

# Evolution of a System

## Framework for predicting changes to financial accounting, reporting, auditing, and analysis

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(February 21, 2022) DRAFT

It is getting riskier and riskier to not have a sound strategy that can be used to respond to the transformational changes impacting financial accounting, reporting, auditing, and analysis.

As was pointed out in my document *The Great Transmutation*<sup>1</sup>, we are in the midst of a change that will impact the world of financial accounting, reporting, auditing, and analysis in profound, fundamental and very likely in mostly positive ways. But what exactly will change? When will the changes occur? How can we predict what will be impacted and to what extent? What is necessary for the change to occur?

I ran across a graphic, *Stages of Evolution of a Work System*<sup>2</sup>, when I was learning about Wardley Maps. Here is that graphic:

Stage of Evolution		I	II	III	IV
x-axis labels (types of capital)	Activity (used)	Genesis	Custom	Product (+rental)	Commodity (+utility)
	Data (implied)	Unmodelled	Divergent	Convergent	Modelled
	Practice (implied)	Novel	Emerging	Good	Best
	Knowledge (implied)	Concept	Hypothesis	Theory	Universally Accepted
Characteristics					
	Ubiquity	Rare	Slowly increasing	Rapidly increasing	Widespread in the applicable market / ecosystem
	Certainty	Poorly understood / exploring the unknown	Rapid increases in learning / discovery becomes refining	Rapid increases in use / increasing fit for purpose	Commonly understood (in terms of use)
	Publication Types	Describe the wonder of the thing / the discovery of some marvel / a new land / an unknown frontier	Focused on build / construct / awareness and learning / many models of explanation / no accepted forms / a wild west.	Maintenance / operations / installation / comparison between competing forms / feature analysis e.g. merits of one model over another	Focused on use / increasingly accepted, almost invisible component
General Properties					
	Market	Undefined market	Forming market / an array of competing forms and different models of understanding	Growing market / consolidation to a few competing but more accepted forms.	Mature market / stabilised to an accepted form
	Knowledge management	Uncertain	Learning on use / focused on testing prediction	Learning on operation / using prediction / verification	known / accepted
	Market (Ecosystem) Perception	Chaotic (non linear) / Domain of the "crazy"	Domain of "experts"	Increasing expectation of use / Domain of "professionals"	Ordered (appearance of being linear) / trivial / formula to be applied
	User perception	Different / confusing / exciting / surprising / dangerous	Leading edge / emerging / uncertainty over results	Increasingly common / disappointed if not used or available / feeling left behind	Standard / expected / feeling of shock if not used
	Perception in Industry	Future source of competitive advantage / unpredictable / unknown	Seen as a competitive advantage / a differential / looking for ROI and case examples	Advantage through implementation / features / this model is better than that	Cost of doing business / accepted / specific defined models
	Focus of value	High future worth but immediate investment	Seeking ways to profit and a ROI / seeking confirmation of value	High profitability per unit / a valuable model / a feeling of understanding / focus on exploitation	High volume / reducing margin / important but invisible / an essential component of something more complex
	Understanding	Poorly understood / unpredictable	Increasing understanding / development of measures	Increasing education / constant refinement of needs / measures	Believed to be well defined / stable / measurable
	Comparison	Constantly changing / a differential / unstable	Learning from others / testing the water / some evidential support	Competing models / feature difference / evidential support	Essential / any advantage is operational / accepted norm
	Failure	High / tolerated / assumed to be wrong	Moderate / unsurprising if wrong but disappointed	Not tolerated / focus on constant improvement / assumed to be in the right direction / resistance to changing the model	Surprised by failure / focus on operational efficiency
	Market action	Gambling / driven by gut	Exploring a "found" value	Market analysis / listening to customers	Metric driven / build what is
	Efficiency	Reducing the cost of change (experimentation)	Reducing cost of waste (Learning)	Reducing cost of waste (Learning)	Reducing cost of deviation (Volume)
	Decision Drivers	Heritage / culture	Analysis & synthesis	Analysis & synthesis	Previous experience

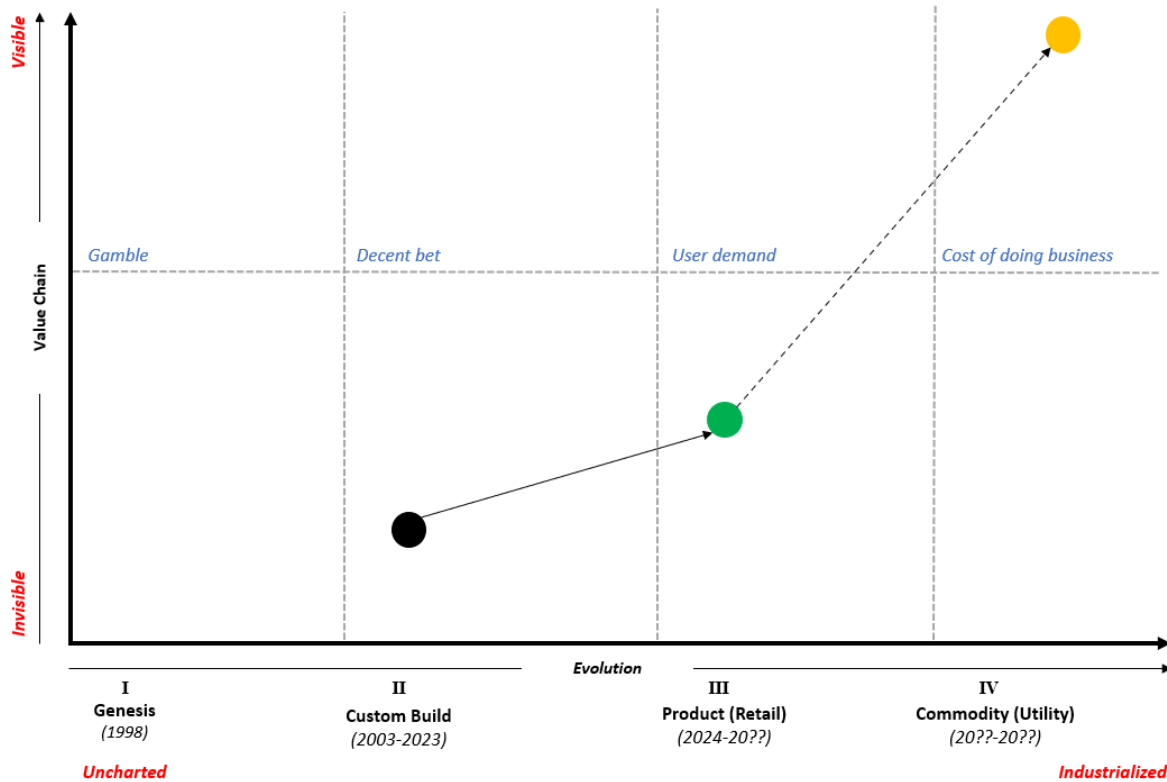
<sup>1</sup> Charles Hoffman, CPA, *The Great Transmutation of Financial Accounting, Reporting, Auditing, and Analysis*, <http://xbrlsite.azurewebsites.net/2022/Library/TheGreatTransmutation.pdf>

<sup>2</sup> Learn Wardley Mapping, *Stages of Evolution*, <https://learnwardleymapping.com/wp-content/uploads/2021/01/evolution.jpg>

A Wardley map is a tool for understanding a system. As described by the video *Wardley Mapping in 90 Seconds*<sup>3</sup>,

"A Wardley Map is a sketch. Usually of a business, market, or any other kind of work system. It is a design, maybe a blueprint. It might be right; it might be wrong. But it is something we can discuss and refine together on paper to make sure everything we do in reality is as purposeful as it can be. These designs will inevitably be put to the test by the forces of capitalism. No one is exempt; not even governments or non-profits. So, to help us cope, we acknowledge this fact up front by arranging our blueprint by evolutionary stage; from the uncharted where things are uncertain, high failure, and a gamble; to the industrialized where things are known, reliable, and standard practice. Awareness of these qualities helps us approach each part of the system deliberately. No 'one size fits all', only careful specific intention. But the map is only the beginning. Behind Wardley Mapping is a deeper strategic thinking process. There are many patterns to learn, principles to practice, and moves to make. Take it one step at a time for even the smallest insight can change everything."

Using the principles of the Wardley Map, I created this "shell" or "template" of such a map. On the map I put a BLACK dot that explains where I believe XBRL-based financial reporting is currently and a GREEN dot that shows where I think XBRL-based reporting is going in the near term. I also added a YELLOW dot to indicate where I think XBRL-based reporting will be in the longer term. This is what I came up with:



Whether I am right or wrong about my personal prediction is unimportant. What is more important is that you can use these ideas to understand where XBRL-based digital financial reporting is going for yourself using this framework. The framework can help you think through the details. Then, you can plan your personal strategic response to these changes over the coming years as you see fit.

<sup>3</sup> YouTube.com, *Wardley Mapping in 90 Seconds*, <https://youtu.be/9jvMiq4CZJ0>

What I am going to do is walk you through the information I used to make my personal assessment of where I think XBRL-based digital financial reporting is going in the shorter term; how it got to where it is; and what is necessary in order to make the progression to the next steps.

But first, let me add one additional tool that can be helpful to you when trying to make sense of what is happening in the environment to financial accounting, reporting, auditing, and analysis and this tool is used within this Wardley Map creation process and determining which strategy you will use to respond to this transformation.

## Cynefin Framework and Sensemaking

Financial accounting, reporting, auditing, and analysis is an **area of knowledge**. Sensemaking<sup>4</sup> is the process of determining the deeper meaning or significance or essence of the collective experience for those within an area of knowledge. The *Cynefin Framework*<sup>5</sup> is a model or tool for performing sensemaking. This is a graphic that explains the *Cynefin Framework*:



**Sensemaking** is the process of determining the deeper meaning or significance or essence of the collective experience for those within an area of knowledge. Notice how the terms “**Novel**” and “**Emergent**” and “**Good**” and “**Best**” practice are used by both the *Cynefin Framework* and the *Stages of Evolution of a Work System*. I would encourage you to watch the YouTube video that is provided to better understand the *Cynefin Framework* as these ideas will be used when we explore the different stages of the evolution of a work system. First, let’s bring to the forefront of your mind what a system is.

<sup>4</sup> Sensemaking, <http://xbrl.squarespace.com/journal/2021/11/18/sensemaking.html>

<sup>5</sup> YouTube.com, *The Cynefin Framework*, <https://www.youtube.com/watch?v=N7oz366X0-8>

## System

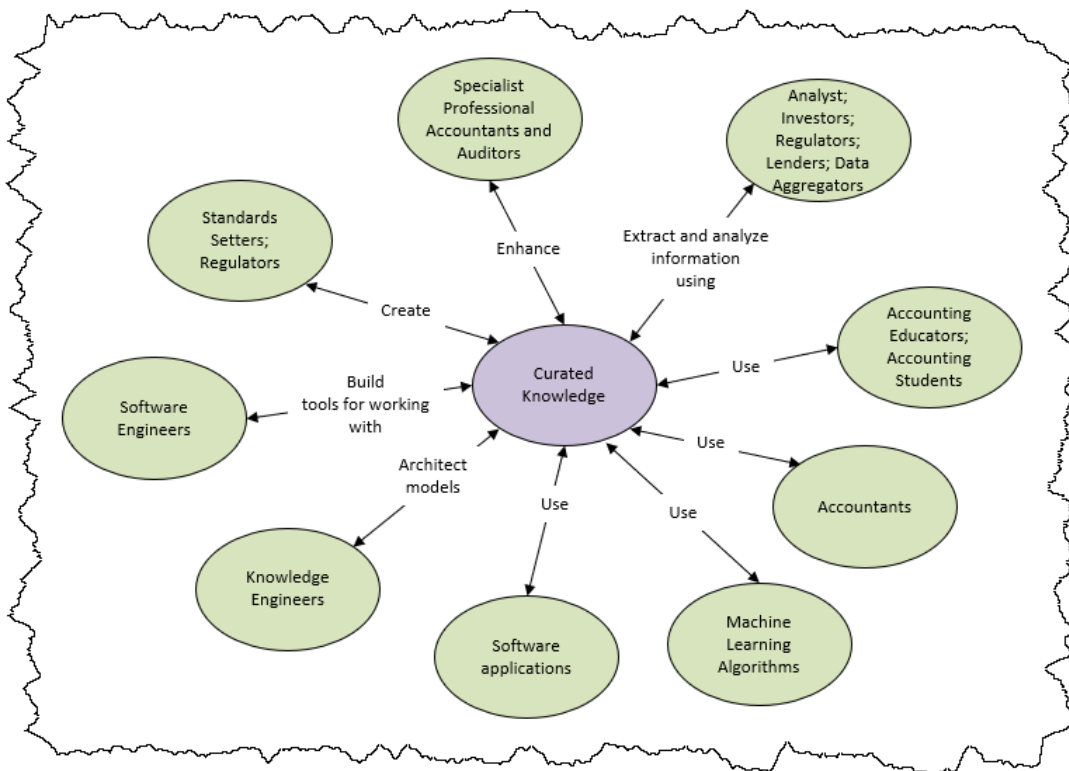
To understand systems and systems-oriented thinking, I would suggest the video, *A Theory of a System for Educators and Managers*<sup>6</sup>. A **system** is a cohesive conglomeration of interrelated and interdependent parts that is either natural or man-made. Cooperation and collaboration are key to systems; working together is the main contribution to systemic thinking as opposed to working apart separately.

As you think about how financial accounting, reporting, auditing, and analysis might change; I would invite you to look at this as a system rather than silos of individual parts. Further, applying the philosophies and techniques of *Lean Six Sigma*<sup>7</sup> would be of significant benefit.

Accounting is a process. A **kludge** (or kluge) is an engineering/computer science term that describes what is best described as a workaround or quick-and-dirty solution that is typically clumsy, inelegant, inefficient, difficult to extend and hard to maintain; but it gets the job done.

By contrast, elegance is beauty that shows unusual effectiveness and simplicity. Many accounting systems their related processes are kludges that are cobbled together over many years. Fewer accounting systems and processes are well-engineered. Accountants sometimes spend a lot of time improving the quality of things that should be destroyed. Idealized redesign is the notion of imagining what you would do to improve some process or system if you have no constraints. What would you do to improve your system if you were unconstrained? If you cannot answer that question and improve a system when unconstrained; you certainly cannot improve a system given the realities of constraints that you must generally live with.

These are the components of the system related to the area of knowledge we are working with:



<sup>6</sup> YouTube, *A Theory of a System for Educators and Managers*, <https://www.youtube.com/watch?v=2MJ3IGJ4OFo>

<sup>7</sup> *Lean Six Sigma*, [http://www.xbrlsite.com/mastering/Part01\\_Chapter02.K\\_LeanSixSigma.pdf](http://www.xbrlsite.com/mastering/Part01_Chapter02.K_LeanSixSigma.pdf)

## Stages of Evolution of a Work System

Of particular interest are the descriptions provided on that *Stages of Evolution of a Work System* graphic that I provided earlier. To begin with, consider the contrast between the aspects of the different stages: Genesis, Custom, Product, and Commodity.

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Based on my observations and actions, here is my contrast between the four different states of the evolution of XBRL-based digital financial reporting.

### Genesis (unmodeled, novel practices, concept)

XBRL had its genesis in 1998<sup>8</sup>. But accounting had its genesis about 7,000 years ago. Double entry bookkeeping is a global standard<sup>9</sup> mathematical model<sup>10</sup> which was created in 1211 and then standardized in 1494. Luca Pacioli perfected and documented the best practices used in Venice which became known as the Venetian Method of double entry bookkeeping.

But what went into those double entry bookkeeping systems were not very standard but really began to standardize in the United States in 1933/1934 when the U.S. Securities and Exchange Commission created what became US GAAP and for the rest of the world in 1975 when what became International Financial Reporting Standards (IFRS) were developed.

Another genesis occurred in about 2008 when the US GAAP XBRL Taxonomy and the IFRS XBRL Taxonomy were developed. The knowledge put into those XBRL taxonomies tended to be more about concepts. Both the US GAAP and IFRS XBRL Taxonomies tend to be even today little more than “pick lists” of concepts. They tend to be incomplete in terms of rules and associations.

Today, it is very rare that either the US GAAP or IFRS XBRL taxonomies to be referred to as a financial reporting scheme model. However, I have personally understood that those financial reporting schemes are models even though early on I did not understand the best ways to create those financial reporting scheme models as effectively as possible.

There were “off-the-shelf” products that were developed, but the products related to working with the XBRL technical syntax directly. Products such as XBRL processors were used by many projects, 213 projects<sup>11</sup> as of this writing; mainly regulator mandates to use XBRL for reporting.

There are increasing signs such as the FASB experimenting with additional XBRL arcroles and XBRL International publishing accounting related arcroles in their standard Link Role Registry (LRR)<sup>12</sup>. There

<sup>8</sup> *The Story of Our New Language*, <https://digitalfinancialreporting.blogspot.com/2022/12/the-story-of-our-new-language.html>

<sup>9</sup> *Be the Accountant that Changed the World*, <http://xbml.squarespace.com/journal/2021/10/20/be-the-accountant-who-changed-the-world.html>

<sup>10</sup> David Ellerman, *The Mathematics of Double Entry Bookkeeping*, [https://ellerman.org/wp-content/uploads/2012/12/DEB-Math-Mag.CV\\_.pdf](https://ellerman.org/wp-content/uploads/2012/12/DEB-Math-Mag.CV_.pdf)

<sup>11</sup> XBRL International, XBRL Projects Directory, <https://www.xbrl.org/the-standard/why/xbml-project-directory/>

<sup>12</sup> XBRL International, Link Role Registry, <https://specifications.xbrl.org/registries/lrr-2.0/>



are also signs that software vendors are beginning to understand the power of this accounting specific machine readable metadata. This trend will likely accelerate over the coming years.

## Custom (divergent, emerging practices, hypothesis)

While theoretically, those promoting XBRL always pointed out that the standard enabled “off-the-shelf” software to be created; software was really not interoperable at all until 2003 when XBRL International created XBRL 2.1<sup>13</sup> and an XBRL technical syntax conformance suite<sup>14</sup> that was intended to, and did, solve the technical syntax interoperability problems of XBRL software applications.

But, each implementation of XBRL by regulators tended to have its own set of software applications for creating XBRL-based reports. For example, both the FDIC and the SEC implemented XBRL for reporting of financial information; the FDIC for bank call reports (financial statements) and the SEC for public company financial information that was submitted as part of SEC filings such as 10-Ks and 10-Qs. No software vendor supported both the FDIC and SEC XBRL-based reports.

Early software supported SEC XBRL-based reports but no other XBRL taxonomies. That has changed since the ESMA began collecting information; now some software supports the creation of both ESEF reports (European Single Electronic Format<sup>15</sup>) and reports submitted to the SEC that must adhere to the Edgar Filer Manual<sup>16</sup>.

Standard Business Reporting (SBR) in Australia<sup>17</sup> and Standard Business Reporting (SBR) in the Netherlands<sup>18</sup> are custom to each SBR implementation.

There is no one, during this particular stage in the evolution of XBRL, that uses XBRL-based financial reporting because they want to; because it is “better” and/or “faster” and/or “cheaper” than some current approach.

With a few exceptions, use of XBRL tends to be custom “one off” implementations.

However, this is already changing. Because the approaches used by the SEC and ESMA are so similar, software vendors are supporting multiple base financial reporting schemes. And while technical syntax interoperability is already very good, logical interoperability of base financial reporting schemes and reports is increasing as very obvious logical issues are pointed out in the XBRL-based reports submitted to the SEC and ESMA.

The trend toward higher quality XBRL-based reports at the financial reporting logic level will continue if not increase given the pressure such as the audit requirement for XBRL-based reports by the ESMA, Committee of European Audit Oversight Bodies (CEAOB) has issued guidance, *Guidelines on audits' involvement financial statements in ESEF*<sup>19</sup>. XBRL US' Data Quality Committee<sup>20</sup> issuance of machine readable metadata in the form of rules will likely increase pressure on report quality. Finally, it is worth

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<sup>13</sup> XBRL International, Extensible Business Reporting Language (XBRL) 2.1, <https://www.xbrl.org/Specification/XBRL-2.1/REC-2003-12-31/XBRL-2.1-REC-2003-12-31+corrected-errata-2013-02-20.html>

<sup>14</sup> XBRL International, XBRL 2.1, <https://specifications.xbrl.org/work-product-index-group-base-spec-base-spec.html>

<sup>15</sup> ESMA, ESEF Reporting Manual, <https://www.esma.europa.eu/document/esef-reporting-manual>

<sup>16</sup> SEC, *Edgar Filer Manual*, <https://www.sec.gov/edgar/filermanual>

<sup>17</sup> Australian Government, SBR, <https://www.sbr.gov.au/>

<sup>18</sup> Netherlands Government, SBR, <https://www.sbr-nl.nl/english/what-is-sbr>

<sup>19</sup> CEAOB Issues Audit Guidelines for XBRL-based Financial Reports, <http://xbrl.squarespace.com/journal/2019/12/6/ceaob-issues-audit-guidelines-for-xbrl-based-financial-repor.html>

<sup>20</sup> XBRL US, Data Quality Committee, <https://xbrl.us/data-quality/center/committee/>

pointing out that the Financial Data Transparency Act of 2022 for the first time used the word “ontology” and had other wording about the need for quality in machine readable reports. This pressure on quality will increase the pace at which custom regulatory reporting software to individual regulators will evolve to become products.

## Product (convergent, good practices, theory)

But why couldn't someone just by one product that supported XBRL-based reporting to any government regulator? That would motivate software vendors to create products that had larger user bases which could do things like decrease the cost of software.

As early as 2012, I created the *Financial Report Semantics and Dynamics Theory*<sup>21</sup> which ultimately became the *Logical Theory Describing Financial Report*<sup>22</sup>.

That theory introduced the notion of “templates” and template-based creation of the disclosures<sup>23</sup> that were part of XBRL-based reports. The templates were synthesized from the 7,000 different reporting entities submitting reports to the SEC and were in essence the “good practices” or “best practices” in financial reporting.

While we have not really reached this “product” stage of the evolution of XBRL yet; that stage could be just around the corner. Auditchain is creating an expert system for creating XBRL-based financial reports<sup>24</sup>. On that blog post I provide a reference to a YouTube playlist that shows how that software application functions. You have to use your imagination a little. But that need to use imagination to understand the value of XBRL-based digital financial reporting will rapidly decrease in the coming months.

Further, pressure from the OMG Standard Business Report Model<sup>25</sup> (SBRM) and the Seattle Method<sup>26</sup> and the concern and steps to improve report quality will help turn XBRL-based digital financial reporting from a product to a commodity.

As XBRL-based reporting raises to the stage of being industrial strength, enterprise financial reporting processes will begin to see the value of digital financial reporting.

## Commodity (modeled, best practices, universally excepted)

What is really needed is industrial strength XBRL-based reports that are consistently high in quality, based on repeatable processes, where every software vendor could create fundamentally consistent and high quality XBRL-based financial reports. What is learned about applying XBRL to financial reporting will spill over into general business reporting.

XBRL International has attempted several times to provide a standard conceptualization of the logic of a business report. The most current approach is the Open Information Model 1.0<sup>27</sup>. But that approach

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<sup>21</sup> Financial Dynamics and Semantics Theory, <http://xbrl.squarespace.com/fin-report-sem-dyn-theory/>

<sup>22</sup> Charles Hoffman, CPA, *Logical Theory Describing Financial Report (Terse)*, [http://xbrlsite.com/seattlemethod/LogicalTheoryDescribingFinancialReport\\_Terse.pdf](http://xbrlsite.com/seattlemethod/LogicalTheoryDescribingFinancialReport_Terse.pdf)

<sup>23</sup> Template based disclosures, [http://xbrlsite-app.azurewebsites.net/DisclosureBestPractices\\_USGAAP/DisclosureBestPractices.aspx](http://xbrlsite-app.azurewebsites.net/DisclosureBestPractices_USGAAP/DisclosureBestPractices.aspx)

<sup>24</sup> *World's First Standards Based Expert System for Creating Financial Reports*, <https://digitalfinancialreporting.blogspot.com/2023/01/worlds-first-standards-based-expert.html>

<sup>25</sup> OMG, Standard Business Report Model (SBRM), <https://www.omg.org/intro/SBRM.pdf>

<sup>26</sup> Charles Hoffman, CPA, Seattle Method, <http://xbrlsite.com/seattlemethod/>

<sup>27</sup> XBRL International, Open Information Model, <https://specifications.xbrl.org/spec-group-index-open-information-model.html>

tends to have the incorrect focus on XBRL itself and converting XBRL syntax to a variety of other technical syntaxes; as contrast to a focus on the logic of a business report or financial report.

Two additional attempts to turn XBRL-based reports into a commodity are the **Seattle Method**<sup>28</sup> which is described as a:

“Proven, industrial strength, good practices, standards-based pragmatic approach to creating provably high quality XBRL-based general purpose financial reports that builds on the Venetian Method of double entry bookkeeping and adapting it for the information age explained in simple terms”

The other is the **Standard Business Report Model (SBRM)**<sup>29</sup>, which provides a logical conceptualization of a business report and is described by OMG as such:

“Standard Business Report Model (SBRM) is a forthcoming specification from Object Management Group® (OMG®) that builds on XBRL to further increase its usability and applicability, while retaining full interoperability. SBRM makes it easier for organizations to make use of world class standards and provide a standard approach to safely, reliably, and effectively automate information exchange.”

There are many additional use cases for XBRL-based digital general purpose financial reports<sup>30</sup>. Some are calling for a universal digital financial reporting framework<sup>31</sup>.

Ultimately, that is where the world will go. The question is when. Approaches to using XBRL such as the Seattle Method and the Standard Business Report Model might become de facto standards or more progressive software vendors might use these approaches.

While XBRL might not be a true “commodity” for many years to come; effective approaches could give the software vendors that use those industrial strength approaches an advantage in the market place.

Without a doubt, there is value to the capability to exchange complex information between the participants within the financial reporting supply chain. That was the original purpose of XBRL in its genesis. That purpose was expanded early on to general business reporting. General business reporting will very likely learn from experimentation with XBRL-based financial reporting.

This could lead to what some have referred to as the semantic spreadsheet. Imagine one global standard for a semantic spreadsheet which is logic based and its impact on use cases of the electronic spreadsheet which tends to be presentation oriented (workbooks, sheets, columns, rows, cells). The result could, potentially, be a global standard logic oriented “pivot table on steroids”.

While no one knows when or if such a semantic pivot table might ever reach the stage of being a global standard commodity; those capabilities still undoubtedly offer very useful functionality in the area of financial accounting, reporting, auditing, and analysis because of other semantic standards related to financial reporting.

These ideas, capabilities, and benefits could very likely could spill over to general business reporting.

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<sup>28</sup> Charles Hoffman, CPA, Seattle Method, <http://xbrlsite.com/seattlemethod/>

<sup>29</sup> OMG, Standard Business Report Model (SBRM), <https://www.omg.org/intro/SBRM.pdf>

<sup>30</sup> Charles Hoffman, CPA, *General Purpose Financial Reporting Support for XBRL*, <https://digitalfinancialreporting.blogspot.com/2023/02/general-purpose-financial-reporting.html>

<sup>31</sup> Charles Hoffman, CPA, *Ten Keys to Creating a Universal Digital Financial Reporting Framework*, <https://digitalfinancialreporting.blogspot.com/2023/02/ten-keys-to-creating-universal-digital.html>



## Transitioning to Industrial Strength Digital Financial Reporting

What would be best is to have one global standard, industrial strength, powerful tool for general purpose financial reporting. But what does it take to get there? This section breaks down those details.

While becoming a commodity might be best for society and is my personal preference; individual products could still benefit from these ideas as XBRL-based reporting evolves through its stages. Individual products or classes of products would benefit from these ideas in the product stage, long before the commodity stage is reached.

The law of irreducible complexity points out the following: A single system which is composed of several interacting parts that contribute to the basic function of that system and where the removal of any one of the parts of the system 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.

This section lays out, in a nontechnical a way as possible, the pieces of the puzzle that are necessary for the transition from the current state to some future state, the irreducible complexity that must exist for the evolution to take place.

## Global Standard Physical Syntax (format)

One piece that is necessary is that there be a global standard physical syntax or technical format that can be used to instantiate digital financial reports. XBRL is such a global standard technical syntax format. You can think of this as the “container” or “transport mechanism” for the financial report models and the financial information that is being reported.

Today, the XBRL technical syntax exists, its technical interoperability is extremely good between different software applications at this level. And so, XBRL can progress to the next level of interoperability<sup>32</sup>.

## Global Standard Logical Conceptualization of a Financial Report (or Business Report)

While some physical syntax is necessary, it is not sufficient. There needs to be some fundamental logical conceptualization of a financial report or “structure” so that each financial report has the same definition for what a properly functioning financial report is and how such a global standard digital financial report behaves.

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<sup>32</sup> Auditchain, *Financial Report Levels*, <http://accounting.auditchain.finance/library/FinancialReportLevels.pdf>

Think of it this way. For, say, a comparison of the “Microsoft” and “Apple” financial reports to be made there needs to be some common model, called a “metamodel” that each financial report model is consistent with. Likewise, for all other reports submitted to some specific regulator such as the SEC.

Further, of software was to work with the SEC and the ESMA XBRL-based reporting systems; the metamodel of those two systems should be consistent.

As mentioned, two existing approaches that can be used for creating these metamodels are the *Seattle Method* and the *Standard Business Report Model (SBRM)*. Note that while both SBRM and the Seattle Method support a logical model of a business report; the Seattle Method enhances the business report model further to provide a logical conceptualization of a financial report in both human readable terms<sup>33</sup> and machine-readable terms<sup>34</sup>.

You can think of this logical conceptualization as the logical container of a financial report; how such a report behaves logically. But you need some financial reporting scheme to go into that logical conceptualization.

## Standard Meaning or Financial Reporting Scheme Logic

Something, some financial information, needs to be placed within that global standard physical technical syntax (physical container) and logical container. Two robust mechanisms that exist for this that are already in place are US GAAP and IFRS financial reporting schemes, portions of which are instantiated as XBRL taxonomies.

There are plenty of other financial reporting schemes<sup>35</sup>, each is grounded in the same double entry bookkeeping mathematical model and the accounting equation.

Reporting Scheme	US GAAP issued by FASB	IFRS issued by IASB	FRF for SMEs issued by AICPA	IPASB issued by IPSASB	GAS issued by GASB	AAS issued by AASB	FAS issued by FASAB
URL	<a href="https://www.fasb.org">https://www.fasb.org</a>	<a href="https://www.ifrs.org/">https://www.ifrs.org/</a>	<a href="https://www.aicpa.org/interstatesaifrc/sectors/financialreporting/standards.html">https://www.aicpa.org/interstatesaifrc/sectors/financialreporting/standards.html</a>	<a href="https://www.ipsasb.org">https://www.ipsasb.org</a>	<a href="https://www.gasb.org">https://www.gasb.org</a>	<a href="https://www.aasb.gov.au">https://www.aasb.gov.au</a>	<a href="https://www.fasab.gov/">https://www.fasab.gov/</a>
Reporting Scheme description	United States Generally Accepted Accounting Standards	International Financial Reporting Standards	Financial Reporting Framework for Small- and Medium-Sized Entities	International Public Sector Accounting Standards	General purpose financial reporting by state and local governmental entities	Australian Accounting Standards	Federal Accounting Standards (United States)
Location of Standards	<a href="https://www.fasb.org/">https://www.fasb.org/</a> (free access, but you have to register)	<a href="https://www.ifrs.org/issued-standards/list-of-standards/">https://www.ifrs.org/issued-standards/list-of-standards/</a>	<a href="https://www.aicpa.org/content/dam/aicpa/interstatesaifrc/accounting/financialreporting/pdf/downloadabledocuments/rt-smes-frf-smes-framework.pdf">https://www.aicpa.org/content/dam/aicpa/interstatesaifrc/accounting/financialreporting/pdf/downloadabledocuments/rt-smes-frf-smes-framework.pdf</a>	<a href="http://www.ifrs.org/publications-resources/2018-handbook-international-public-sector-accounting-announcements">http://www.ifrs.org/publications-resources/2018-handbook-international-public-sector-accounting-announcements</a>	<a href="https://www.gasb.org/iss/GASB/Pages/0655SectionofPageId%3D1179160941391">https://www.gasb.org/iss/GASB/Pages/0655SectionofPageId%3D1179160941391</a>	<a href="https://www.aasb.gov.au/fr/announcements.aspx">https://www.aasb.gov.au/fr/announcements.aspx</a>	<a href="http://www.fasab.gov/standards-by-chapter">http://www.fasab.gov/standards-by-chapter</a>
Conceptual Framework	<a href="https://www.fasb.org/pdf/conceptual/">https://www.fasb.org/pdf/conceptual/</a>	<a href="https://www.ifrs.org/issued-standards/list-of-standards/conceptual-framework/">https://www.ifrs.org/issued-standards/list-of-standards/conceptual-framework/</a>	<a href="https://www.aicpa.org/content/dam/aicpa/interstatesaifrc/accounting/financialreporting/pdf/downloadabledocuments/rt-smes-frf-smes-framework.pdf">https://www.aicpa.org/content/dam/aicpa/interstatesaifrc/accounting/financialreporting/pdf/downloadabledocuments/rt-smes-frf-smes-framework.pdf</a>	<a href="https://www.ifrs.org/system/files/publications/files/A1P-IPASB-03_1.pdf">https://www.ifrs.org/system/files/publications/files/A1P-IPASB-03_1.pdf</a>	<a href="https://www.gasb.org/cs/ContentServer?cs=Content&amp;cid=1179156649588&amp;e=Page&amp;name=GASB%2FGASBContent_C%2FProjectPage">https://www.gasb.org/cs/ContentServer?cs=Content&amp;cid=1179156649588&amp;e=Page&amp;name=GASB%2FGASBContent_C%2FProjectPage</a>	<a href="https://www.aasb.gov.au/pdf/content/content/105/our-current-framework-us_19.pdf">https://www.aasb.gov.au/pdf/content/content/105/our-current-framework-us_19.pdf</a>	<a href="http://files.fasab.gov/pdf/standards-atf-1.pdf">http://files.fasab.gov/pdf/standards-atf-1.pdf</a> <a href="http://files.fasab.gov/pdf/2018-fasab-handbook.pdf">http://files.fasab.gov/pdf/2018-fasab-handbook.pdf</a>
Approximate number of reporting entities	About 10,000 public entities; 27.9 million private entities; 18,500 private companies with 500 employees or more; 320,000 not-for-profit entities	Estimated to be about 10,000 listed companies in Europe perhaps 30,000 globally; probably 25 million private small and medium (SME) entities globally	Intended for the approximately 27.9 million private companies in the US; would tend to be economic entities on the smaller side.	Unknown, estimate at least 100,000 based on state and local government numbers in US.	Estimated 90,000 state and local governmental entities in the US.	Estimated to be about 1,068,052 listed companies and private small and medium (SME) entities.	The Federal Register indicates there are over 430 departments, agencies, and sub-agencies.
Master Term:	<a href="http://xbrlsite.azurewebsites.net/2019/Concept-USGAAP/">http://xbrlsite.azurewebsites.net/2019/Concept-USGAAP/</a>	<a href="http://xbrlsite.azurewebsites.net/2019/Concept-IFRS/">http://xbrlsite.azurewebsites.net/2019/Concept-IFRS/</a>	<a href="http://xbrlsite.azurewebsites.net/2019/Concept-FRFsmes/">http://xbrlsite.azurewebsites.net/2019/Concept-FRFsmes/</a>		<a href="http://xbrlsite.azurewebsites.net/2019/Concept-GASB/">http://xbrlsite.azurewebsites.net/2019/Concept-GASB/</a>	<a href="http://xbrlsite.azurewebsites.net/2019/Concept-AASB/">http://xbrlsite.azurewebsites.net/2019/Concept-AASB/</a>	
Assets	Assets	Assets	Assets	Assets; Other Resources	Assets and Deferred Inflow of Resources	Assets	Assets
Liabilities	Liabilities	Liabilities	Liabilities	Liabilities; Other Obligations	Liabilities and Deferred Outflow of Resources	Liabilities	Liabilities
Equity or Net Assets	Equity (or Net Assets)	Equity (or Net Assets)	Equity (or Net Assets)	Net Financial Position	Net Position	Equity (or Net Assets)	Net Position
Comprehensive Income	Comprehensive Income	Income and Expenses	Net income	Surplus or Deficit	Change in Net Position	Income and Expenses	Change in Net Position (Implied)
Investments by Owners	Investments by Owners	Contributions from Holders of Equity Claims	Investments by Owners	Ownership Contributions	Increase in Net Position (Implied)	Contributions from Holders of Equity Claims	Increase in Net Position (Implied)
Distributions to Owners	Distributions to Owners	Distributions to Holders of Equity Claims	Distributions to Owners	Ownership Distributions	Decrease in Net Position (Implied)	Distributions to Holders of Equity Claims	Decrease in Net Position (Implied)
Revenues	Revenues	Revenues	Revenues	Inflow of Resources		Income	Revenues
Expenses	Expenses	Expenses	Expenses	Outflow of Resources		Expenses	Expenses
Gains	Gains	Gains	Gains				
Losses	Losses	Losses	Losses				

As pointed out elsewhere, these financial reporting schemes need to be complete in their description of the financial reporting scheme which they represent. It is this information which enables the creation of

<sup>33</sup> Charles Hoffman, CPA, Seattle Method, Resources, *Logical Conceptualization of Financial Report (Terse)*, [http://xbrlsite.com/seattlemethod/LogicalTheoryDescribingFinancialReport\\_Terse.pdf](http://xbrlsite.com/seattlemethod/LogicalTheoryDescribingFinancialReport_Terse.pdf)

<sup>34</sup> Charles Hoffman, CPA, Seattle Method, Resources, <http://xbrlsite.com/seattlemethod/resources.html>

<sup>35</sup> Elements of Financial Statement, <http://xbrlsite.azurewebsites.net/2020/master/ElementsOfFinancialStatements.pdf>

high-quality XBRL-based reports. It is to the extent that these reports are usable; it is to that extent that such financial reports will be useable.

The full extend of what is necessary to be provided within any financial reporting scheme XBRL Taxonomy is provided by the Seattle Method documentation and the levels of a financial report<sup>36</sup>. Further, prototype financial reporting schemes are provided that can be used to demonstrate why the specific machine-readable rules are necessary and what is provided by making use of those machine-readable rules.

While it, obviously, is better if the publishers of the XBRL Taxonomies such as the FASB for US GAAP and IFRS Foundation for IFRS to publish the complete set of financial reporting scheme machine-readable metadata; if the FASB and IFRS Foundation do not publish the information, third parties can supplement what the standards setters provide.

Additionally, while it could be beneficial for one single complete version of a financial reporting scheme to exist; it is highly likely that multiple versions will exist for some period of time.

And so now the logical container and physical container can be “filled”; but one needs software to process what does exist in those containers.

## Logic/Rules/Reasoning Engine

If information exists in some standard syntax, standard semantics are used, and the proper set of complete machine-readable rules is provided; it is to that extent that some software can process that information. But some software needs to actually exist to perform this task. General purpose semantic reasoners and rules engines and other such problem-solving logic tools exist; however, those tools are not approachable by business professionals.

However, these general purpose technical tools can serve as a “base” upon which some “specialized” processing functionality can be created. The “base” level general tools that exist that I find highly functional are PROLOG, DATALOG, RDF/OWL/SHACL/SPARQL, and specific graph databases that have robust rules processing capabilities such as TypeDB. And you do not necessarily need to have some sort of “engine”; you can create your own base processing layer in any number of ways.

Currently there are special purpose technical tool sets available today, by far the best being Auditchain’s Pacioli<sup>37</sup>. There is other software in addition. Others will very likely copy the ideas of these early software applications and come up with new ideas.

## Software Approachable by Business Professionals

Software for creating financial reports that saves time, saves money, or increases report quality (or all three preferably) is necessary for accounting professionals to want to make use of XBRL-based digital financial reporting.

Today, current software effectively “bolts on” additional work so that that first evolution of software in no way makes anything better, faster, or cheaper. In fact, a large portion of public companies that

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<sup>36</sup> Auditchain, *Financial Report Levels*, <http://accounting.auditchain.finance/library/FinancialReportLevels.pdf>

<sup>37</sup> Auditchain, Pacioli Logic and Rules Engine, <https://docs.auditchain.finance/auditchain-protocol/pacioli-logic-and-rules-engine>

submit XBRL-based reports to the SEC simply delegate that task to a filing agent that creates the XBRL-based report for the reporting entity (at additional cost).

Additionally, software for creating the massive number of rules (metadata) that is necessary for making XBRL-based reporting effective must also be available.

The next generation of tools for creating XBRL-based financial reports is exemplified, I believe, by the world's first expert system for creating financial reports<sup>38</sup> that I am aware of. Additional software of which I am not aware might already exist.

## Details of What Exists Today

And so, what exactly exists today? This section provides somewhat of an inventory of what exists today which is helpful in determining what might exist in the future.

## XBRL Global Standard Syntax

The XBRL technical syntax was first published in 2001 and a second version was published in 2002. But it was not until XBRL 2.1<sup>39</sup> was published in 2003 that a robust, commercial quality standard existed. Testament to the fact that the quality of XBRL 2.1 is very good is the fact that the XBRL 2.1 technical specification has not changed since 2003. Additional features of XBRL have been built out, but there has not been any change to the core XBRL 2.1 specification which is a very good sign.

## Logical Conceptualization of Financial Report

The document *Logical Conceptualization of Financial Report*<sup>40</sup> has been informally published (i.e. there is no standards organization that stands behind it, but the logical conceptualization of a financial report is implemented by four different software vendors). It would be a stretch to call this a de facto standard; but it has been proved to work effectively.

In addition, a machine-readable version of the logical conceptualization is provided by the Seattle Method<sup>41</sup>.

## Financial Reporting Schemes Provided in Machine Readable Form

There are two primary general purpose financial reporting schemes that have been represented using XBRL. Those two financial reporting schemes are: US GAAP and IFRS. There are others.

However, neither US GAAP nor IFRS nor any other financial reporting scheme can be held out as a good example of what a financial reporting scheme should look like.

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<sup>38</sup> YouTube, Playlist, *World's First Standards Based Expert System for Creating Financial Reports*, <https://www.youtube.com/playlist?list=PL80qjzvfqwtNuTekdIRyOrhaHEDIXkOh3>

<sup>39</sup> XBRL International, *XBRL 2.1*, <https://specifications.xbrl.org/work-product-index-group-base-spec-base-spec.html>

<sup>40</sup> Seattle Method, *Logical Conceptualization of Financial Report*, [http://xbrlsite.com/seattlemethod/LogicalTheoryDescribingFinancialReport\\_Terse.pdf](http://xbrlsite.com/seattlemethod/LogicalTheoryDescribingFinancialReport_Terse.pdf)

<sup>41</sup> Seattle Method, *Resources*, [xbrlsite.com/seattlemethod/resources.html](http://xbrlsite.com/seattlemethod/resources.html)

However, I have prototyped multiple financial reporting schemes as good practice examples of what a financial reporting scheme should look like<sup>42</sup>. These financial reporting schemes are used for testing financial reporting scheme modeling approaches, testing XBRL-based financial reports, testing software, and otherwise figuring out how to make XBRL-based financial reporting to work effectively. An untrained observer might look at the prototypes provided and view them as toys. However, they are not toys; rather they are precision testing tools.

## Existing Logic/Rules/Reasoning Engine

Today there are four different software vendors that support 98% of the verification tasks required by the Seattle Method. Those software vendors are:

- *XBRL Cloud*<sup>43</sup> which is a commercial cloud-based product available which supports about 98% of the Seattle Method; but only for US GAAP.
- *Pesseract*<sup>44</sup> is a working proof of concept that was created by myself and a software engineer to help us figure out XBRL-based digital financial reporting. Pesseract is more flexible and supports 100% of the properly created financial reporting scheme prototypes created; but it only supports about 98% of the rules required by the Seattle Method.
- *Pacioli*<sup>45</sup> is a cloud-based logic/rules/reasoning engine created by Auditchain. Pacioli supports 100% of the Seattle Method and 100% of the properly created prototype financial reporting schemes that I have published for testing purposes. Pacioli is not as approachable to accountants as it needs to be.
- *Luca*<sup>46</sup> is a cloud-based software application for creating XBRL-based financial report creation. Luca leverages Pacioli for batch processing of XBRL-based reports after the report has been complete. However, Luca has a library of functionality that is being built to dynamically interact with a financial report as it is being created. Luca will support 100% of the Seattle Method and 100% of the properly created prototype financial reporting schemes. Luca will work the way I would anticipate a rules/logic/reasoning should work and has the capabilities that I would expect. Luca will be where Pacioli is in terms of functionality within 6 to 8 months (say, December 2023). Luca is very approachable to accountants.

There is other software, but none of the software that I am aware of can enable the creation of a properly functioning financial report and also give the creator of the report the insight to prove to that creator that, in fact, the digital financial report is properly functioning. This might seem like a high bar. But, in fact, this is the minimum bar for software to even be considered useful for industrial strength XBRL-based digital financial reporting.

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<sup>42</sup> *General Purpose Financial Reporting Support for XBRL*, <https://digitalfinancialreporting.blogspot.com/2023/02/general-purpose-financial-reporting.html>

<sup>43</sup> XBRL Cloud, <https://www.xbrlcloud.com>

<sup>44</sup> Pesseract, <http://pesseract.azurewebsites.net/>

<sup>45</sup> Auditchain, *Pacioli Logic and Rules Engine*, <https://docs.auditchain.finance/auditchain-protocol/pacioli-logic-and-rules-engine>

<sup>46</sup> Auditchain, *Luca*, <https://dev.auditchain.finance/>

## Specific Example

This section provides a specific example of (a) a base financial reporting scheme that has been properly created, (b) a report model of an economic entity, and (c) the actual report. Three specific examples are provided to provide specific, consumable information for the reader:

- **PROOF**<sup>47</sup>: The PROOF might look like a toy to accountants, but it is actually a distillation of the essence of what would ever be provided in a base financial reporting scheme, a report model of an economic entity, and an actual report.
- **MINI**<sup>48</sup>: The MINI financial reporting scheme is the most comprehensive in that it includes a prototype of business events and classical transactions that are used to construct a complete “record to report” process.
- **AASB 1060**<sup>49</sup>: The AASB 1060 is a real financial reporting scheme of which about 20% was represented using XBRL.

With these three examples, one can get a very good idea of what it takes to provide an industrial strength XBRL-based reporting system that can be proven to work effectively. Each of the financial reporting schemes has a complete set of:

- Fundamental accounting concepts and relations that are used to test for inconsistencies, contradictions, and conflicts related to the high-level financial report line items.
- Reporting styles<sup>50</sup> that demonstrate the flexibility necessary from a financial reporting scheme
- Disclosure mechanics rules that are helpful in creating a financial reporting scheme to describe the essence of every financial disclosure and necessary to verify reports to make sure the stayed within permitted boundaries where each disclosure was created.
- Reporting checklist rules which enable a financial reporting scheme to specify when specific disclosures are required to be provided and used by software to make certain that those specified rules are complied with.
- Type-subtype (a.k.a. wider-narrower) associations which are used by a financial reporting scheme to specify precisely where specific concepts are to be used in a report and used by software to verify those rules are followed.
- Business events which specify the events for which accounting transactions might be posted to an accounting system.
- Classic transactions that specify the transaction pattern of the posting of business events, the accounts to which the business event information is posted, the balance sheet account roll forward grouping to which the transaction applies, and the financial reporting line item the chart of accounts of a financial accounting system applies to.

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<sup>47</sup> PROOF, [http://www.xbrlsite.com/seattlemethod/golden/proof/base-taxonomy/proof\\_ModelStructure.html](http://www.xbrlsite.com/seattlemethod/golden/proof/base-taxonomy/proof_ModelStructure.html)

<sup>48</sup> MINI Financial Reporting Scheme with Business Events and Classical Transactions, [http://xbrlsite.azurewebsites.net/2023/reporting-scheme/mini/base-taxonomy/mini\\_ModelStructure2.html](http://xbrlsite.azurewebsites.net/2023/reporting-scheme/mini/base-taxonomy/mini_ModelStructure2.html)

<sup>49</sup> AASB 1060, <http://xbrlsite.azurewebsites.net/2021/reporting-scheme/aasb1060/documentation/>

<sup>50</sup> Essence, [http://www.xbrlsite.com/seattlemethod/golden/essence/essence\\_ModelStructure.html](http://www.xbrlsite.com/seattlemethod/golden/essence/essence_ModelStructure.html)



## Implementing Digital Financial Reporting in Software

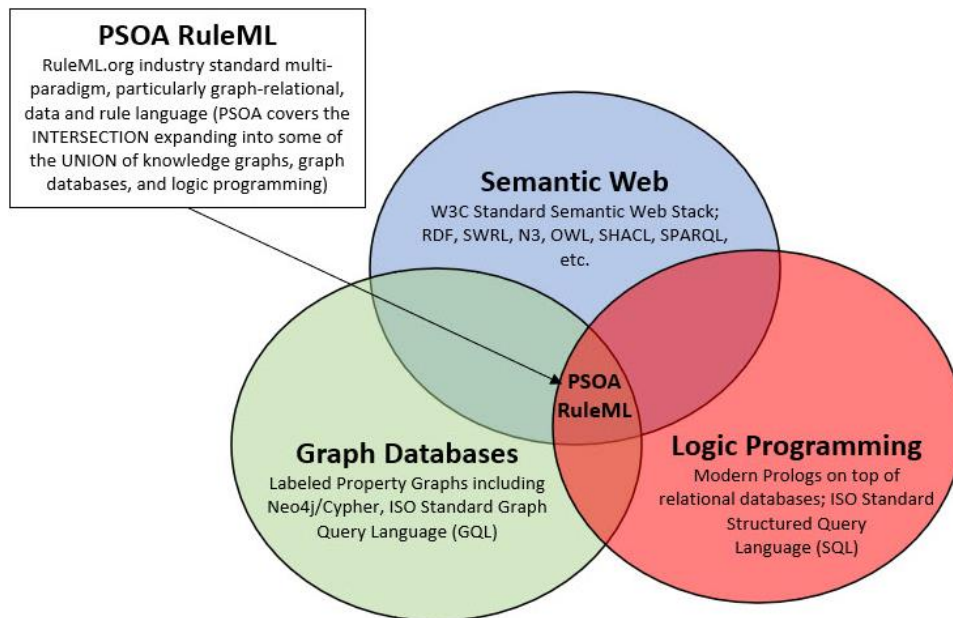
For many reasons, technical professionals have preferences for different technology stacks. These preferences, these idiosyncrasies, are caused by many things such as fads, trends, misinformation, politics, or just arbitrary preferences for one technology over another.

As such, multiple technology stacks are a fact of life with one particular entity or enterprise.

All that accounting knowledge that is created by skilled accountants with many years of experience needs to be physically represented using some technical format in some form. That machine readable information once created needs to be maintained and otherwise curated to keep the knowledge in usable form and correct. Software also needs to be able to effectively process that knowledge without catastrophic failure of the software.

The different technical approaches for physically creating this machine-readable knowledge tends to take one of three forms<sup>51</sup>. Those forms are: Semantic Web, Graph Databases, and Logic Programming.

The following graphic shows these three approaches but more importantly it points out that each of the approaches can be converted to the other approaches quite easily, or could if the logical information represented within by any approach is within the bounds of what can be represented by the other two technical formats.



Based on my experience, the following is an assessment of the important PROS and CONS of these three implementation approaches:

1. **Semantic Web Stack**<sup>52</sup>: Working with RDF/OWL/SHACL/SPARQL tends to be like working in computer assembly language. It would be hard to believe that the Semantic Web Stack is not flexible enough. It appears that the Semantic Web Stack is very powerful. This is released by the W3C and the core syntax is certainly a standard.

<sup>51</sup> Implementing Knowledge Graphs, <http://xbrl.squarespace.com/journal/2021/9/20/implementing-knowledge-graphs.html>

<sup>52</sup> Wikipedia, *Semantic Web Stack*, [https://en.wikipedia.org/wiki/Semantic\\_Web\\_Stack](https://en.wikipedia.org/wiki/Semantic_Web_Stack)

2. **Graph Databases**<sup>53</sup>: Graph databases are relatively new. A global standard graph query language (GSQL) is being created by ISO and is expected to be available in 2024. One of the most interesting graph databases that I have run across is TypeDB<sup>54</sup>.
3. **Logic Programming**: PROLOG<sup>55</sup> and LISP<sup>56</sup> where the first artificial intelligence problem solving logic programming languages. DATALOG<sup>57</sup> is a safe subset of PROLOG.

The bottom line is that I am not technically qualified to be able to make a decision about the proper approach to implementing XBRL-based reporting in software applications.

## My View on How the Future Will Unfold

In this section I will summarize my views on how I believe XBRL-based digital financial reporting will unfold. First, it is my preference that one universal (global) standard framework for digital financial reporting using XBRL should be created<sup>58</sup>.

Second, the U.S. Securities and Exchange Commission has given the world a gift in their early implementation of XBRL-based digital financial reporting by public companies in both US GAAP and IFRS. All of that information is publicly available for free. That information can be used to reverse engineer XBRL-based reporting that works extremely well. The SEC did 90% of what they should have done, in my view, but they left a few things out. But, that 10% can be added no problem, and should be, and can be as proven by the Seattle Method.

The ESMA (the ESEF format) and the SEC are far more consistent than they are different. The ESMA, likewise, left a few things out. But I believe that XBRL-based digital financial reports will be improved versions of things that are much like what the SEC and ESMA are currently doing, just adjusted slightly.

I personally believe that Inline XBRL is a red herring. Eventually, people will recognize that all that the Inline XBRL requirement does is cause more work. Once software can autogenerate human readable renderings, the desire to use Inline XBRL will fall by the way side. That may take 10 years, it may take 25 years, it may take 50 years, or it might never happen. The one thing Inline XBRL does is give “near pixel perfect” human readable presentations of financial reports. But that “document centric” approach might be jettisoned for a more “data centric” approach to financial reporting.

When people start seeing how properly created reports are viewed in properly created software applications; then they will begin to understand the value of XBRL-based digital financial reporting. Accountants should not need to “imagine” what software could do; they really need to be shown what software will do and I believe that if accountants are shown something that is truly BETTER, FASTER, and/or CHEAPER; they will use XBRL.

Information overload and information complexity is a problem. That problem can be solved by the same sorts of technologies that cause the problem in the first place. Trying to manage and control financial

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<sup>53</sup> Wikipedia, *Graph Query Language*, [https://en.wikipedia.org/wiki/Graph\\_Query\\_Language](https://en.wikipedia.org/wiki/Graph_Query_Language)

<sup>54</sup> Vaticle, *Introduction to TypeDB: a Strongly Typed Database*, <https://vaticle.com>

<sup>55</sup> Wikipedia, *PROLOG*, <https://en.wikipedia.org/wiki/Prolog>

<sup>56</sup> Wikipedia, *LISP*, [https://en.wikipedia.org/wiki/Lisp\\_\(programming\\_language\)](https://en.wikipedia.org/wiki/Lisp_(programming_language))

<sup>57</sup> Wikipedia, *DATALOG*, <https://en.wikipedia.org/wiki/Datalog>

<sup>58</sup> *Ten Keys to Creating a Universal Digital Financial Reporting Framework*, <https://digitalfinancialreporting.blogspot.com/2023/02/ten-keys-to-creating-universal-digital.html>

reporting processes by adding more and more expensive labor to what tend to be manual processes simply cannot work. Underlying processes can, and will, be modernized using tools such as structured information, artificial intelligence, digital distributed ledgers and such.

A paradigm shift can, and will; in fact, is occurring. Trying to understand that new paradigm using old maps is like walking around Chicago and trying to make your way using a map of New York City. The map is not the territory.

XBRL-based reporting can be implemented in a relational database like Microsoft SQL Server or a document database like MongoDB. But those databases don't treat relationships as first class citizens and therefore more work will need to be done to implement relationship information.

The next generation of software for XBRL-based reporting is appearing. Auditchain's Pacioli and Luca are examples of that next generation software that I am aware of and familiar with. But that software is only the beginning. A lot more software will be necessary to get accountants to change their processes. But one thing is for certain: the first generation of "bolt on" software for creating XBRL-based reports will not motivate any accountant to change their processes.

Software is a bottomless pit of opportunity. Once a solid foundation is set and XBRL-based reports and reporting is truly useful; accountants and software engineers will figure out more, and more, and more that software based applications can do to help accountants perform tasks and processes. What is necessary to build industrial strength software is understandable<sup>59</sup>. And that information will ultimately be understood and become best practices.

The promise of XBRL-based digital financial reporting can only be realized if the individual silos that currently exist can be changed by thinking differently and removing the friction that exists between those individual silos so that the system can work better when considered as a hole.

The year 2023 will start to see new approaches to building XBRL-based reporting related software. But I believe 2024 and 2024 will be even bigger. The "land grab" caused by the Financial Data Transparency Act of 2022 will be the primary reason. There is greater than a 50% chance that software vendors will learn from past mistakes and take new approaches.

Another factor that will favorably impact the creation of software is the fact that ISO is slated to complete their global standard graph query language<sup>60</sup> in 2024. When that occurs, the pace that graph databases proliferate will increase. Additionally, the increasing number of software developers that understand graph databases will result in better software being created. Other software engineers will prefer the Semantic Web Stack and that pace should increase also. What is less clear is whether PROLOG will catch on and receive more interest.

One thing that can slow the pace that digital financial reporting will be adopted is the extent that proper metadata exists for US GAAP and IFRS. It could be the case that some other financial reporting scheme embraces best practices such as the effort to create Annual Comprehensive Financial Report (ACFR)

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<sup>59</sup> *Ten Keys to Creating a Universal Digital Financial Reporting Framework*, <https://digitalfinancialreporting.blogspot.com/2023/02/ten-keys-to-creating-universal-digital.html>

<sup>60</sup> GQL Standard, <https://www.gqlstandards.org/>

XBRL Taxonomy<sup>61</sup> which relates to the Financial Data Transparency Act which could ultimately impact 110,000 state and local governmental entities in the United States. Once one major financial reporting scheme XBRL taxonomy adopts best practices and becomes an example to others; the pace of adoption of digital financial reporting will take off like a rocket.

While the world may not standardize for years to come; individual software vendors can create Stage III products which are useful to enterprises and provide clues necessary to turn digital financial reporting into the Stage IV Commodity that it really should become.

## Taking your Next Steps

*The Great Transmutation* is already underway. We have outgrown the overwhelmingly manual processes what we have but we have not created what we need to replace what we have yet. Change will be messy over the next five to ten years. If you are not sure where to start your journey into the future, I would suggest starting with the information here on my blog, *The End (Start Here)*<sup>62</sup>. Of particular interest I would suggest the following:

- ***The Great Transmutation***<sup>63</sup> helps to explain the vision and how to get there in broad brush strokes.
- ***Financial Report Knowledge Graphs***<sup>64</sup> provides a bit more detail and helps shift your perspective of what a financial report really is.
- ***The Seattle Method***<sup>65</sup> provides many of the details necessary for both accountants and software engineers.
- ***The Golden versions of my prototypes***<sup>66</sup> (Accounting equation, SFAC 6, SFAC 8, Common Elements of Financial Report, Essence, MINI, PROOF, XASB, AASB 1060) are excellent resources for understanding the intimate details, testing software, understanding capabilities, giving demonstrations.
- The document ***Mastering XBRL-based Digital Financial Reporting***<sup>67</sup> is a synthesis of the best and most important information on my blog.

Fighting innovation is a fool's errand.

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<sup>61</sup> ACFR XBRL Taxonomy (Draft), <https://digitalfinancialreporting.blogspot.com/2023/01/acfr-xbrl-taxonomy-draft.html>

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