1.   Introduction

The general purpose financial report is getting a face lift, being updated for the 21st century. 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[1]. The following is a brief explanation of CAD, commuter aided design[2]:

> 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.

In addition, in CAD/CAM software machine-readable architectural objects maintain dynamic links with construction documents and specifications, resulting in more

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

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

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.[3] Today, less reliable humans are used to remove ambiguity. Research of a domain of knowledge, such as the FASB Accounting Standards Codification (ASC)[4], can be made easier and more reliable leveraging machine-readable semantic information. Both text-based search but even more compelling is semantic-oriented search[5].

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[6].

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*[7] 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;

- Automated Report Assembly;

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[3] 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

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

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

[6] 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

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

- 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[8].

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

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[8] 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[9] those XBRL-based digital financial reports helps one understand digital financial reporting. I have published most of my analysis on my blog[10].

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*[11].

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[9] 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

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

[11] *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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