Good Practices Model for Implementing XBRL-based Reporting System

Practical, good practices-based guidance for implementing an XBRL-based reporting system where those reporting within the system are permitted to modify the report model and the need for quality is high

By

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"If I had asked people what they wanted, they would have said faster horses."   Henry Ford

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Introduction

The purpose of this document is to provide a good practices-based model for implementing an XBRL-based reporting system where those reporting within the system are permitted to modify the report model of information being reported and the quality of the information collected must be high.

This good practices-based model is grounded in over 20 years of experience with XBRL[1], a background of being an auditor, and the "poking and prodding" of existing systems which attempted to implement such systems to understand where those systems were succeeding and where they came up short in meeting the needs of regulators that implemented such systems.

While most people tend to look at those specifying financial reporting schemes, those creating financial reports, and those analyzing information from those reports as separate silos; I strive to look at this exchange of complex financial information as a system. Further, that system needs to work effectively in order to be useful.

The *Data Point Methodology*[2] is an ISO standard which leverages the global standard XBRL syntax and is appropriate when representing information using a *standardized forms approach.* This approach is appropriate in certain specific situations.

The good practices model I will describe, which is based on the *Seattle Method*[3], is used when a *customizable reporting approach* is permitted.

The difference between these two reporting approaches will be explained later in this document.

To help the reader understand the difference between a standardized forms approach and what we are trying to achieve using a customizable reporting approach it is important to understand the objectives of the system.

1.1. *Principles and Objectives*

Principles help you think about something thoroughly and consistently. Overcoming disagreements between stakeholders and even within

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[1] Charles Hoffman, CPA, *XBRL Projects Resume*,
http://www.xbrlsite.com/2022/library/Resume-2022-12-01_XBRLProjects.pdf

[2] ISO, *ISO 5116-1:2021 Improving transparency in financial and business reporting — Harmonization topics — Part 1: European data point methodology for supervisory reporting*, https://www.iso.org/standard/80873.html

[3] Charles Hoffman, CPA, *Seattle Method*, http://xbrlsite.com/seattlemethod/SeattleMethod.pdf

groups of stakeholders of a system is important. Agreement between stakeholder groups and within stakeholder groups contributes to system harmony. Lack of agreement contributes to dissonance. Principles help in the communications process and tend to help maximize harmony, minimizing dissonance.

A stakeholder is anyone that has a vested interest in a system. Another term for stakeholder is constituent. A constituent is a component part of a system.

Foundational to arriving at harmony is having a common conceptual framework including a set of consistent principles or assumptions or world view for thinking about the system. For example, accounting and financial reporting have such a conceptual framework including principles/assumptions such as "materiality" and "going concern" and "conservatism".

This "framework for agreeing" helps the communications process which increases harmony and decreases dissonance of the system. This is about bringing the system into balance, consciously creating the appropriate equilibrium/balance.

A system enables a community of stakeholders trying to achieve a specific goal or objective or a range of goals/objectives to agree on important common models, structures, and statements for capturing meaning or representing a shared understanding of and knowledge in some area of knowledge (a.k.a. universe of discourse, area of interest). A system can be explained using a theory.

A theory enables a community of stakeholders trying to achieve a specific goal or objective or a range of goals/objectives to agree on important details related to that system. A theory describes a system in the form of logical statements about that system.

The principles and objectives relating to such a specific system should be clear to all stakeholders of the system.

1.2. Need for Clarity

One key aspect of a reporting system is the reporting scheme used by the reporting system. For the type of system we are concerned with for our good practices based model; reporting schemes tend to be financial reporting schemes.

A financial reporting scheme represented digitally using an XBRL taxonomy which is then used to represent a report model for a report created by an economic entity in machine readable form serves multiple

purposes and must serve all system stakeholders. The purposes tend to be:

- **Description**: The financial reporting scheme should be clearly described. That description must be clear and should be a complete description of a report model (specification of what is permitted in a report); created by standards setters or regulators or anyone else specifying a report. Obviously, that clear and complete description should represent accounting and reporting rules precisely and accurately.

- **Construction**: The financial reporting scheme should enable the construction of reports using that report model. The financial reporting scheme is a guide to the creation of a report based on that permitted report model description whereby a human can be assisted by software applications utilizing that machine readable description of permitted report models.

- **Verification**: The report model created can be verified against the prescribed financial reporting scheme. The actual report constructed can be verified against the clear, complete description assisted by software applications utilizing that machine readable version of that description.

- **Extraction**: Report information can be effectively and reliably extracted from the provided report and report model. Information can be effectively extracted from machine readable reports and report models assisted by software utilizing that machine readable clear and complete description.

None of these purposes will be satisfied "auto-magically". Rather, the creators of the system must carefully and clearly prove to themselves that the purposes are being satisfied and that the needs of each system stakeholder or group of stakeholders are being met, that system harmony is maximized, that system dissonance is minimized, and that the principles and objectives are being met by the system that has been created to satisfy the system stakeholders.

Such a system that meets the goals and objectives of system stakeholders is thus useful to those stakeholders.

1.3. Compliance Maturity Model

A good practices based financial reporting system can, and should, fit into the *Compliance Maturity Model*[4] which is an application of the *Capabilities Maturity Model*[5]. Using the *Seattle Method* is a conscious and deliberate choice which is intended to raise the functionality level of the reporting system from lower levels of the Compliance Maturity Model to a higher level of a "process" (level 2) or "system" (level 3) and ultimately as the system matures to that of a "program" (level 4) and ultimately to "effective" (level 5) through measurement and feedback.
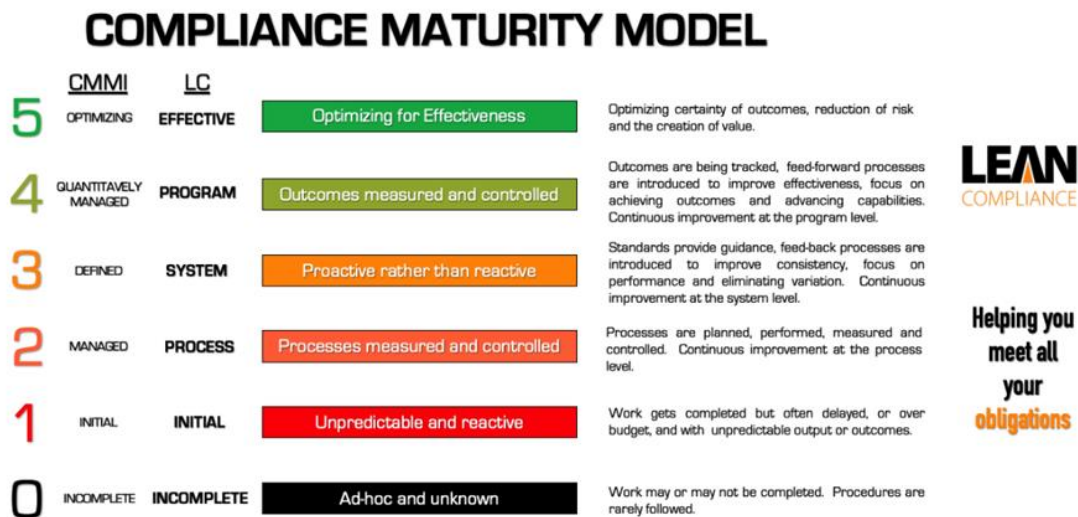
A kluge is a term from the engineering and computer science world, it refers to something that is convoluted and messy but gets the job done. Anyone can create something that is complex, convoluted, and messy. Anyone can create a kludge. But it is hard work to create something that is simple and elegant.

If a system that is created rises to the level of being simple and elegant, considering the entirety of the system and needs of all system stakeholders rather than a collection of individual silos with perhaps one dominant silo that are then perhaps then interconnected; then something quite useful might be the result.

The benefits of such a simple and elegant system to system stakeholders can be profound.

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[4] LinkedIn, Raimund Laqua, PMP, Peng, *Compliance Maturity Model*, https://www.linkedin.com/pulse/capabilities-maturity-model-compliance-raimund-laqua-pmp-peng/

[5] Wikipedia, *Capabilities Maturity Model*, https://en.wikipedia.org/wiki/Capability_Maturity_Model

1.4. Automation

Automation is about removing friction, driving costs down, speeding processes up, and improving efficiency and productivity. Automation is about improving processes in order to deliver goods and services that are better for less cost.

Old technologies are making it increasingly difficult to keep up with today's fast paced financial information exchange. New technologies such as structured information, artificial intelligence, digital distributed ledgers offer significant and compelling opportunities to make accounting, reporting, auditing, and analysis tasks and processes more efficient and effective.

The change that is occurring is being packaged into many different terms or "buzzwords" that effectively tend to refer to the same thing. Here is a summary of some of those terms/buzzwords:

- MIT refers to this as **Algorithmic Business Thinking**[6]
- Carnegie Mellon University refers to this as **Computational Thinking**[7]
- Harvard University refers to this as **Regulation, the Internet Way**[8]
- Vanderbilt University refers to this as **Regulation 2.0**[9]
- The Data Coalition calls this **Smart Regulation**[10]
- Tim O'Reilly Founder and CEO O'Reilly Media Inc. calls it **Algorithmic Regulation**[11]
- Deloitte refers to this as "**The Finance Factory**" and **Digital Finance**[12]

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[6] MIT, Accelerating Digital Transformation with Algorithmic Business Thinking, https://executive.mit.edu/course/accelerating-digital-transformation-with-algorithmic-business-thinking/a056g00000URaaQAAT.html

[7] Carnegie Mellon Center for Computational Thinking, https://www.cs.cmu.edu/~CompThink/

[8] Harvard University, Regulation, the Internet Way, https://datasmart.ash.harvard.edu/news/article/white-paper-regulation-the-internet-way-660

[9] SSRN, *Regulation 2.0: The Marriage of New Governance and Lex Informatica*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2746229

[10] Smart Regulation, http://xbrl.squarespace.com/journal/2012/11/12/smart-regulation-graphic-shows-the-big-picture.html

[11] Tim O'Reilly Founder and CEO O'Reilly Media Inc., Open Data and Algorithmic Regulation, https://beyondtransparency.org/chapters/part-5/open-data-and-algorithmic-regulation/

[12] Deloitte, *Finance 2025: Digital transformation in finance*

- Robert Kugel of Ventana Research calls it "**Digital Finance**"[13]

- The government of Norway calls this "**Nordic Smart Government and Business**"[14]

- I have referred to all this as **Computational Professional Services**[15].

Other terms are also used such as "continuous accounting", "continuous reporting", "continuous auditing" and other such terms/buzzwords.

Imagine a set of high-quality knowledge graphs organized into the form of a knowledge portal[16]. Imagine that the knowledge portal is enhanced by blockchain technology. Imagine that the knowledge graphs physical syntax is based on global standards and that the information within those knowledge graphs are also based on standards.

Imagine a system that is simple and elegant to use, rather than a poorly thought-out kludge.

Now let's take a closer look at the difference between a *standardized* reporting approach versus a *customized* reporting approach in order to better understand what it takes to make a customized reporting approach work appropriately.

1.5. *Reporting Approaches*

The paper *Critical Reflection on XBRL: A "Customisable Standard" for Financial Reporting?*[17], breaks reporting into two approaches: standardized reporting and customized reporting.

I modified this breakdown slightly breaking customized reporting into two distinct approaches, "freeform customization" and "controlled customization". I then reflected the three approaches in the following

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Our eight predictions about digital technology for CFOs, https://www2.deloitte.com/us/en/pages/finance-transformation/articles/finance-digital-transformation-for-cfos.html

[13] Robert Kugel, *The Rising Expectations for Finance Analytics*, https://www.linkedin.com/pulse/rising-expectations-finance-analytics-robert-kugel/

[14] Nordic Smart Government and Business, https://nordicsmartgovernment.org/

[15] Computational Professional Services, http://www.xbrlsite.com/mastering/Part00_Chapter01.A1_ComputationalProfessionalServices.pdf

[16] Data Science Central, Kurt Cagle, *From Knowledge Graphs To Knowledge Portals*, https://www.datasciencecentral.com/from-knowledge-graphs-to-knowledge-portals/

[17] Reporting Approaches + XBRL Approaches + Implementation Approaches, http://xbrl.squarespace.com/journal/2021/12/30/reporting-approaches-xbrl-approaches-implementation-approach.html

graphic which I created which was heavily inspired by the original graphic in the referenced paper[18]:
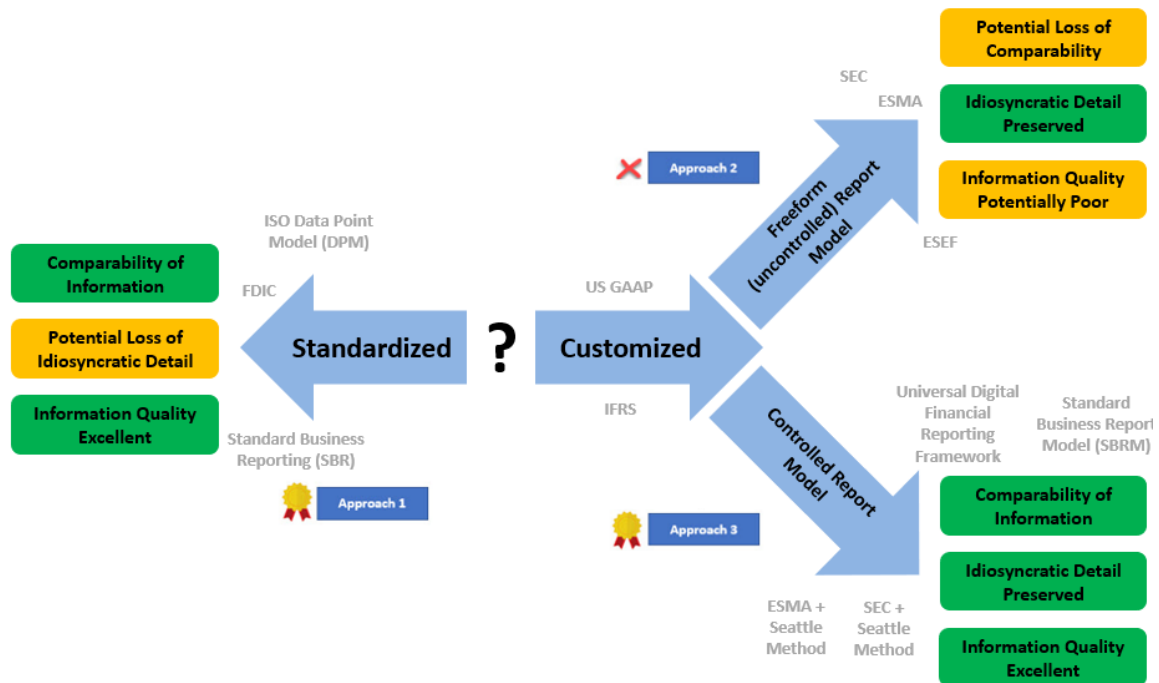
This yields three distinct reporting system modeling approaches which I summarize as follows:

- **(#1) Standard form model**: No modifications are allowed to the report model.

- Customized form model**:**

  - **(#2) Freeform, Uncontrolled customization model**: Modifications are permitted to report model, but those modifications are not controlled. As such there is no differentiation between permitted and unpermitted modifications to the model because what is permitted is not articulated with clarity.

  - **(#3) Controlled customization model**: Modifications are permitted to report model and a mechanism is provided to control report model modifications; permitted and unpermitted report model modifications are clearly delineated and control mechanisms keep report model modification within the boundaries of what is permitted.

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[18] Taxonomy creation approaches,
http://xbrlsite.azurewebsites.net/2022/library/TaxonomyApproachesSeattleMethod.jpg

Effectively, uncontrolled customization of report models simply will not work.

The ISO Data Point Methodology is a standard form model.

What the SEC and ESMA have implemented at this point is closer to freeform, uncontrolled customization model because the control mechanisms are not complete.

But if you take what the SEC and ESMA have prescribed and further constrain and control permitted modifications using the principles and techniques of the Seattle Method then you have what is closer to a controlled customization model.

If one focuses on the level of the final result of the report itself, other opportunities for automation can be missed. Think for a moment about the complete record to report process of an enterprise.

1.6. *Overcoming Other Reporting Hurdles*

An accounting information system of an enterprise can be a complex accumulation of pieces collected and created over years. Consider the following realities of such accounting and reporting systems:

- **Complex disparate systems trap information**: The reality of many if not most finance processes is many dissimilar systems making information integration complex. Often, complexity is self-inflicted such as an incorrectly set up chart of accounts or a less than adequate mapping between the chart of accounts and a report writer or audit lead schedules. *The fix?* Take the time to set up your accounting information systems correctly.

- **Missing metadata**: Far too often information necessary to flow data through a system is entered into the system at the end of a process instead of at the beginning of a process. This missing metadata makes it literally impossible to automate processes. *The fix?* Establish standard metadata, enter that metadata as early in the process as possible, enable information to flow through the process where possible.

- **Missing information**: Far too often, information necessary for a system to be automated is not available to the system and therefore information is supplemented by manually created spreadsheets. *The fix?* Bring more and more tasks and processes into core systems and avoid supplementing information using spreadsheets.

- **Overly manual process control mechanisms**: Process control mechanisms today tend to be overworked accounting professionals that have to manually control process output quality within systems that push far too much work to the end of the process. This manual approach is expensive, not reliable enough letting errors slip through the systems, and cause more important work to be delayed or simply left undone and more money needs to be spent to fix mistakes. *The fix?* Augment manual processes with automated processes and let machines help overworked humans get work done. Leverage Lean Six Sigma philosophies and techniques.

- **Communications issues**: The typical professional accountant does not really grasp the possibilities that technology offers to improve processes accurately. Computer scientists do not tend to understand important nuances of accounting, reporting, auditing, and analysis and therefore cannot build systems precisely or set priorities effectively. Most accountants focus on getting work done allocating little to no effort towards process improvement. *The fix?* It will take far less time for a professional accountant to learn what is necessary to communicate effectively with computer scientists than it would for a computer scientist to understand the important subtleties and nuances of accounting, reporting, auditing, and analysis. Take the time to improve your skills. If you don't want to make the investment, then hire a good consultant that has made that investment.

1.7. Best Practices

A best practice is a method or technique that has been generally accepted as superior to any other known alternatives because it produces results that are superior to those achieved by other means or because it has become a standard way of doing things.

A best practice (a.k.a. good practices) based method that I am calling the *Seattle Method*[19] was created in order to effectively create XBRL-based financial reports that are provably properly functioning logical systems.

Using this method, enterprises can reliably and effectively stream a high-quality machine-readable XBRL-based global standard knowledge graph of a complete, consistent, and provably correct general purpose financial statement. Further, an entire record-to-report process can be automated effectively. This method provides both the flexibility and the control necessary to effectively hit this target within an enterprise.

The next section helps the reader understand this good practices-based model.

2.   Good Practices Model Example

In this section we will provide the reader with an example of the good practices model. To the untrained observer, this example might appear to look like a toy. But to the trained observer, this example will be seen for what it actually is which is a highly sophisticated testing tool that can be used to prove the effectiveness in meeting the objectives of this system.

As a quick reminder, the overarching objective is the effective exchange of complex financial information when the creators of a report are permitted to modify (a.k.a. customize) the report model. The three sub-objectives are:

1. Effective comparability of information.
2. Preservation of idiosyncratic detail of information.
3. Excellent information quality.

Taking a lesson from Steven Covey's *The Seven Habits of Highly Effective People*, habit 2 which is "Begin with the End in Mind"; we will start at the end and work our way to the beginning. So we will start with

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[19] Charles Hoffman, CPA, Seattle Method,
http://xbrlsite.com/seattlemethod/SeattleMethod.pdf

the end result which is a set of reports that has been submitted to an information repository which is then available to others that wish to extract financial information from that information repository.

2.1. Repository of XBRL-based Reports

Below you see a screen shot of a repository of XBRL-based reports that have been created using the *Seattle Method*[20]. Each of the reports use the same financial reporting scheme and were verified against the same eight verification criteria successfully.

[CSH: Note that I need to create a better example that adds the capability to see a cross period comparison for one reporting entity and a cross entity comparison for a specific period. Further, it would be better if the PROOF was used in order to better demonstrate all of the information patterns even though that is not necessary to prove that the system works effectively.]

The point here is to show two dynamics.

First, each report provided in the repository is proven to be a properly functioning logical system. Therefore, the information in the report is guaranteed to be consistent, complete, and precise.

Second, specific complexities are provided within the set of three reports in order to demonstrate the realities of extracting information from such reports.

To understand the repository of financial reports we will first help the reader understand what can go wrong when creating such report and how to prevent the impediments to a properly functioning financial report.

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[20] *Report Repository Good Practices Prototype*,
http://www.xbrlsite.com/seattlemethod/golden/reports/repository/Dashboard.html

2.2. *Impediments to a Properly Functioning Financial Report*

The first step in being able to effectively extract information from an XBRL-based financial reports is to create properly functioning financial reports. The best way to explain how to create properly functioning financial reports is to show the reader what can go wrong within such reports.

To demonstrate what can go wrong in such reports all we need to do is focus on one fragment of a report and walk you through everything that can go wrong when representing that specific fragment. What can go wrong with the other report fragments is similar, there are patterns of impediments.

Then, the task of those creating financial reports that would ultimately end up in such a repository of XBRL-based financial reports is simply to prevent each of the impediments from occurring. The result of preventing each of the impediments from existing is a properly functioning financial report.

To provide examples of impediments to a properly functioning financial report, a well understood report fragment will be used: the accounting equation.

An explanation of[21] and examples of testing[22] for each of these impediments is available and beyond the scope of our discussion here and readers are encouraged to explore this information for a comprehensive explanation of the impediments.

The following list provides a summary from that explanation and testing:

- **State 1**: Baseline. Example of a properly functioning financial report.

- **State 2**: Leaving out a rule of report model, "Assets = Liabilities + Equity".

- **State 3**: An error in a reported fact.

- **State 4**: Unreported line item without providing a derivation rule to derive missing high-level report line item.

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[21] Understanding What Can Go Wrong,
http://www.xbrlsite.com/seattlemethod/golden/reports/ae/UnderstandingWhatCanGoWrong.pdf

[22] Testing impediments,
http://www.xbrlsite.com/seattlemethod/golden/reports/ae/Testing_Impediments.pdf

- **State 4'**: Unreported line item but with derivation rule included which uses deductive reasoning to derive unreported line item.

- **State 5**: Unreported line item and consistency rule not provided.

- **State 6**: Fact reported incorrectly, rule provided is incorrect, verification results are incorrect because both fact and rule are incorrect.

- **State 7**: Fact reported using extension concept but extension is not "anchored" to existing known concept.

- **State 7'**: Fact reported using extension concept that is properly anchored to existing concept allows proper interpretation of fact.

- **State 8**: Similar to State 7 but concept used from base taxonomy (e.g. rather than extension) is not interpretable because it is not anchored to any other concept.

- **State 9**: Similar to State 7 but rather than an extension concept, an extension disclosure is not anchored to some existing disclosure.

- **State 10**: Report model is "wired together" illogically.

- **State 11**: Report physical technical syntax is inconsistent with the XBRL technical specification.

The essence of what is being said here is that (a) all of the fragments of every report in the repository is properly functioning and (b) everything that could go wrong is represented by the set of impediments that is outlined.

If some impediment is missing from the list of impediments provided then (a) that impediment can be added and (b) a rule can be provided to detect the impediment.

In this way, reports can be controlled and therefore can be free from impediments that cause financial reports in a repository not to function properly.

2.3. Inherent Variability Caused by Intermediate Components

The document *Essence of Accounting*[23] has a comprehensive discussion of the notion of the inherent variability within financial reports which is caused by different intermediate components provided within financial reports.

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[23] Charles Hoffman, CPA, *Essence of Accounting*,
http://xbrlsite.azurewebsites.net/2020/Library/EssenceOfAccounting.pdf

Three examples will help the reader understand these ideas.

First, by intermediate components think of subtotals and totals that are used to describe information in financial reports. A financial report may, or may not, include the line item "Gross Profit (Loss)" depending on the reporting practices of specific industries or the policies of a specific reporting economic entity.

Second, while every reporting entity which provides a classified balance sheet has the notion of "Noncurrent assets" it is often the practice of reporting entities to not explicitly provide that line item within a financial report. Other reporting entities might explicitly report that line item.

Third, while the accounting equation of a for-profit entity might be "Assets = Liabilities + Equity"; other reporting entities might use a different version of the accounting equation such as "Net Assets = Assets – Liabilities".

Providing for the variability of just these three contributors to report variability help the reader understand the dynamics of reporting financial information and also the extraction of information from such financial reports. Consider the following graphic:

The graphic shows three reports, one report in each row: Report #1, Report #2, Report #3. Each report has three fragments shown in each column of the above graphic: Balance Sheet, Income Statement, and Changes in Equity. Close scrutiny of the three reports shows:

- Reports #1 and #3 use the same balance sheet format but Report #2 has a different balance sheet format.

- Each report uses a different income statement total and/or set of line items that make up the income statement total.

- Reports #1 and #3 use the same changes in equity format but Report #2 has a different changes in equity format.

These intermediate components and the inherent variability cause additional steps to be necessary when attempting to extract information from such financial reports.

Please note that this inherent variability and intermediate components is a feature of financial reports, this is not a bug. It is the inherent variability and intermediate components that enable reporting economic entities to articulate their unique idiosyncratic details effectively and one of the more powerful but misunderstood features of XBRL-based financial reporting.

2.4. Effective Extraction of Report Information

The cornerstone of this good practices model is the ability to see that the overarching objective and the three subobjectives can be effectively realized.

In this section I will show you a very simple Excel spreadsheet that is used to extract information from the three XBRL-based financial reports that exist in this model repository and help you understand the realities of effectively extracting such information.

You can download the Excel application and examine the VBA code to see exactly how the application works[24].

As you examine this very basic Excel application for this good practices model repository, consider that, say, US GAAP financial reports are more complicated but follow exactly the same pattern as this very basic model. I have provided other Excel extraction tools that pull information

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24 *Documentation*,
http://www.xbrlsite.com/seattlemethod/golden/reports/repository/Documentation.zip

from actual XBRL-based reports submitted to the SEC[25]. What is special about this very basic Excel spreadsheet is that it follows the exact same pattern for extracting information; it only focuses on specific moving parts and keeps those moving parts easy to understand in order to enhance understanding of the specific issues that I wish to help the reader understand with clarity.

	General information				Balance Sheet				Income Statement					Changes in Equity		Rules			
#	Economic Entity Name	LEI	Balance Sheet Date	Income Statement Start Period (Year to Date)	Assets	Liabilities	Equity	Liabilities and Equity	Revenues	Gains	Expenses	Losses	Comprehensive Income	Investments by Owners	Distributions to Owners	BS1	BS4	IS1	Link to XBRL instance:
1	ABC Company	GH259400TOMPUOLS65Il	2019-12-31	2020-01-01	3,500	0	3,500	3,500	7,000	1,000	3,000	2,000	3,000	1,000	500	0	0	0	http://www.sbrlsite.com/seattlemethod/goldenreports/sface8/BS1-IS1/instance.xml
2	XYZ Company	GH259400TOMPUOLS65Il	2019-12-31	2020-01-01	3,500	0	3,500	3,500	2,000	1,000	3,000	0	3,000	1,000	500	0	0	0	http://www.sbrlsite.com/seattlemethod/goldenreports/sface8/BS1-IS2/instance.xml
3	ACME, Inc.	GH259400TOMPUOLS65Il	2019-12-31	2020-01-01	3,500	0	3,500	3,500	7,000	1,000	3,000	2,000	3,000	0	0	0	0	0	http://www.sbrlsite.com/seattlemethod/goldenreports/sface8/NA1-IS3/instance.xml

To help the reader see the situation that must be dealt with clearly, I will walk you through several examples of the issues that must be dealt with properly.

For the first situation, please consider the balance sheets of Report #1 and Report #2.

Report #1 has a balance sheet that contains three line items:

- Assets, Liabilities, Equity.

Report #2 also has three line items but one line item is different:

- Assets, Liabilities, Net Assets

How is this difference handled? A first thought might simply be to have an IF…THEN statement to deal with the different concepts. And that was my first approach when began working with this XBRL-based information.

However, that became increasingly complicated and to make a long story short; rather than creating a bunch of sequential code using lots of IF…THEN statements, a completely new approach was used.

The approach that I used ended up being a forward chaining engine that read declarative rules.

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[25] *Further Updated and Expanded XBRL-based Financial Report Extraction Tools*, http://xbrl.squarespace.com/journal/2018/1/11/further-updated-and-expanded-xbrl-based-financial-report-ext.html

#	Balance Sheet

Report #1

Concept	Period		
		2020-12-31	2019-12-31
Balance Sheet [Arithmetic]			
Assets		3,500	0
Liabilities		0	0
Equity		3,500	0

Report #2

Concept	Period		
		2020-12-31	2019-12-31
Net Assets [Roll Up]			
Assets		3,500	0
Liabilities		0	0
Net Assets		3,500	0

The Excel spreadsheet is really a better example of the problem rather than the ultimate solution which I cannot show you because I am not a good enough software developer to create the correct solution by myself.

But understanding what I did wrong can help understand how to address this situation correctly.

I am not going to discuss my code; you can just go look at that. But I will tell you what I did wrong and how I fixed that problem. What I did wrong was hard code rules within code:

```
'Equity
strEquity = IIf(strEquity = "NOT-FOUND", GetFactValue("sfac8:NetWorth", "Instant"), strEquity)
strEquity = IIf(strEquity = "NOT-FOUND", GetFactValue("sfac8:NetAssets", "Instant"), strEquity)
strEquity = IIf(strEquity = "NOT-FOUND", GetFactValue("sfac8:Equity", "Instant"), strEquity)
strEquity = IIf(strEquity = "NOT-FOUND", "0", strEquity)
```

A better approach is to separate the rules from the code. And that is what this good practices model does which (a) enables business

professionals to maintain the rules, (b) enables software engineers to maintain the code, and (c) provides a massive increase in flexibility in how to process the inherent variability and intermediate subtotals in financial reporting schemes such as US GAAP and IFRS.

The bottom line here is that the notion of Reporting Styles and Fundamental Accounting Concepts and Derivation Rules and Mapping Rules are all used to deal with the intermediate subtotals and inherent variability rather than ignoring the issue or using the knee jerk rection of writing a bunch of IF…THEN code.

A second example is worth mentioning because it points to an entirely new notion: the disclosure.

The income statement is the report fragment that has the most variability of the three primary financial statements (balance sheet, income statement, cash flow statement). The variability of the income statement is an order of magnitude greater than the other two primary financial statements.

Consider the three income statements in the reports of this good practices repository model. There are three reports and each report has a different income statement.

Two income statements have the same TOTAL line item, "Comprehensive Income". Two income statements have the same detailed items (Revenues, Expenses, Gains, Losses) but then add up to two different total concepts (Comprehensive Income, Changes in Net Assets).

The point here is this. What is actually going on in these examples?

1. Is this one disclosure with lots of variability, or
2. Is this different disclosures?

The answer to the question is less important than understanding that you can ask this question about any two fragments of an XBRL-based financial report.

Income Statement

Concept	Period	2020-01-01 to 2020-12-31
Comprehensive Income [Roll Up]		
Revenues		7,000
(Expenses)		(3,000)
Gains		1,000
(Losses)		(2,000)
Comprehensive Income		3,000

Concept	Period	2020-01-01 to 2020-12-31
Changes in Net Assets [Roll Up]		
Revenues		7,000
(Expenses)		(3,000)
Gains		1,000
(Losses)		(2,000)
Change in Net Assets		3,000

Concept	Period	2020-01-01 to 2020-12-31
Comprehensive Income [Roll Up]		
Income from Normal Activities of Entity		2,000
Income from Peripheral or Incidental Transactions of Entity		1,000
Comprehensive Income		3,000

What is important is to understand that there are patterns in reports and those patterns can be leveraged. Rather than simply looking at the fragments that are being disclosed as separate things, if you give the things names and if you can worked with those named things, in this case I call them disclosures, you can work with financial reports in powerful new ways.

This leads to the notion of the disclosure mechanics rule and the reporting checklist rule.

2.5. Type-subtype (Anchoring and Wider-Narrower)

The ESMA introduced the notion of "anchoring" and the SEC introduced the notion of "wider-narrower" associations. These are not new ideas. The "general-special" relation in XBRL is similar, as is the general notion of "type-subtype". For the purpose of this good practices model I am using the term "type-subtype" and this idea is used to understand two very important notions:

1. Everything a type of some other thing.
2. Never use something that is intended to be one specific type of thing as some other thing.

Looking at the three report fragments (Balance Sheet, Income Statement, Changes in Equity); you can see how these two notions are applied:

#	Balance Sheet			Income Statement		Changes in Equity	
	Concept	**Period** 2020-12-31	2019-12-31	**Concept**	**Period** 2020-01-01 to 2020-12-31	**Concept**	**Period** 2020-01-01 to 2020-12-31
Report #1	Balance Sheet [Arithmetic]			Comprehensive Income [Roll Up]		Changes in Equity [Roll Forward]	
	Assets	3,500	0	Revenues	7,000	Equity, Beginning Balance	0
	Liabilities	0	0	(Expenses)	(3,000)	Comprehensive Income	3,000
	Equity	3,500	0	Gains	1,000	Investments by Owners	1,000
				(Losses)	(2,000)	(Distributions to Owners)	(500)
				Comprehensive Income	3,000	Equity, Ending Balance	3,500

The three fragments communicate the following things:

- Thing
    - Assets
    - Liabilities
    - Equity
    - Revenues
    - Expenses
    - Gains
    - Losses
    - Comprehensive Income
    - Investments by Owners
    - Distributions to Owners

While not articulated explicitly, you can see and your understanding of accounting might help you understand that the thing "Revenues" is

intended to be used on the Income statement, and not on the Balance Sheet or the Changes in Equity. There are many, many different associations that are permitted or which describe the proper use of the ten "things" defined above. Here is one explicit representation:
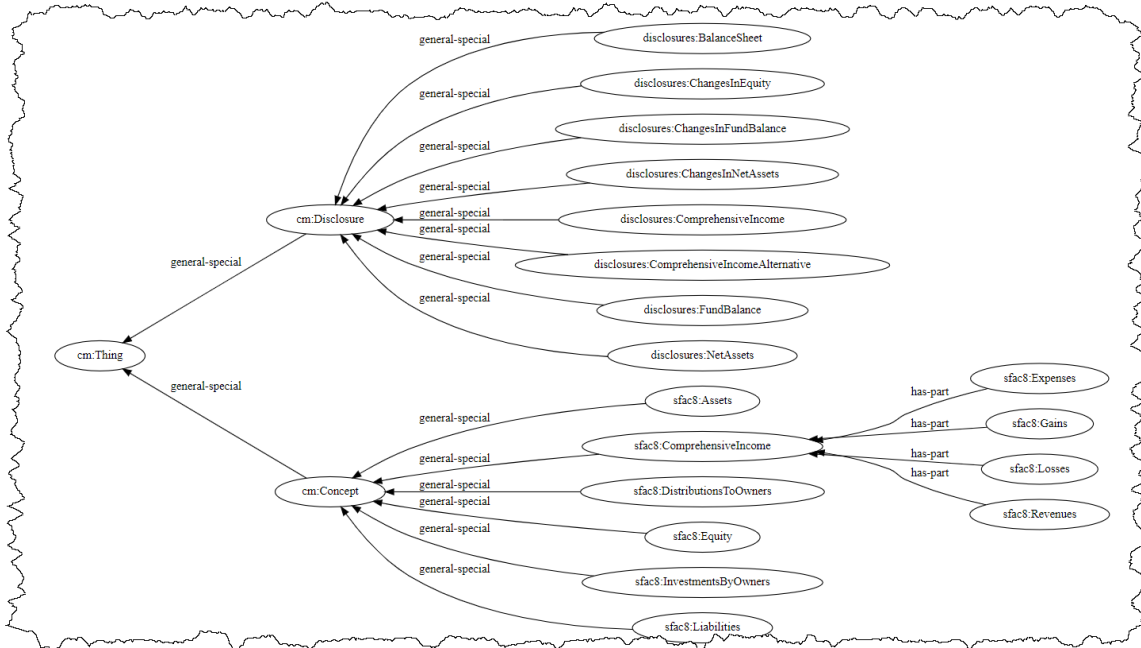
The point is that these "type-subtype" associations can be clearly and explicitly articulated and such information contributes to clarity.

3. Summary of Good Practices Model

We first explained why we need to articulate a good practices model for representing XBRL-based financial reports. We then provided a very basic example of such a good practices model in as simple a form as possible. In this section we provide a succinct summary of a good practices model.

3.1. Verification Categories (fundamentally necessary)

While the potential for categories of verification of an XBRL-based report is essentially endless, the following verification categories are necessary in order to create effective XBRL-based financial reports:

1. Proper physical XBRL technical syntax format used to represent logic

2. Proper mathematical associations between reported facts

3. Proper XBRL presentation relations associations (i.e. proper report model structure)

4. Proper use of a type or subtype of line item to represent report model

5. Consistent high-level reported information (a.k.a. fundamental accounting concepts)

6. Proper mechanical structure of disclosures

7. Proper set of disclosures provided within report

These verification categories can be implemented in software applications slightly differently. These verification categories are the very minimum of what must be used to create a properly functioning financial report. Additional verification categories can be added to supplement this fundamentally necessary set of verification categories.

Below are several implementations if these verification categories in a number of different software applications:

Auditchain:

#	Verification Category	Result
1	XBRL Technical Syntax Verification	
2	Report Mathematical Computations Verification (XBRL Calculations)	
3	Report Mathematical Computations Verification (XBRL Formulas)	
4	Report Model Structure Verification	
5	Fundamental Accounting Concept Consistency Crosschecks Verification	
6	Type-subtype (wider-narrower) Associations Verification	
7	Disclosure Mechanics Verification	
8	Report Disclosure Checklist Verification	
9	Other	

Pesseract:
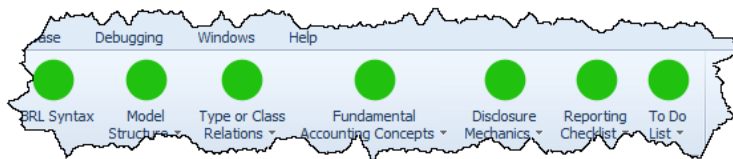
XBRL Cloud:

Verification Summary	A	M
XBRL Technical Syntax Rules	Ok	OK
Model Structure Rules	Ok	OK
Business Rules	Ok	Ok
Roll Up Rules	Ok	Ok
Other Manual Review Tasks	NS	NS
Other Rules and Best Practice Tasks	OK	Ok

4. Good Practices Repository for PROOF

The good practices repository for PROOF expands slightly on the prior example, providing 10 reports rather than the three reports in the SFAC 8 model repository of XBRL based reports[26].

Each report in the PROOF repository is consistent with each eight categories of rules which are used to verify that the information within each report is consistent with expectations and that the reports are properly functioning logical systems.

An extraction tool is provided (see the documentation) which helps the reader understand the basics of extracting information from reports contained in this repository example.

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[26] Report Repository Good Practices Prototype (PROOF),
http://www.xbrlsite.com/seattlemethod/golden/repository/dashboard.html

5. Comparison with SEC and ESMA Repositories

The following is a comparison of the good practices XBRL report repository with the SEC XBRL-based report repository and the ESMA XBRL-based report repository:

	Good Practices XBRL Report Repository	SEC XBRL-based Reports Repository	ESMA XBRL-based Reports Repository
Machine readable list of reports available in repository.	http://www.xbrlsite.com/seattlemethod/golden/reports/repository/rss.xml	https://www.sec.gov/Archives/edgar/monthly/	https://filings.xbrl.org/index.json
Machine readable **list of reporting styles used** by economic entities submitting reports.	http://www.xbrlsite.com/seattlemethod/golden/sfac8/fac/reporting-styles-cm-ref.xml	Not provided	Not provided
Machine readable **list of permitted type-subtype associations** (a.k.a. wider-narrower) which must be followed.	http://www.xbrlsite.com/seattlemethod/golden/sfac8/typeSubtype-rules-def.xml	Not provided	Not provided
Machine readable **list of disclosures** in reports.	http://www.xbrlsite.com/seattlemethod/golden/sfac8/disclosures.xsd	Not provided	Not provided
Machine readable **list of high-level fundamental accounting concepts and relations between concepts** continuity cross checks which must be followed by reports.	http://www.xbrlsite.com/seattlemethod/golden/sfac8/fac/fac.xsd	Not provided	Not provided
Machine readable **rules which must be followed by each disclosure represented** in a report.	http://www.xbrlsite.com/seattlemethod/golden/sfac8/dm.xsd	Not provided	Not provided
Machine readable **rules which must be followed by each report model created** by reporting economic entity.	http://xbrlsite.com/seattlemethod/cm/model-structure-rules-strict-def.xml	Not provided	Not provided

The document *Testing of Fundamental Accounting Concepts Consistency Crosscheck Rules*[27] provides several subsets of XBRL-based reports that have been submitted to the SEC. These subsets have only been tested against the fundamental accounting concepts rules which is only ONE of EIGHT verification categories of the good practices repository. But this will give you an idea of what is possible.

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[27] Charles Hoffman, CPA, *Testing of Fundamental Accounting Concepts Consistency Crosscheck Rules*, http://www.xbrlsite.com/2022/library/TestingFAC.pdf

6. Technical

The following is specific technical information related to this good practices model of an XBRL-based information collection system.

6.1. Repository Dashboard

Reports that are submitted to a system are shown here. Provides all of the technical artifacts.

http://www.xbrlsite.com/seattlemethod/golden/reports/repository/Dashboard.html

6.2. Reporting Scheme (Base XBRL Taxonomy)

Base XBRL taxonomy, used by the system, all supplemental rules can be obtained from this web page, see the top of the page:

http://www.xbrlsite.com/seattlemethod/golden/sfac8/sfac8_ModelStructure.html

Line		Report Element Category	Period Type	Balance	Report Element Name
1	11-Statement of Financial Position	Network			http://xbrlsite.com/seattlemethod/sfac8/role/BalanceSheet
2	Balance Sheet [Hypercube]	Table			sfac8:BalanceSheetHypercube
3	Balance Sheet [Line Items]	LineItems			sfac8:BalanceSheetLineItems
4	Balance Sheet [Arithmetic]	Abstract			sfac8:BalanceSheetArithmetic
5	Assets	Concept (Monetary)	As Of	Debit	sfac8:Assets
6	Liabilities	Concept (Monetary)	As Of	Credit	sfac8:Liabilities
7	Equity	Concept (Monetary)	As Of	Credit	sfac8:Equity
8	12-Statement of Net Assets	Network			http://xbrlsite.com/seattlemethod/sfac8/role/NetAssets
9	Fund Balance [Hypercube]	Table			sfac8:FundBalanceHypercube
10	Fund Balance [Line Items]	LineItems			sfac8:FundBalanceLineItems
11	Net Assets [Roll Up]	Abstract			sfac8:NetAssetsRollUp
12	Assets	Concept (Monetary)	As Of	Debit	sfac8:Assets
13	(Liabilities)	Concept (Monetary)	As Of	Credit	sfac8:Liabilities
14	Net Assets	Concept (Monetary)	As Of	Debit	sfac8:NetAssets
15	Fund Balance [Roll Up]	Abstract			sfac8:FundBalanceRollUp
16	Fund Balance, With Donor Restrictions	Concept (Monetary)	As Of	Credit	sfac8:FundBalanceWithDonorRestrictions
17	Fund Balance, Without Donor Restrictions	Concept (Monetary)	As Of	Credit	sfac8:FundBalanceWithoutDonorRestrictions
18	Fund Balance	Concept (Monetary)	As Of	Credit	sfac8:FundBalance
19	21-Statement of Comprehensive Income	Network			http://xbrlsite.com/seattlemethod/sfac8/role/ComprehensiveIr
20	Comprehensive Income Statement [Hypercube]	Table			sfac8:ComprehensiveIncomeStatementHypercube
21	Comprehensive Income Statement [Line Items]	LineItems			sfac8:ComprehensiveIncomeStatementLineItems
22	Comprehensive Income [Roll Up]	Abstract			sfac8:ComprehensiveIncomeRollUp
23	Revenues	Concept (Monetary)	For Period	Credit	sfac8:Revenues
24	(Expenses)	Concept (Monetary)	For Period	Debit	sfac8:Expenses
25	Gains	Concept (Monetary)	For Period	Credit	sfac8:Gains
26	(Losses)	Concept (Monetary)	For Period	Debit	sfac8:Losses

6.3. Extraction Tool

This is an extremely basic Excel software application that enables information to be extracted from reports in the repository. Purpose is to communicate basic ideas.

http://www.xbrlsite.com/seattlemethod/golden/reports/repository/Documentation.zip

#	General Information					Balance Sheet				Income Statement				Changes in Equity			Rules		
	Economic Entity Name	Identifier	Balance Sheet Date	Income Statement Period Start (Year to Date)	Assets	Liabilities	Equity	Liabilities and Equity	Revenues	Gains	Expenses	Losses	Comprehensive Income	Investments by Owners	Distributions to Owners	BS1	BS4	IS1
1	ABC Company	ENTITY001	2019-12-31	2020-01-01	3,500	0	3,500	3,500	7,000	1,000	3,000	2,000	3,000	1,000	500	0	0	
2	XYZ Company	ENTITY002	2019-12-31	2020-01-01	3,500	0	3,500	3,500	2,000	1,000	0	0	3,000	1,000	500	0	0	
3	ACME, Inc.	ENTITY003	2019-12-31	2020-01-01	3,500	0	3,500	3,500	7,000	1,000	3,000	2,000	3,000	500	0	0	0	0

6.4. Learning More about XBRL

Any other documentation that might be helpful is generally provided in this set of links or within the documents provided at this link:

http://xbrl.squarespace.com/mastering-xbrl/

6.5. Start here

Not sure where to start? Then I would suggest starting here:

http://xbrl.squarespace.com/journal/2022/4/4/the-end-start-here.html