249 reports or 48% of total reports provide between 1 and 1000 reported facts.

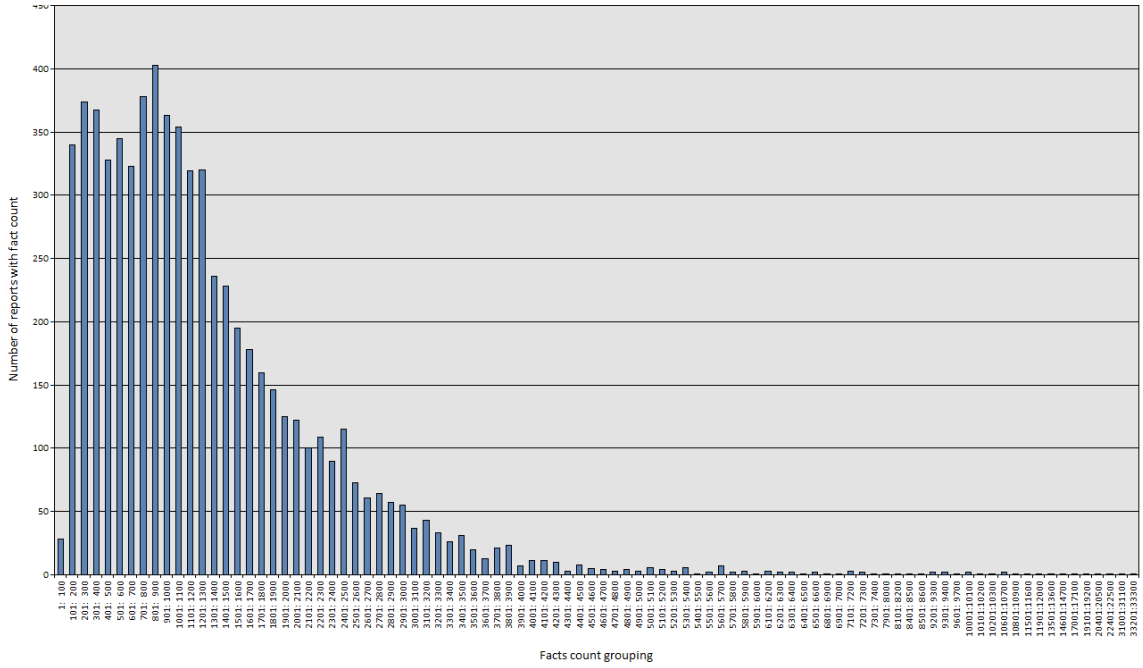
Facts in report between	Count of reports	Percent of total reports
1: 1000	3,249	48%
1001: 2000	2,261	33%
2001: 3000	846	13%
3001: 4000	254	4%
4001: 5000	62	1%
5001: 6000	35	1%
6001: 7000	12	0%
7001: 8000	7	0%
8001: 9000	3	0%
9001:10000	5	0%
10001:11000	7	0%
11001:12000	2	0%
13001:14000	1	0%
14001:15000	1	0%
17001:18000	1	0%
19001:20000	1	0%
20001:21000	1	0%
22001:23000	1	0%
31001:32000	1	0%
33001:34000	1	0%
Total	6,751	100%



Histogram of reported facts, groupings of 100

The chart below groups the range of reported facts into groups of 100. It also shows a cumulative count and percentage. The table shows that 80% of all reports have less than 1900 facts which are reported:

Facts in report between	Count of reports	Percent of total reports	Cumulative Count	Cumulative percent of total
1: 100	28	0.4%	28	0.4%
101: 200	340	5.0%	368	5.5%
201: 300	374	5.5%	742	11.0%
301: 400	367	5.4%	1,109	16.4%
401: 500	328	4.9%	1,437	21.3%
501: 600	345	5.1%	1,782	26.4%
601: 700	323	4.8%	2,105	31.2%
701: 800	378	5.6%	2,483	36.8%
801: 900	403	6.0%	2,886	42.7%
901: 1000	363	5.4%	3,249	48.1%
1001: 1100	354	5.2%	3,603	53.4%
1101: 1200	319	4.7%	3,922	58.1%
1201: 1300	320	4.7%	4,242	62.8%
1301: 1400	236	3.5%	4,478	66.3%
1401: 1500	228	3.4%	4,706	69.7%
1501: 1600	195	2.9%	4,901	72.6%
1601: 1700	178	2.6%	5,079	75.2%
1701: 1800	160	2.4%	5,239	77.6%
1801: 1900	146	2.2%	5,385	79.8%
1901: 2000	125	1.9%	5,510	81.6%
2001: 2100	122	1.8%	5,632	83.4%
2101: 2200	100	1.5%	5,732	84.9%
2201: 2300	109	1.6%	5,841	86.5%
2301: 2400	90	1.3%	5,931	87.9%
2401: 2500	115	1.7%	6,046	89.6%
2501: 2600	73	1.1%	6,119	90.6%
2601: 2700	61	0.9%	6,180	91.5%
2701: 2800	64	0.9%	6,244	92.5%
2801: 2900	57	0.8%	6,301	93.3%
2901: 3000	55	0.8%	6,356	94.1%
3001: 3100	37	0.5%	6,393	94.7%
3101: 3200	43	0.6%	6,436	95.3%
3201: 3300	33	0.5%	6,469	95.8%



27.8. Blocks

A block[243] is a subset of a component that has exactly one concept arrangement pattern. A concept arrangement patterns are relations between the Concepts and Abstracts which make up a set of [Line Items] (primary items). There are 5 clearly identifiable patterns of the arrangements of concepts in the set of 6,751 reports analyzed:

- **Roll up pattern**: identifiable by the existence of XBRL calculations; articulates the relation Concept A + Concept B + Concept *N* = Total.
- **Roll forward pattern**: identifiable by the beginning and ending preferred label roles; articulates the pattern Ending balance = Beginning balance + Additions – Subtractions.
- **Text blocks**: identifiable by the data type of *nonnum:textBlockItemType* which is used on the concept.
- **Hierarchy**: identifiable because it does not fit either of the previous four patterns. Note that there could be other patterns (in fact I know of two other patterns but they are used very rarely)

While blocks really relate to a component, I am relating them to network because I have a better count of networks currently. The following table shows the number of roll ups, roll forwards, text blocks, hierarchies, and total blocks.

Networks	Roll Ups	Roll Forwards	Hierarchies	Text Blocks	Total Blocks	Blocks per Network
495,825	122,274	40,845	180,403	410,908	754,430	1.5
	16%	5%	24%	54%	100%	

[243] See pages 11 and 12 of *Understanding the Mechanics of an SEC-type XBRL-based Digital Financial Report*, http://www.xbrlsite.com/2015/Library/UnderstandingTheMechanicsOfAnSECTypeDigitalFinancialReport.pdf#page=11

27.9. Primary Financial Statement Form

Each of the 6,751 reports analyzed contained primary financial statements. Automated processes were able to successfully detect the balance sheet, income statement (or combined income statement and statement of comprehensive income), and cash flow statement of each report.

Balance Sheet Form

Each of the 6,751 reports analyzed contained a balance sheet and the balance sheet had one of two forms:

Balance sheet form	Count of reports	Percent of total reports
Classified	5,226	77%
Unclassified	1,525	23%
Total	6,751	100%

Income Statement Form

Each of the 6,751 reports analyzed contained an income statement which had one of two forms. The category UNKNOWN relates to special income statement formats used by certain entities, processing is not handling this correctly (basically interest based revenues, insurance based revenues, and securities based revenues are not handled properly yet):

Income statement form	Count of reports	Percent of total reports
Multi-step	3,424	51%
Single-step	2,679	40%
UNKNOWN	648	10%
Total	6,751	100%

Cash Flow Statement Form

Each of the 6,751 reports analyzed contained a cash flow statement and every cash flow statement had exactly the same form.

Statement of Changes in Equity

The statement of changes in equity was not analyzed at this point.

27.10. Report Frames[244]

Each of the 6,751 reports analyzed contained primary financial statements and those primary financial statements followed 86 identifiable patterns called report frames or report pallets. 80% of reports fell into only 9 report frames. Note that there were 7 entities which had some unique report frame which has not been provided for at this point.

Report Frame Code	Count of reports using report frame	Percent of total reports	Cumulative Count	Cumulative percent of total
COMID-BSC-CF1-ISM-IEMIX-OILY	1,810	26.81%	1,810	26.8%
COMID-BSC-CF1-ISS-IEMIX-OILY	1,514	22.43%	3,324	49.2%
COMID-BSC-CF1-ISS-IEMIB-OILY	649	9.61%	3,973	58.9%
INTBX-BSU-CF1-ISS-IEMIX-OILN	563	8.34%	4,536	67.2%
COMID-BSC-CF1-ISM-IEMIB-OILY	311	4.61%	4,847	71.8%
COMID-BSC-CF1-ISS-IEMIX-OILN	212	3.14%	5,059	74.9%
COMID-BSU-CF1-ISS-IEMIX-OILN	169	2.50%	5,228	77.4%
COMID-BSC-CF1-IS6-IEMIX-OILN	168	2.49%	5,396	79.9%
COMID-BSC-CF1-ISM-IEMIX-OILN	149	2.21%	5,545	82.1%
COMID-BSC-CF1-ISS-IEMIB-OILN	146	2.16%	5,691	84.3%
COMID-BSU-CF1-ISS-IEMIB-OILY	102	1.51%	5,793	85.8%
INSBX-BSU-CF1-ISS-IEMIX-OILN	83	1.23%	5,876	87.0%
COMID-BSU-CF1-ISS-IEMIX-OILY	76	1.13%	5,952	88.2%
COMID-BSU-CF1-ISM-IEMIX-OILY	72	1.07%	6,024	89.2%
REITX-BSU-CF1-ISS-IEMIX-OILN	61	0.90%	6,085	90.1%
COMID-BSU-CF1-ISS-IEMIB-OILN	61	0.90%	6,146	91.0%
COMID-BSC-CF1-ISS-IEMIN-OILY	61	0.90%	6,207	91.9%
SECBX-BSU-CF1-ISS-IEMIX-OILN	41	0.61%	6,248	92.5%
COMID-BSC-CF2-ISM-IEMIX-OILY	41	0.61%	6,289	93.2%
COMID-BSC-CF1-ISM-IEMIN-OILY	36	0.53%	6,325	93.7%
COMID-BSC-CF1-ISS-IEMIT-OILY	35	0.52%	6,360	94.2%
COMID-BSC-CF1-ISM-IEMIA-OILY	32	0.47%	6,392	94.7%
COMID-BSC-CF1-ISS-IEMIA-OILY	31	0.46%	6,423	95.1%
COMID-BSC-CF1-ISM-IEMIT-OILY	29	0.43%	6,452	95.6%
REITX-BSU-CF1-ISS-IEMIX-OILY	28	0.41%	6,480	96.0%
UTILX-BSC-CF1-ISS-IEMIA-OILN	27	0.40%	6,507	96.4%
REITX-BSU-CF1-ISS-IEMIB-OILY	17	0.25%	6,524	96.6%
COMID-BSC-CF2-ISS-IEMIX-OILN	15	0.22%	6,539	96.9%
COMID-BSU-CF1-ISM-IEMIB-OILY	14	0.21%	6,553	97.1%
SECBX-BSU-CF1-ISS-IEMIX-OILY	14	0.21%	6,567	97.3%
SECBX-BSC-CF1-ISS-IEMIX-OILY	13	0.19%	6,580	97.5%
COMID-BSC-CF2-ISS-IEMIX-OILY	13	0.19%	6,593	97.7%
COMID-BSU-CF1-ISM-IEMIX-OILN	12	0.18%	6,605	97.8%
REITX-BSC-CF1-ISM-IEMIX-OILY	8	0.12%	6,613	98.0%
REITX-BSC-CF1-ISS-IEMIX-OILY	8	0.12%	6,621	98.1%
COMID-BSC-CF1-ISM-IEMIB-OILN	8	0.12%	6,629	98.2%
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[244] See page 33 of *Understanding the Mechanics of an SEC-type XBRL-based Digital Financial Report*, http://www.xbrlsite.com/2015/Library/UnderstandingTheMechanicsOfAnSECTypeDigitalFinancialReport.pdf#page=33

Accounting activity or industry

The following breaks reporting entities out by accounting activity or industry:

Report Frame Code Component	Count of reports using report frame	Percent of total reports
COMID (Commercial and industrial)	5,824	86.27%
INTBX (Interest based revenues)	563	8.34%
REITX (Real estate investment trust)	154	2.28%
SECBX (Securities based revenues)	91	1.35%
INSBX (Insurance based revenues)	85	1.26%
UTILX (Utility)	27	0.40%
OTHER (Some other format)	7	0.10%
Total	6,751	100.00%

Balance sheet format

The following breaks reporting entities out by balance sheet format:

Report Frame Code Component	Count of reports using report frame	Percent of total reports
BSC (Classified)	5,373	79.59%
BSU (Unclassified)	1,368	20.26%
BSL (Liquidy basis)	3	0.04%
OTHER (Some other format)	7	0.10%
Total	6,751	100.00%

Cash flow statement format

The following breaks reporting entities out by cash flow statement format:

Report Frame Code Component	Count of reports using report frame	Percent of total reports
CF1 (Exchange gains in net cash flow)	6,652	98.53%
CF2 (Exchange gains in roll forward)	92	1.36%
OTHER (Some other format)	7	0.10%
Total	6,751	100.00%

Income statement format

The following breaks reporting entities out by income statement format:

Report Frame Code Component	Count of reports using report frame	Percent of total reports
ISS (Single step, with totals)	4,039	19.94%
ISM (Multi-step)	2,537	12.53%
IS6 (Single step, no total expenses)	168	0.83%
OTHER (Some other format)	7	0.03%
Total	6,751	100.00%

Reporting of income (loss) from equity method investments

The following breaks reporting entities out by where the line item Income (loss) from equity method investments is reported:

Report Frame Code Component	Count of reports using report frame	Percent of total reports
IEMIX (Income from equity method investments not reported)	5,095	75.47%
IEMIB (Income from equity method investments reported before tax)	1,333	19.75%
IEMIN (Income from equity method investments reported as part of nonoperating income (loss))	116	1.72%
IEMIA (Income from equity method investments reported after tax with special report items)	110	1.63%
IEMIT (Income from equity method investments reported as part of income tax expense)	73	1.08%
IEMIR (Income from equity method investments reported as part of revenues)	17	0.25%
OTHER (Some other format)	7	0.10%
Total	6,751	100.00%

Reporting of operating income (loss)

The following breaks reporting entities out by whether the line item Operating income (loss) was or was not reported:

Report Frame Code Component	Count of reports using report frame	Percent of total reports
OILY (Operating income (loss) reported)	4,957	73.43%
OILN (Operating income (loss) not reported)	1,787	26.47%
OTHER (Some other format)	7	0.10%
Total	6,751	100.00%

27.11. Fundamental accounting concepts

Closely related to report frames[245] are fundamental accounting concepts and relations between fundamental accounting concepts. Each report frame has a set of fundamental accounting concepts and relations between concepts. However, most report frames share the majority of relations. The following is a summary of XBRL-based public company financial filings to fundamental accounting concept relations in general:

#	Category	Test Code	Fundamental accounting concept relation	Total filings	Consistent with rule	Consistent %	Inconsistent with rule	Inconsistent %
1	BS	BS1	Equity = Equity Attributable to Parent + Equity Attributable to Noncontrolling Interest	6,751	6,655	98.58%	96	1.42%
2	BS	BS2	Assets = Liabilities and Equity	6,751	6,734	99.75%	17	0.25%
3	BS	BS3	Assets = Current Assets + Noncurrent Assets (classified balance sheet)	6,751	6,393	94.70%	358	5.30%
4	BS	BS4	Liabilities = Current Liabilities + Noncurrent Liabilities (classified balance sheet)	6,751	6,672	98.83%	79	1.17%
5	BS	BS5	Liabilities and Equity = Liabilities + Commitments and Contingencies + Temporary Equity + Redeemable Noncontrolling Interest + Equity	6,751	6,472	95.87%	279	4.13%
6	CF	CF1	Net Cash Flow = Net Cash Flows, Operating + Net Cash Flows, Investing + Net Cash Flows, Financing + Exchange Gains (Losses)	6,751	6,435	95.32%	316	4.68%
7	CF	CF2	Net Cash Flows, Continuing = Net Cash Flows, Operating, Continuing + Net Cash Flows, Investing, Continuing + Net Cash Flows, Financing, Continuing	6,751	6,542	96.90%	209	3.10%
8	CF	CF3	Net Cash Flows, Discontinued = Net Cash Flows, Operating, Discontinued + Net Cash Flows, Investing, Discontinued + Net Cash Flows, Financing, Discontinued	6,751	6,711	99.41%	40	0.59%
9	CF	CF4	Net Cash Flows, Operating = Net Cash Flows, Operating, Continuing + Net Cash Flows, Operating, Discontinued	6,751	6,719	99.53%	32	0.47%
10	CF	CF5	Net Cash Flows, Investing = Net Cash Flows, Investing, Continuing + Net Cash Flows, Investing, Discontinued	6,751	6,738	99.81%	13	0.19%
11	CF	CF6	Net Cash Flows, Financing = Net Cash Flows, Financing, Continuing + Net Cash Flows, Financing, Discontinued	6,751	6,747	99.94%	4	0.06%
12	IS	IS1	Gross Profit = Revenues - Cost Of Revenue (Multi-step approach)	6,751	6,354	94.12%	397	5.88%
13	IS	IS2	Operating Income (Loss) = Gross Profit - Operating Expenses + Other Operating Income (Expenses) (Multi-step approach)	6,751	6,439	95.38%	312	4.62%
14	IS	IS3	Income (Loss) from Continuing Operations Before Equity Method Investments = Operating Income (Loss) + Nonoperating Income (Loss) - Interest And Debt Expense	6,751	6,179	91.53%	572	8.47%
15	IS	IS4	Income (Loss) from Continuing Operations Before Tax = Income (Loss) from Continuing Operations Before Equity Method Investments + Income (Loss) from Equity Method Investments	6,751	6,691	99.11%	60	0.89%
16	IS	IS5	Income (Loss) from Continuing Operations after Tax = Income (Loss) from Continuing Operations Before Tax - Income Tax Expense (Benefit)	6,751	6,334	93.82%	417	6.18%
17	IS	IS6	Net Income (Loss) = Income (Loss) from Continuing Operations After Tax + Income (Loss) from Discontinued Operations, Net of Tax + Extraordinary Items, Gain (Loss)	6,751	6,360	94.21%	391	5.79%
18	IS	IS7	Net Income (Loss) = Net Income (Loss) Attributable to Parent + Net Income (Loss) Attributable to Noncontrolling Interest	6,751	6,351	94.07%	400	5.93%
19	IS	IS8	Net Income (Loss) Available to Common Stockholders, Basic = Net Income (Loss) Attributable to Parent - Preferred Stock Dividends and Other Adjustments	6,751	6,713	99.44%	38	0.56%
20	SCI	IS9	Comprehensive Income (Loss) = Comprehensive Income (Loss) Attributable to Parent + Comprehensive Income (Loss) Attributable to Noncontrolling Interest	6,751	6,605	97.84%	146	2.16%
21	SCI	IS10	Comprehensive Income (Loss) = Net Income (Loss) + Other Comprehensive Income (Loss)	6,751	6,464	95.75%	287	4.25%

Report frames provide a more precise set of relations.

245 See fundamental accounting concept relations per report frame, http://www.xbrlsite.com/2015/fro/us-gaap/html/reportFrames/

27.12. Parenthetical Explanations

The 6,751 reports analyzed contained a total of 27,909 parenthetical explanations (implemented in the form of an XBRL footnote) with an average of 4.1 parenthetical explanations per report.

Reports	Count of Parenthetical Explanations	Blocks per Network
6,751	27,909	4.1

The minimum number of parenthetical explanations was 0 with 61% of all reporting entities reporting no parenthetical explanations, the maximum 303 parenthetical explanations. The following shows a histogram of the number of parenthetical explanations:

Range of Count of Parenthetical Explanations	Count of Reports	Percent of total reports
: 0	4,106	61%
1: 10	1,896	28%
11: 20	378	6%
21: 30	165	2%
31: 40	82	1%
41: 50	47	1%
51: 60	31	0%
61: 70	13	0%
71: 80	7	0%
81: 90	7	0%
91:100	4	0%
101:110	2	0%
111:120	3	0%
121:130	3	0%
131:140	3	0%
141:150	2	0%
151:160	1	0%
301:310	1	0%
Total	6,751	100%

27.13. Going Concern and Developing Stage

Of the 6,751 reports analyzed, 80% had neither going concern issues nor was a developing stage enterprise. 4% had both going concern issues and were developing stage enterprises:

Is Developing Stage	Is Going Concern	Count of Reports	Percent of total reports
NO	NO	5,400	80%
NO	YES	863	13%
YES	YES	301	4%
YES	NO	187	3%
	Total	6,751	100%

27.14. Relations between report elements

The 6,751 reports had a total of 6,142,578 relations between report elements which were used to represent the information reported in the XBRL-based financial report. These report elements could be grouped into the following classes or categories:

Relationship perspective: (2014)			
Class	Total relations	Unambigous relations	Undefined or ambigous relations
Networks	494,219	494,174	45
Tables	617,897	617,710	187
Axis	475,281	475,280	1
Member	849,704	849,583	121
LineItems	1,306,473	1,306,376	97
Abstracts	2,387,613	2,387,425	188
Concepts	11,391	11,380	11
Total	6,142,578	6,141,928	650
Percent	100.00%	99.99%	0.01%

Of the total relations, 99.99% of the relations were unambiguous; .01% were ambiguous. The table below shows parent report elements across the top and child report elements in the rows, and the count of the number of relations between the child class and the parent class within the cells of the table:

		2014 10-Ks LAX Model, SEC filers supported						
		Parent						
		Network	Table	Axis	Member	LineItems	Abstract	Concept
		495,825	211,910	406,005	1,324,898	211,995	742,468	3,245,302
Child	Network	0	0	0	0	0	0	0
	Table	682	0	0	0	5	211,212	11
	Axis	0	405,998	0	0	0	7	0
	Member	4	0	475,280	849,583	2	29	0
	LineItems	41	211,712	0	0	90	152	0
	Abstract	493,480	168	0	3	100,789	147,603	425
	Concept	12	19	1	118	1,205,587	2,028,610	10,955
		494,219	617,897	475,281	849,704	1,306,473	2,387,613	11,391

RED cells indicate relations rules enforced by XBRL technical syntax validation. Note that all such relations are consistent. GREEN relations are anticipated and unambiguous relations. TAN relations are relations which are anticipated to NEVER exist, and they do not exist because the count in the cell is 0; so these are consistent with expectation. ORANGE cells indicate unexpected relations and therefore are deemed inconsistent. Some of these inconsistent relations to not impact interpretation of information. YELLOW relations are not ambiguous, not generally expected, but don't seem to cause interpretation issues.

27.15. Comparison of report quality by generator

The quality of public company XBRL-based digital financial reports continues to increase. There are two significant trends. First, between 2013 and 2014 overall consistency with all the rules in a set of 21 fundamental accounting concept relationship rules grew to 53.8% from the comparable overall consistency of 25.6% a year ago.

The second trend is that you can see an increasing spread between the quality levels between generators, the software vendors and filing agents which are used to create these XBRL-based digital financial reports. Here is a summary of the current results (for 2014 10-K filings):[246]

April 1, 2015 (Final for 2014 10-Ks)					
Generator	Filings Count	Filings With No Errors	Sum Errors (all filings)	Average Errors per Filing	Percent Without Error
Trintech	1	1	0	.0	100%
SAP Disclosure Management	4	3	1	.3	75%
RR Donnelley	947	687	376	.4	73%
Compliance Xpressware	83	55	43	.5	66%
P3 Data Systems	199	131	107	.5	66%
DataTracks	400	247	246	.6	62%
CompSci	413	254	237	.6	62%
Ez-XBRL	331	203	196	.6	61%
Unknown	34	20	25	.7	59%
Rivet	230	135	161	.7	59%
Workiva (WebFilings)	1,925	1,090	1,315	.7	57%
Merrill	476	263	297	.6	55%
Accelus	196	106	135	.7	54%
NeoClarus	93	49	85	.9	53%
Novaworks Software	551	285	455	.8	52%
Oracle	2	1	2	1.0	50%
GoXBRL	269	132	233	.9	49%
QXi	156	75	131	.8	48%
IBM Cognos	100	47	92	.9	47%
Advanced Computer Innovations	323	143	310	1.0	44%
SmartXBRL	5	2	5	1.0	40%
Fujitsu	13	5	11	.8	38%
	6,751	3,934	4,463	.7	
Percent of all filings conforming to all FAC relations		58.3%			

[246] Public Company XBRL Quality Increases Significantly, http://xbrl.squarespace.com/journal/2015/4/2/public-company-xbrl-quality-increases-significantly.html

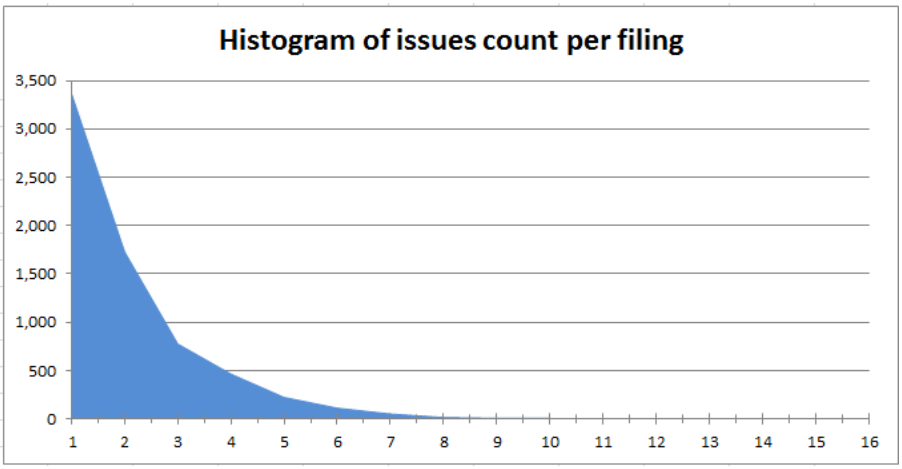
27.16. Quality gap

The table below shows a histogram of issues discovered related to an analysis of the fundamental accounting concepts reported in 2014 to the SEC within XBRL-based financial reports.

The histogram shows that 98.77% of public companies are 5 or fewer fundamental accounting concept inconsistencies away from being 100% consistent with this basic set of accounting relations:

# of Issues per Filing	# of Filings with this Issues Count	Cumulative Number of Filings	% of Total Filings
0	3,365	3,365	49.84%
1	1,729	5,094	75.46%
2	776	5,870	86.95%
3	464	6,334	93.82%
4	223	6,557	97.13%
5	111	6,668	98.77%
6	51	6,719	99.53%
7	15	6,734	99.75%
8	6	6,740	99.84%
10	5	6,745	99.91%
45	1	6,746	99.93%
11	1	6,747	99.94%
15	1	6,748	99.96%
16	1	6,749	99.97%
30	1	6,750	99.99%
32	1	6,751	100.00%

This is the same information shown graphically:



28. APPENDIX: Top XBRL Technical Syntax Related Modeling Tips

The following is a summary of the top 10 XBRL taxonomy and XBRL instance creation tips which will help you create quality systems which make use of XBRL, helping a business domain achieve what they are striving to achieve.

Generally business professionals will never need to deal with these sorts of issues as software will hide the issues from users. However, today software does not hide these XBRL technical syntax related issues. As such, we point them out.

28.1. Define a clear, logically coherent, unambiguous, formally documented financial report model layer

Define a clear, unambiguous, formally documented financial report model layer. At a minimum the XBRL Abstract Model 2.0 should be followed. Alternatively, some model terminology which is consistent with that model should be clearly defined.

For more information see:

http://xbrl.squarespace.com/journal/2012/6/15/xbrl-international-releases-semantic-model-public-working-dr.html

28.2. Define a clear, logically coherent, unambiguous, formally documented information model

Define a clear, unambiguous, formally documented information model. One of the biggest problems XBRL taxonomies have is inconsistent information models. An information model is simply how the relations within a taxonomy are structured. This is of particular importance when extensibility is employed within your system. For example, the US GAAP Taxonomy creates structures such as [Table]s, [Roll Forward]s, and other such structures. They explain how these structures are to be created. You should do the same in order to be able to evaluate how your taxonomy is created and in order to explain how your taxonomy should be extended. Taxonomies are simply not random. Make yours clear, unambiguous, and formally document it so those extending your taxonomy can follow the rules.

28.3. Don't mix dimensional and non-dimensional models

Don't mix dimensional and non-dimensional models; personally I prefer a dimensional model. If you use XBRL Dimensions, then every concept should be attached to a hypercube thus requiring the dimensions of the concept to be explicitly identified. Mixing a dimensional model and a non-dimensional model causes headaches which can be avoided by simply using one model or the other. Since business information is inherently dimensional anyway, I personally prefer a dimensional model, using XBRL Dimensions consistently throughout your XBRL taxonomy. Mixing models also make using XBRL Formula much trickier.

28.4. Make each hypercube unique (use isomorphic hypercubes)

Make each hypercube unique. There are advantages to making each hypercube in an XBRL taxonomy unique. Take a look at this taxonomy. Search for the line items

which say "Statement [Table]". You can see what I am talking about more clearly by looking at this. What is the point of using the same hypercube for each set of dimensions and concepts? Why not use a different unique hypercube name for each hypercube? This has a number of benefits, including making the extended link as any form of semantics unnecessary. The FINREP taxonomy makes each hypercube unique.

28.5. Close all hypercubes

Be sure to require that all hypercubes be closed. All hypercubes you create which have an "all" role should be closed (and all your hypercubes which have a "notAll" role should be open if you happen to use those). Leaving a hypercube open basically lets anything exist in the context. What is the point of that? Be explicit and close all your hypercubes.

28.6. Provide dimension-defaults for each dimension

Each dimension should have a dimension-default. Much confusion exists as to what dimension-defaults actually do and software interoperability can be an issue with dimension-defaults. To achieve maximum reliability, predictability and therefore safety always provide a dimension-default.

The purpose of a dimension-default is to enable one hypercube to intersect with one or more other hypercubes.

28.7. Clearly differentiate members and concepts

Always clearly differentiate dimension values and concepts. When creating an XBRL taxonomy you don't want users of the taxonomy to mix up what is a dimension value (such as a domain or a member) and what is a concept which can be used to report a value. The US GAAP Taxonomy differentiates domains and members by appending "[Domain]" or "[Member]" to such dimension values and assigning those types of elements to a special type value of "domainItemType". You could also use the substitutionGroup to differentiate these two types of XML Schema elements. That way, users don't get confused.

28.8. Use either segment or scenario, there is no real reason to use both

Use either segment or scenario, there is no real reason to use both. Eliminating unnecessary options makes things easier. There is no semantic difference between using the segment context element and the scenario context element. Besides, if different XBRL instance creators use different elements, comparability then becomes an issue. You can avoid both of these problems by simply using one or the other. Which is as easy as tossing a coin really. Using scenario seems to be the best, but the US GAAP Taxonomy suggests segment. You can pick.

28.9. Use XBRL Dimensions or use tuples, don’t use both in the same XBRL taxonomy

Tuples and XBRL Dimensions are redundant in that they are basically two syntaxes for doing what amounts to the same thing. Each has its pros and cons. Pick and use one or the other; personally I prefer XBRL Dimensions. The biggest problem with

using both tuples and XBRL Dimensions is explaining when to use one and when to use the other. The primary reason I don't like tuples is because they significantly inhibit extensibility. Basically, tuples add back the XML content model with XBRL worked to remove. XBRL Dimensions can do everything that tuples can do, but tuples are not nearly as functional as XBRL Dimensions.

28.10. Use decimals or precision, don't allow both

Precision and decimals are redundant, pick and use one or the other; personally I prefer decimals. The precision and decimals attribute on a fact value serves the same purpose. There is pretty much universal agreement that only one of these should have been created. Having both causes more work when working with XBRL instance information which contains both. FRTA suggests that decimals be used. So does the US GAAP Taxonomy. I agree and suggest using decimals because it is easier for business professionals to understand.

28.11. Avoid complex typed members unless you really need them

Don't use complex typed members for a dimension unless you really need them. Complex typed members allow literally any XML you can think of as a possible value, except for XBRL itself. It is way too much to ask for a software application to implement something like this. Further, using it to compare to entities effectively can be quite challenging. You can achieve the same results by using a number of simple typed members, which are much easier to build an interface for and easier to make work. Complex typed members for dimension values are far more trouble than they are worth and should be avoided.

28.12. Be explicit, consistent and concise when expressing taxonomy information

Don't be redundant in expressing taxonomy information. If you express things twice in two different ways, you create work in that you now have to make sure the two things you are expressing are in sync. For example, expressing information in a presentation linkbase and also in a definition linkbase causes such redundant information. The FINREP taxonomy figured this out and does not make a presentation linkbase available with its taxonomy. In the short term this can be a bit of a challenge to effectively do because most software applications rely on the presentation linkbase. Overtime and as software gets better, this will not be an issue. First, realize that you are creating redundant information. Second, if you can, you may want to consider not making this redundant information available in your XBRL taxonomy.

28.13. Consider ditching XBRL calculations

Give serious consideration to using XBRL Formula rather than XBRL calculations. XBRL Formula is several orders of magnitude more powerful that XBRL calculations. Also, XBRL calculations have their idiosyncrasies. More and more people are moving to XBRL Formula. You may want to give strong consideration to abandoning XBRL calculations and using XBRL Formula instead. XBRL calculations can be easier in certain situations. The trade-offs should be understood and evaluated in making your decision.

28.14. Realize that XBRL instance contexts and XBRL Dimensions hypercubes constrain facts differently

XBRL has two mechanisms for defining contextual information and those two ways work differently. The two ways are XBRL contexts and XBRL Dimensions hypercubes. Two specific pieces of an XBRL context, entity identifier and period, must exist on every XBRL Fact. They are unconstrained and not impacted by any context constrains defined by an XBRL Dimensions hypercube. Segment and scenario information not defined by XBRL Dimensions works this way also. XBRL Dimensions hypercubes is another way of constraining information, basically the dimensions or Measures associated with a Fact.

29. APPENDIX: Benefits and Limitations of Inline XBRL

Another approach to using XBRL is Inline XBRL (iXBRL). There are advantages to iXBRL.

29.1. Benefits of inline XBRL

Here is a summary of the advantages of iXBRL:

- **Decouples presentation and data model**. Using Inline XBRL allows for the "decoupling" of two things which, when dealt with together, cause problems. Inline XBRL allows the HTML aspect to deal with presentation, and therefore the creator of the data model is free to create a good data model and not try and get the presentation they are seeking by using the XBRL taxonomy. For example, SEC XBRL filers seek a certain presentation and to get that they leverage the only thing they think they have at their disposal with is the XBRL taxonomy. Using Inline XBRL for the presentation gives one precise control of the presentation. Not having to worry about the differences in presentation and presentation nuances allows for more "freedom" in creating a sound data model.
- **Document of record**. Inline XBRL offers the possibility of having a "document of record" which is readable by both humans (i.e. the HTML aspect of Inline XBRL) and computers (i.e. the XBRL aspect of Inline XBRL). One does need to be careful to ensure that the information communicated and viewed as HTML is identical to the information a computer application reads, both should be in sync. But that does not seem that challenging and it is certainly easier than what SEC XBRL filers have to do which is keep separate HTML and XBRL documents in sync.
- **Evolutionary path**. Inline XBRL seems to offer a nice evolutionary path which a lot of people seem to need. Personally, I am very confident that most people will eventually never use that HTML rendering in favor of the dynamic or "interactive" aspects of XBRL. For example, consider what I call the "hypercube jumping" (really has more to do with dimensions) and discuss in this blog post. But Inline XBRL does not take away the possibility of these dynamic features, they are still there to use, even if the XBRL is buried in an HTML document.
- **Zero difference between XBRL and Inline XBRL**. To a computer application trying to read the information, there is zero difference between a plain ole XBRL instance and an Inline XBRL document (instance, not sure what to call it). From the computer's perspective, they are 100% interchangeable. Now, I am sure that there are probably interoperability issues and bugs which might need working through, but that is all part of the process of getting things to work on a global scale.

Because of these advantages, there is enough of a probability that the SEC could move to Inline XBRL at some point in the future. This is worth keeping in the back of one’s mind.

29.2. Disadvantages of inline XBRL

This is a summary of the apparent disadvantages of Inline XBRL:

- **More work**. In order to create the pixel perfect rendering which Inline XBRL is capable of providing, additional work needs to be done to map reported facts to their location in the rendering. A cost/benefit analysis can show the value of going through this additional work. But to do this analysis properly, one needs to see quality renderings of properly represented information using a quality rendering engine. Judging the renderings one sees today which are of poorly represented information and substandard rendering engines would not provide a fair assessment.
- **Text blocks not identifiable**. Currently, the SEC requires public companies to provide Level 1, Level 2, and Level 3 [Text Block]s of information. There is no standard way to identify a component of a report in the actual XHTML and therefore there is no way to identify [Text Block]s and be able to directly use what you can now use from the Level 1 footnotes, Level 2 policies, and Level 3 disclosures.

30. APPENDIX: Notion of Profiles, General Application Profile, and NOLAP

No one "implements XBRL". Each different implementation which chooses to make us of XBRL picks and chooses what they implement. It takes a highly skilled engineer/architect to pick the right pieces, put them together correctly, and otherwise design a high quality system. This approach is time consuming, expensive, and takes a high level of skill.

30.1. Application profile

An alternative is to make use of an existing profile or "application profile[247]" which is proven, tested, designed by world-class engineers. For example, the US GAAP XBRL Taxonomy Architecture is a profile.

General Information						
Profile name:	**SEC 10-K and 10-Q (Financial Reporting) Profile**	**SEC Risk Return Profile**	**Government of India, Ministry of Corporate Affairs Profile**	**IFRS, Global Filer Manual**	**XBRL Abstract Model 2.0**	**General Purpose, Explicit, Unambiguous XBRL-based Digital Financial Reporting Profile (Semantic Spread sheet)**
Profile description	Reporting by public companies to the US Securities and Exchange Commission; Forms 10K, 10Q	Reporting by mutual funds to the US Securities and Exchange Commission; Forms 485BPOS, 497	Reporting to Ministry of Corporate Affairs; forms 23AC-XBRL, 23CA-XBRL	Financial reporting with IFRS	General purpose, proof of concept	General purpose financial reporting by private companies
For more information	http://xbrl.sec.gov/	http://xbrl.sec.gov/	http://www.mca.gov.in/XBRL/			http://digitalfinancialreporting.wikispaces.com/home
Component defined as	Network + Hypercube (implied or explicit)	Network + Hypercube (implied or explicit)	Network + Hypercube (implied or explicit)	Network + Hypercube (implied or explicit)	Network + Hypercube (implied or explicit)	Network + Hypercube (explicit only, implied not allowed)
Terms (XBRL Term)						
Network	Network	Network	Network	Network	None	Network
Hypercube	Table	Table	Table	Table	Cube	Table or Hypercube
Dimension	Axis	Axis	Axis	Axis	Aspect	Axis or Dimension
Member	Member	Member	Member	Member	Member	Member
Primary items	Line Items	Line Items	Line Items	Line Items	Aspect	Line Items or Primary Items
Primary item	Line item	Line item	Line item	Line item	Concept	Concept
Fact	Fact	Fact	Fact	Fact	Data Item	Fact
Decimals	Rounding	Rounding	Rounding	Rounding	Decimals	Rounding
XBRL Footnote	Parenthetical explanation	Parenthetical explanation	Parenthetical explanation	Parenthetical explanation	XBRL Footnote	Parenthetical explanation
Configuration options						
Semantics of an XBRL instance context entity	Reporting entity	Reporting entity				Reporting entity
Semantics of an XBRL instance context period	Calendar period	Calendar period				Calendar period

So, if you are building a system, using an existing application profile which someone else has defined or taking an existing application profile and tweaking it is a rational approach.

30.2. General business reporting application profile

Another important notion is that of a general application profile. What if someone did not want to build a system, all they wanted to do is pick up a system which makes use of XBRL and start using it.

That is the purpose of the General Business Reporting Application Profile which is documented here:

http://www.xbrlsite.com/2014/Library/GeneralBusinessReportingProfile-2013-11-30.pdf

The general business reporting application profile is defined as:

[247] Application profile, http://en.wikipedia.org/wiki/Application_profile

> "The general business reporting application profile is an application profile of XBRL which is 100% compliant with the XBRL 2.1, XBRL Dimensions, and XBRL Formula specifications. It is possible to create SEC XBRL financial filings using this more disciplined application profile, but not all SEC XBRL financial filings are compliant with this profile."

The general application profile is very similar in architecture to the US GAAP XBRL Taxonomy Architecture. However, it is far more disciplined and rigorous and controls or eliminates unnecessary flexibility.

Entropy is the notion of "lack of order or predictability; gradual decline into disorder." Order is created. When only one option is necessary, if two options exist the fact that someone needs to then choose between two options means that the task is more complex.

30.3. NOLAP or the semantic spreadsheet

NOLAP or *Not Only SQL Analytical Processing (NOLAP) XBRL Application Profile* is described as follows:

> "The Not Only SQL Analytical Processing (NOLAP) XBRL application profile is an application profile of XBRL which is 100% compliant with the XBRL 2.1, XBRL Dimensions, XBRL Formula, and Generic Linkbase specifications. The profile follows the spirit of the XBRL Abstract Model 2.0 Public Working Draft. It can be used to create OLAP-type hypercubes or digital spreadsheets of either low or high information fidelity. This document is a non-normative explanation of NOLAP, see the formal specification for normative guidance."

Documentation for the NOLAP application profile can be found here:

http://www.xbrlsite.com/2014/Library/NOLAP-2014-07-01.pdf

The notion of NOLAP is described here in this blog post:

http://xbrl.squarespace.com/journal/2014/5/1/nolap-xbrl-based-global-standard-olap-no-sql-required.html

Essentially, NOLAP is a standard cube. A cube can be considered a generalization of a three-dimensional spreadsheet.

While traditional OLAP is a powerful and useful tool, OLAP has many known limitations including:

- There is no global standard for OLAP (A company created a product, ADAPT™, which reconciled different OLAP models to one standard model, but ADAPT™ is a proprietary model (http://www.symcorp.com/downloads/ADAPT_white_paper.pdf)
- Cube rigidity
- Limited computation support, mainly roll ups; does not support other common types of computation-type relations such as a roll forward (changes between two periods), adjustment (difference between an originally stated and restated amount), variance (difference between two reporting scenarios)
- Limited business rule support and inability to exchange business rules between implementations

- Inability to transfer cubes between systems, each system is a "silo" which cannot communicate with other silos
- Inability to articulate metadata which can be shared between OLAP systems, for example standard dimensions or members used across many systems
- Focus on numeric-type information and inconsistent support for text data types
- OLAP systems tend to be internally focused within an organization and do not work well externally, for example across a supply chain
- OLAP tends to be read only

NOLAP overcomes these limitations of OLAP.