

Will XBRL Improve Corporate Governance? A Framework for Enhancing Governance Decision Making Using Interactive Data

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Abstract: This paper puts forward the proposition that XBRL does indeed have the potential to significantly improve corporate governance. But it will only do so if those advocating XBRL understand the value chain of information of governance players and establish the role that XBRL can play in driving better governance decisions. XBRL has to be more than a distribution mechanism for data or facilitating technology. What must be taken advantage of is XBRLs capability to enable data to be disaggregated and reformatted in a way that can lead to new insights and decision relevant knowledge. Putting that potential into practice requires an XBRL taxonomy model that is data based than is the document based focus of the current specifications, as well as a flexible rendering system. Developments in XBRL GL and XTD taxonomies are the most promising as far as enhancing governance decision making using interactive data is concerned.

Keywords: XBRL, corporate governance, interactive data, decision support.

1. Introduction

*“At the Practising Law Institute's annual "SEC Speaks" event on Feb. 9 [2008], SEC Chairman Christopher Cox said XBRL, the Internet programming language newly adopted by the agency, is helping his staff root out fraud by tagging financial data so computers can track it and sift through it quickly... Cox said the timing of the options backdating scandal coincided with the SEC's decision to begin converting Form 4 submissions -- the form companies use to report stock option exercise transactions -- into interactive documents. Before 2003, information filed on the SEC's Form 4 was analyzed the old-fashion way -- retyped into SEC databases and spreadsheets before being scrutinized. "Not surprisingly, for all of that time, the backdating phenomenon was never uncovered," Cox said. More recently, however, the SEC started collecting Form 4 data in an interactive format, which made analyzing the information easier. The SEC also issued new rules around the same time requiring real-time reporting of options awards -- within two days of the grant. **"Once real-time disclosure was combined with interactive data ... we began to find clues that had previously gone undetected. That led directly to the discovery of what we now know were billions of dollars of backdated stock option awards," Cox said.**"*

(Block et al. 2007, emphasis added)

Christopher Cox, the former chairman of the US Securities and Exchange Commission, made the adoption of the eXtensible Business Reporting Language (XBRL) for tagging financial information his signature initiative—a program that came to fruition in February 2009 with the issuance by the SEC of the final rule mandating the use by large US firms of “Interactive Data To Improve Financial Reporting”.¹

It is noteworthy that amongst the various benefits Chairman Cox repeatedly put forward for XBRL, such as not needing to retype financial data and the ease of communicating it, he draws particular attention to its use in improving governance.² And while in the powerful example quoted above Chairman Cox is referring to the use of XBRL by regulators to root out earning's management, the same practices can obviously be adopted by governance

¹ <https://www.vtrenz.net/imarkownerfiles/ownerassets/627/SEC%20Final%20XBRLrule.pdf> Cox tended to use the term “interactive data” instead of XBRL and we treat the terms interactive data and tagged data as synonyms in this paper.

² See www.XBRL.org for more details about XBRL From that website, here is a “simple explanation” of XBRL: “The idea behind XBRL, eXtensible Business Reporting Language, is simple. Instead of treating financial information as a block of text - as in a standard internet page or a printed document - it provides an identifying tag for each individual item of data. This is computer readable. For example, company net profit has its own unique tag. The introduction of XBRL tags enables automated processing of business information by computer software, cutting out laborious and costly processes of manual re-entry and comparison. Computers can treat XBRL data "intelligently": they can recognize the information in a XBRL document, select it, analyze it, store it, exchange it with other computers and present it automatically in a variety of ways for users. XBRL greatly increases the speed of handling of financial data, reduces the chance of error and permits automatic checking of information.”

watchdogs within the firm, such as internal auditors and boards of directors, even leaving aside the fact the monitoring by regulators is a central aspect of governance in its own right.

This paper examines the question of whether XBRL will improve corporate governance. Given Chairman Cox's endorsement, this seems an absurd question. Surely considering the benefits of XBRL that goes without saying? To continue what seems like restating the obvious, consider another quote, this time from KPMG, though similar sentiments are plentiful from many other sources in business:

“For today’s enterprise, the issue of understanding report consolidation and the controls that exist around those reports is a critical part of corporate governance. In addition to building a corporate culture of accountability and accuracy, there is a very real need to re-examine the manner in which information is produced, verified and disclosed... We believe that for many enterprises the use of XBRL technology will prove the most suitable, platform-independent way to impose rigor on the framework of reporting.”
(KPMG 2008)

The title of the website from which the quote is drawn, <http://www.kpmg.com/Global/WhatWeDo/Audit/Pages/governance.aspx>, is probably as telling (despite its spelling error) as the substance of the quote itself, since it firmly places XBRL within KPMG's vision of governance.

Which brings us back to asking if the null hypothesis is that XBRL will improve governance, then what could possibly be the alternate hypothesis? In other words, how could XBRL not improve governance? We have two responses to this question.

First, just because something seems obvious, does not make it so in reality. Thus, if the benefits of XBRL are so manifest, how does one explain the relative lack of success of the SEC's voluntary filing program for XBRL reporting which has seen only a few score firms adopt tagging out of a candidate reporting population running into the thousands? Similarly, despite International Financial Reporting Standards (IFRSs) having been adopted by over one hundred economies worldwide, with the IFRS taxonomy—the XBRL set of tags for IFRS—having been made available and continuously updated since 2001, the fact is that there are hardly any firms making use of that taxonomy.

Second—and we see this as not unrelated—even when the benefits of a concept are real and large, they still can only be realized when it is determined how that concept can be translated into practice. Thus, granting the likelihood that XBRL will indeed improve governance, the

focus has to shift from talking up the potential benefits of XBRL to developing the mechanisms by which XBRL will change the way in which governance is conducted.

In this paper we develop a framework for understanding how tagged data can be used to change the way in which decisions affecting governance are made. Ultimately data, however it is formatted, is simply a means towards an end and it provides no value added unless different decisions are made as a result of its availability. We use Elliot's (1998) model of decision making and apply it to the governance area to serve as a framework for an investigation of precisely how XBRL will provide value added.

Our conclusion is that for XBRL to fundamentally change governance it has to add more value than simply facilitating data exchange. The information value chain analysis indicates that new ways of viewing and manipulating data yields better information, which when combined with more powerful analytic tools leads to the knowledge that allows better decision making about governance. Hence, the value added from XBRL comes from using it as a tool to disaggregate and reformat data so that users, by seeing problems in a new way, are stimulated to generate new information and knowledge.

This perspective has significant implications for XBRL because while the potential to view financial information in a disaggregated fashion is present at the level of taxonomy modeling, XBRL is today predominantly a document-centric model and only moving slowly to a data-centric model. Of course, the adoption of XBRL Global Ledger (XBRL GL) or XBRL Dimensional Taxonomies (XDT) will go a long way towards giving XBRL the flexibility needed to unlock the full value added inherent in tagged data. But regardless of the extent of tagging, to take XBRL's potential to improve governance to beyond the anecdotal stage requires a systematic examination of how data is used in the governance decision making.

The next section of the paper provides a literature review of the technical aspects of XBRL relevant to its use in governance. Section 3 then introduce Elliot's (1998) decision making framework which we use as a template to examine how XBRL can impact governance. Section 4 presents our proposition that for XBRL to fundamentally change governance decision making it has to be used to present information in new ways that drive analytical insights by users. Section 5 offers concluding comments.

2. Literature Review

We conduct an analysis of available literature on financial accounting and XBRL with a special focus on how XBRL taxonomies are developed. We see the development of XBRL taxonomies such as the US GAAP or IFRS taxonomies as the key determinant for later governance decisions. We also observe that some XBRL technologies can better support corporate governance than others. In this section we will analyze XBRL building blocks and technologies and discuss how these are utilized for XBRL taxonomy development.

2.1. XBRL Building Blocks

The origin of XBRL dates back to 1998 when Charlie Hoffmann started prototyping with XML for financial statements. The XBRL specification is defined as follows:

“XBRL is the specification for the eXtensible Business Reporting Language [which] allows software vendors, programmers, [and] intermediaries in the preparation and distribution process and end users who adopt it as a specification to enhance the creation, exchange, and comparison of business reporting³ information”.

XBRL was designed to support the preparation and distribution processes of business reports as well as creation, exchange, and comparison of them. This significant statement underlies all XBRL specifications. It shows that the orientation of the XBRL Consortium is towards enabling XBRL for use in the financial information value chain. Willis and Hannon (2004) state that to achieve this goal XBRL provides a common standardized format that enables applications to seamlessly share and process data. The XBRL specification is the base for two adaptations of XBRL. The first, which is called XBRL for Financial Reporting (FR)⁴, deals with the creation, exchange, and comparison of financial reports. The second, called XBRL Global Ledger (GL) deals with journal entries, accounting master files, and historical status reports.⁵

³ According to Engel et al. (2003) business reporting includes, but is not limited to, financial statements, financial information, non-financial information, general ledger transactions and regulatory filings, such as annual and quarterly reports. XBRL specification defines XML elements and attributes that can be used to express information used in the creation, exchange, and comparison tasks of business reporting. XBRL consists of a core language of XML elements and attributes used in XBRL instances as well as a language used to define new elements and taxonomies of elements referred to in XBRL instances, and to express constraints among the contents of elements in those XBRL instances.

⁴ The term XBRL FR is sometimes referred to as XBRL visual reporting (XBRL VR).

⁵ It should be added that although XBRL GL is represented by the means of a taxonomy the term XBRL GL Framework is more suitable. This is due to the fact that while XBRL FR taxonomies standardize vocabularies (for example the IFRS taxonomy provides common concept for Revenues) the XBRL GL taxonomy provides

The main building blocks of XBRL technology are XBRL specifications, XBRL taxonomies and XBRL instance documents. XBRL specifications regulate the syntax for reporting based on the language. There are reporting specific extensions to several XML specifications. XBRL taxonomies compromise business concepts for further reporting in the form of catalogues or thematic vocabularies (with the exception of the XBRL Global Ledger taxonomy). The reported business facts are encoded in instance documents as reports. The relationship and roles of XML specifications, XBRL specifications, XBRL taxonomies and XBRL instance documents are presented in [Error! Reference source not found.](#)

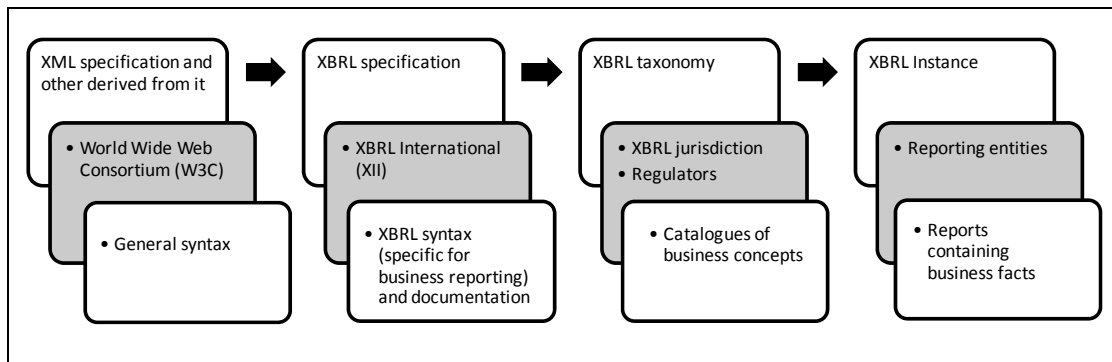


Figure 1: Main Building Blocks of XBRL

The XBRL specifications are built and maintained by the XBRL International (XII).⁶

Additionally the latest published XBRL recommended specification (XBRL Dimensions 1.0) describes how to model sophisticated report structures in a multidimensional manner. XBRL was intended to express data in the form of business reports. Nevertheless the need for modeling and expressing more sophisticated data structures and especially dimensionally modeled data pushed the XII to create of the XBRL Dimensions 1.0 specification (XDT). XII is also developing further technology components in addition to the above mentioned two specifications. These are versioning, formula and rendering. Versioning enables documenting changes between two releases of the same taxonomy which can be automatically processed by applications. Formula specification gives the opportunity to provide standardized business rules and comprehensive validation toolset. Finally rendering

just placeholders (for example, placeholders for account name, account number and account value). The fact values together with values for their characteristics are placed in instance documents.

⁶ XII defines itself as “... a not-for-profit consortium of over 450 companies and agencies worldwide working together to build the XBRL language and promote and support its adoption” (XBRL 2006).

supports human readable display of business information. As we will explain later all XBRL specifications play different roles when talking about corporate governance.

2.2.Document and Data Centric Financial Reporting Taxonomies

XBRL taxonomies reflect existing accounting standards (IASCF 2008) and/or reporting best practices (XBRL US 2008). The process of taxonomy development encompasses the creation of a data model on the basis of accounting standard (or other sources of information) and instantiating of the data model by the means of XBRL specifications. In the case of the IFRS taxonomy the underlying legal source is the IFRS Bound Volume (BV) which represents the annual publication of the most recent standards and interpretations released by the International Accounting Standards Board (IASB). Disclosure requirements form the IFRS BV guide the development of the IFRS taxonomy. A similar process underlies the US GAAP taxonomy.⁷

There is over a decade of history behind the development of this *de facto* standard which has had an enormous impact on the current shape of XBRL and its implementations. XBRL evolved from a simple transmission protocol for financial information into a comprehensive set of technologies which supports data modeling (and more importantly, multidimensional data modeling), financial data querying and setting of business rules, and also the visualization of business information.

Importantly, there has been no corresponding evolution in the accounting standards setting process. Most accounting standards stress document-oriented financial reporting—for example, the major focus of IFRS and GAAP on the distinction between face and notes of financial statements. While such an approach is based on tradition for accountants it is not the optimal approach for IT experts and data modeling experts. The latter tend to move to more analytical view on business information which leads to multidimensional modeling.

XBRL has recently attempted to bridge this gap by offering multidimensional modeling of accounting standards. Both US GAAP and IFRS taxonomies utilize multidimensionality, but we can observe the multidimensional approach utilized to a much greater extent in taxonomies for prudential and financial reporting of financial institutions in Europe

⁷ Although it must be stated that the US GAAP taxonomy goes beyond FASB, AICPA and US SEC disclosure requirements providing industry specific concepts and extensively utilizing XBRL dimensions, the design of the taxonomy itself goes back to single documents (or specifically schedules).

(COREP and FINREP). We argue in this paper that with the multidimensional approach to XBRL taxonomy development can significantly enhance corporate governance decisions compared to the document oriented XBRL taxonomy design.

We now turn to the analysis of the existing XBRL taxonomies. We specifically address the IFRS, US GAAP, COREP and FINREP taxonomies.

Existing XBRL taxonomies make extensive use of the XBRL 2.1 specification, but there is also growing use of the XDT specification. The XBRL 2.1 specification pushed most taxonomies towards the document-oriented approach, as can be observed in the earlier US GAAP and IFRS taxonomy releases. Most modeling was highly document oriented, especially the use of such modeling techniques as presentation hierarchies or having a single concept per cell of a table—for example, in tables representing “Movements in Property, Plant and Equipment”, a 10x10 table was expressed by the means of 100 individual concepts linked together as a graph.

With the introduction of the XDT specification this focus changed.⁸ Instead of beginning by asking the question “what does the financial report which the taxonomy represents look like?” taxonomy developers started by asking the question “what are the logical relationships between data entries which need to be modeled in the taxonomy?” This led to the development of more data-centric taxonomies, as opposed to the previous document-centric focus. The introduction of over 250 dimensions for the latest US GAAP taxonomy or over 10 dimensions for the IFRS taxonomy demonstrate this transformation in the approach towards taxonomy development.

As those differences in the number of dimensions indicate, there is a significant difference in the construction of the US GAAP and IFRS taxonomies. The IFRS taxonomy follows a balanced approach between data and document orientation, for example, using a single concepts per cell in the tables for the movements in property, plant and equipment while disclosure of operating segments is expressed by the means of dimensions. By contrast, the US GAAP taxonomy introduces dimensions for a significant number of schedules which

⁸ As a modular extension to the XBRL 2.1 specification, The XDT continues to suffer from certain restrictions which make it difficult to model a taxonomy in a way that emulates the structure of a database or data warehouse.

reduces the number of concepts in the taxonomy as well as better reflecting the relationships among the concepts.

The US GAAP taxonomy modeling is similar (and in many ways based on experiences of) the way in which the Committee of European banking Supervisors (CEBS) models the taxonomies for Common Reporting (COREP) and Financial Reporting (FINREP). While COREP reflects the Basel II regulations for reporting of solvency ratio and is a stand-alone taxonomy, FINREP reflects the financial reporting of financial institutions based on IFRS and is extension of the IFRS taxonomy. Interestingly both COREP and FINREP taxonomies were modeled from spreadsheet templates defined by business experts (which would be indication of document-oriented modeling). But surprisingly, both COREP and FINREP taxonomies were the main drivers which led to the development of XDT and were the first examples of a multidimensional data-centric approach to XBRL.⁹ COREP, in particular, is a highly dimensional taxonomy utilizing up to seven dimensions in one hypercube (by comparison, the IFRS and the US GAAP taxonomies usually provide only one dimension for a given measure—for example, *Revenue* reported for breakdown of *Geographical areas*).

Moreover, the developers of COREP and FINREP taxonomies produced so called matrix schemas for both taxonomies. Matrix schemas indicate the full multidimensional model for each of these taxonomies without the relation to XBRL specifications (providing conceptual multidimensional model not related to XBRL syntax). In other words it is possible to use matrix schema for the design of a database for COREP or FINREP. While in the past matrix schemas was reverse engineered from the existing taxonomies, currently the Committee of European Banking Supervisors experts who develop the COREP and FINREP taxonomies are considering multidimensional modeling by the means of matrix schema for the development of forthcoming releases.

The multidimensional approach also contributes in a significant way to improve the quality of reported data by the means of business rules. In particular, the use of XBRL formulas to express business rules greatly uses the XDT approach and follows the dimensional aspect

⁹ It should be mentioned that COREP follows the multidimensional paradigm to a greater extent. This is due to the fact that the IFRS taxonomy which was the basis for the FINREP taxonomy was not using dimensions at all. Additionally COREP covers mostly numeric data while FINREP to some extent concerns also non-numeric data entries.

model. It relies on the assumption that each characteristics of any reported fact in an instance document is dimensional and as such can be filtered to execute certain business rules.

To summarize, the modeling of XBRL taxonomies is moving slowly towards multidimensional data-centric modeling and away from document/presentation-oriented modeling. However, the process is in its initial phases and is far more advanced with other taxonomies, which we shall argue constrains the use of XBRL in the governance arena.

2.3.The Rendering of Financial Information in XBRL

When considering the way in which XBRL will impact governance, as important as whether XBRL is data or document oriented is how the players in the governance process will access interactive information. One of the recent focuses of the XBRL Consortium is the rendering of XBRL tagged information, meaning a standardized method for the presentation of XBRL instance documents in human readable form.¹⁰

According to Hoffman (2006) existing XBRL specifications have their weaknesses when used for associating information and expressing relationships between XML elements that are not XBRL concepts. A very common case is the use of the presentation linkbase (part of XBRL taxonomies) in order to display the reported facts in a hierarchical order. This approach is highly undesirable since the presentation linkbase was designed in order to provide a hierarchy for the taxonomy development and taxonomy use and not to provide structure and rendering information for the facts reported in an instance document.

A variety of options to enable rendering of instance documents in a standardized way have been discussed in the XBRL community. These include:

- Inline XBRL (iXBRL) as a possibility to embed XBRL instance documents in HTML documents;
- rendering linkbase as a possibility to provide standardized way of rendering metadata (as opposite to iXBRL which renders data itself);
- other approaches such as XSLT or CSS (both concern rendering of metadata).

¹⁰ Rendering focuses on the content and structure of the displayed data. It does not cover presentational features such as font, colors, graphics and similar items.
See <http://www.xbrl.org/technical/requirements/REN-REQ-PWD-2007-07-24.htm>.

Clearly a problem is that while market participants demand a standardized solution for the rendering of instance documents, the requirements of the various participants differ. This situation makes it difficult to adopt one single solution to the rendering problem. Interestingly the latest interest of the SEC is in iXBRL for rendering purposes which may establish a best practice for rendering:

“IDEA and its counterpart services run by other securities regulators, companies registrars and exchanges will almost certainly receive and republish entire iXBRL documents that can be read by humans and computers alike, rather than just getting the raw, computer-readable information contained in an XBRL data document.” (FSN 2008)

The continuing uncertainty over rendering poses difficulties in the use of XBRL for governance. While with the increasing adoption of multidimensional taxonomy modeling we can achieve greater analytical capabilities (slicing, dicing or pivoting of business information), with all the rendering options being considered, XBRL will effectively step back to a document-oriented format again. Ironically, the understandable pressure from the XBRL stakeholders for human-readable information processing, will undermine its use in the governance process, as we anticipate increased analytical functionality as being of higher importance in the respect to the use of XBRL in corporate governance.

However, having examined the building blocks and future functionalities of XBRL, it is time we turned to explaining what precisely is our paradigm of XBRL-enabled governance.

3. The Role of XBRL in Governance Decision Making

3.1. Takeaways from SEC Example

While the use of XBRL to detect options backdating is a striking illustration of its potential to improve governance, the lessons it provides cannot be taken at face value. Chairman Cox stressed not only the importance of having tagged data available, but also the fact that the SEC started collecting information on options in much closer to event time (*“SEC also issued new rules around the same time requiring real-time reporting of options awards—within two days of the grant.”*). And equally critically, the Commission had the analytic capability in its large and dedicated staff to be able to examine the data it was getting and to detect anomalies in it. Indeed, the former chairman praised his staff in rather dramatic terms:

“The chairman even compared his team of enforcers to the characters in the hit TV show “Heroes”—everyday people with extraordinary abilities they didn't know they had. Cox said his enforcement staff is a group of otherwise ordinary people with extraordinary talent

and dedication. In other words, ‘Save the Cheerleader—Save the World’, Cox said, intoning the show’s mantra. He added that while his staff may not possess super powers, ‘by sheer willpower and hard work they routinely accomplish great deeds.’”

The point is that the SEC succeeded in indentifying stock option backdating not just because they had the technology of XBRL, but because it was part of a process that took advantage of XBRL’s capabilities:

1. **Real Time Reporting:** Reducing lags in monitoring so that analysis is timely enough to be actionable.
2. **Analytical Capability:** A large and well trained staff that gave the SEC the capability to make use of the XBRL-enabled data and to analyze it to see patterns they previously missed.
3. **Motivation:** A clear goal by the SEC staff of detecting and deterring earnings management.

In short, this example demonstrates the dictum that governance is a process, not an outcome alone. To develop a framework for how the decision making process of governance can be enhanced using tagged data, we approach it systematically. First, we discuss the decision making process.

3.2. Modeling the Decision Making Process

The model of the decision making process which we use in this paper is that of Elliott (1998) which shows the steps in that process both sequentially, and in order of increasing value added:

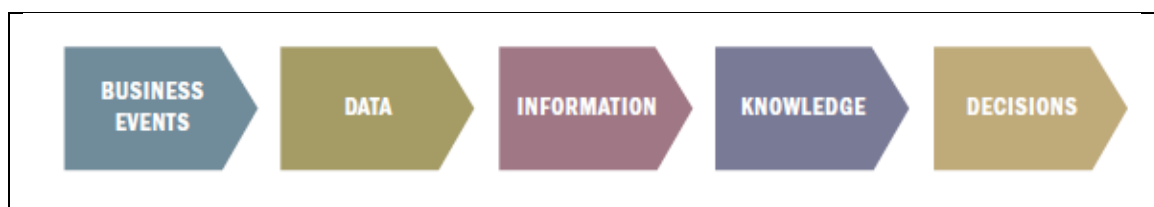


Figure 2: Information Value Chain (Elliott 1998)

The decision process is initiated with the completion of the business events that the firm engages in, be it selling products or purchasing raw material and labor, which are recorded in the firm’s data systems, such as its general ledger. But that raw data itself is too voluminous and disaggregated for meaningful interpretation. Hence, users have to apply their training

and experience, aided by rules and tools for data manipulation, to extract the information contained within that data. For example, from the data contained in that general ledger, an accountant prepares statements of the firm's annual earnings, cash flows and balance sheet, relying upon accounting standards to guide the aggregation of transactional data into those summary statements.

It is that information which users analyze to convert into decision relevant knowledge: for example, all business students are taught financial statement analysis to unravel the summarization inherent in financial reports and to come to conclusions about trends and firm performance relative to competitors. Finally, that knowledge allows feasible decision alternatives to be derived and assessed, and a final decision made in the light of the goals and incentives of the decision makers.

Elliott uses his model to argue that accountants need to move up the value chain, with the value added from decision making being orders of magnitude larger than at the data entry stage. The problem, as he sees it is that much of accounting practice is focused on activities on the lower end of the value chain, such as data summarization and aggregation into financial statements, as opposed to knowledge generation and decision making.

XBRL cannot change those practices, but we can use this decision making framework as applied to governance to ask how, and to what extent, tagging impacts governance decision making. And, in particular, whether XBRL can be pushed up the chain to higher value added activities, for as this value chain analysis indicates, XBRL cannot fundamentally change governance if its main application is to data processing and handling.

Of course, there is no question that XBRL will have a major impact on the data stage of the value chain, as XBRL International makes clear (emphasis added):

*“XBRL is a language for the electronic **communication** of business and financial data which is revolutionizing business reporting around the world. It provides major benefits in the **preparation, analysis and communication** of business information. It offers cost savings, greater efficiency and improved accuracy and reliability to all those involved in supplying or using financial data.”* (XBRL 2008)

While these benefits are not to be underestimated, they do not speak to the higher end of the value chain, particularly knowledge generation leading to different decisions about

governance—as opposed to the same decisions arrived at faster or more cheaply. We now turn to discuss stakeholders in the decision making process and specifically their governance motivations.

3.3. Stakeholders in Governance Decision Making

Boards of directors, internal and external auditors, analysts, ratings agencies and investors all have a role to play in governance, but their informational needs and analytical capabilities differ. Those stakeholders inside the firm already have access to a larger set of information than the financial statement summaries that will be tagged under XBRL. Hence, for these players the process by which data is transformed into governance-related decisions is what tagging has to impact if it is to add value. By contrast, for stakeholders outside the firm, the primary use of XBRL will be to facilitate the communication of firm information.

We analyze the framework provided by Elliot from the viewpoint of motivations of stakeholders in the value chain. In the context of the financial information value chain the diversity of the stakeholders leads to a number of different goals existing in this domain. The list of the different goals and strategies is presented in [Error! Reference source not found.](#)

| Motivation/Business Goal | Description | XBRL Impact |
|--|--|----------------------|
| Provide assurance of financial reports | Assure that disclosed information is reliable | Impact unknown |
| Provide fair view of group | Provide information about the group which represents the fair view on group's financial position, performance and other relevant information | Potential to enhance |
| Provide a fair view of company | Provide information about the company which represents the fair view on company's financial position, performance and other relevant information | Potential to enhance |
| Protect capital market participants | Control of the listed companies in order to avoid practices not allowed on capital markets | Potential to enhance |
| Provide general public | Publish information in a form accessible | Potential to enhance |

| | | |
|---|---|----------------------|
| with financial information | to general public | |
| Reveal malpractice and mistakes of tax payers | Control of the tax assessment processes and analysis of financial information submitted by tax payers | Potential to enhance |
| Secure borrowings | Control of the borrowing entity esp. in the context of its solvency | Potential to enhance |

Table 1: Motivations of Information Value Chain Participants

We model the motivations listed in Table 1 using a graphical approach, presented in [Error! Reference source not found.](#), where the hierarchy of the goals and their relations are identified. The first goal, providing assurance on financial reports, supports the goals related to providing a fair view of the company or of the whole group. Also the consolidation of financial statements providing a fair view on the company supports providing a fair view on the whole group. Further, both goals support providing the general public with financial information. From the single company perspective providing fair view on the company protects market participants, helps reveal malpractices and mistakes in the tax assessment process and finally helps secure borrowings.

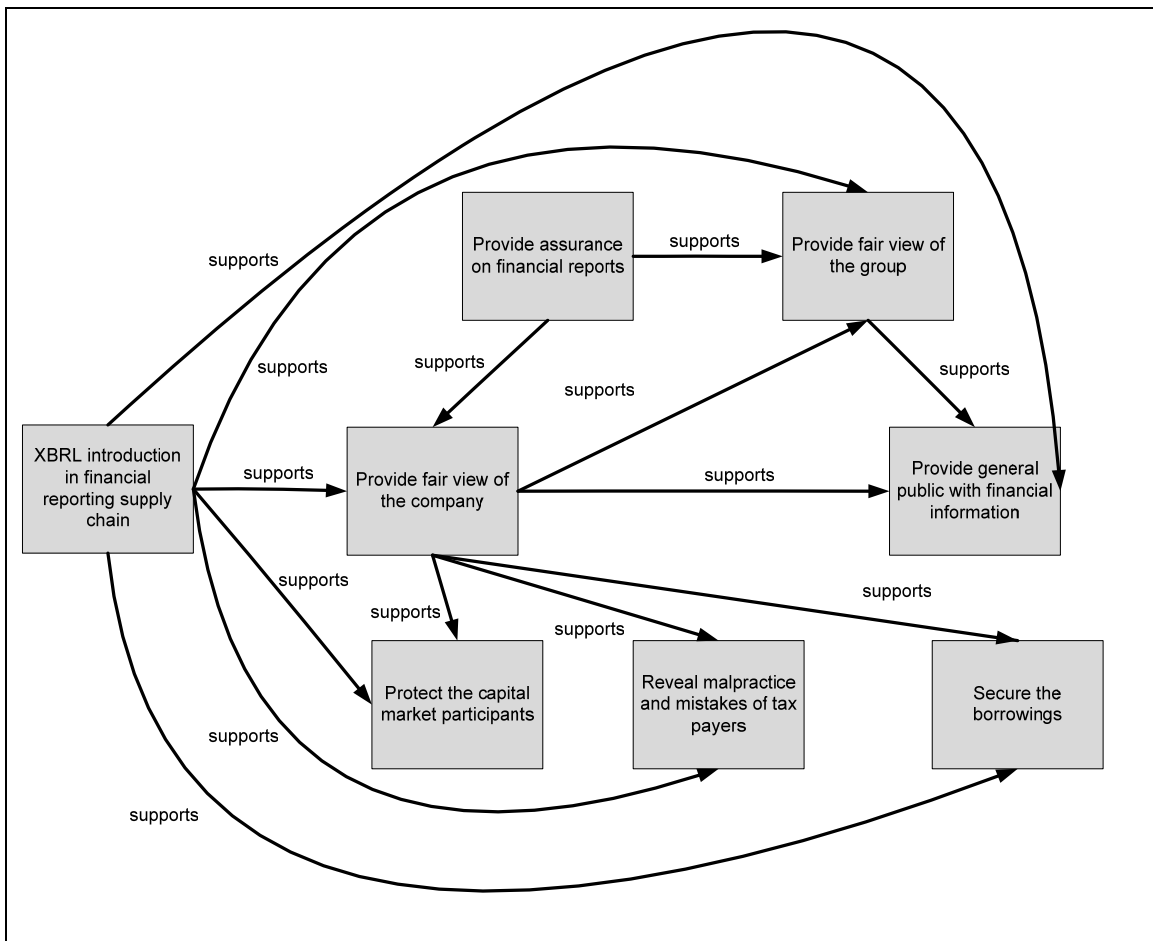


Figure 3: Motivation Model of Information Value Chain

XBRL supports most of the goals expressed by participants of different reporting scenarios. It is an empirical issue whether XBRL will increase transparency mainly through the use of official taxonomies so the reported facts are clear and well documented for the users, or whether firm-specific taxonomies will signal important differences more than causing confusion and ambiguity. The fair view on the company and on the group is achieved also through the validation procedures which can be applied to the reported instance documents. Further automatic consumption of instance documents enhances the protection of market participants, reveals malpractices and mistakes of tax payers as well as secures the borrowing. Supervisors, tax offices and borrowing banks have the ability to import XBRL reports into their analysis systems without necessity of manual data input. Also automated warning systems can be introduced where the focus is not on data integration but on data analysis. Finally, the use of XBRL combined with the other user readable formats allows providing the general public with the user-oriented publication of financial information clearly referenced to an XBRL taxonomy.

It is important to differentiate between open and close XBRL reporting in this case. Manual input can be fully eliminated in case of closed reporting where reporting entities are not allowed to extend the taxonomies. In such a case it is enough to provide a mapping between taxonomy elements and analysis system (usually represented by a database schema). In open reporting scenarios it is necessary to manually (or semi-automatically) map additional concepts in company-specific extension. More difficult to assess is the impact of XBRL on the assurance of financial reports. Trites (2006) indicates that issues concerning XBRL in the context of assurance are numerous, pervasive and evolving.

It always has to be kept in mind, though, that the ultimate source of governance is the discipline of market forces, through the stock price and the entity's cost of capital. Thus to facilitate that mechanism, the efficient and error free transmission of entity information to users outside the entity always has to be the main priority of XBRL.

Decision making, however, is more than having access to information, as is obvious from the fact that boards of directors are continuously striving (and lately, often failing) to figure out how to analyze all the information they can freely request. The communication of

information is only a means towards the end of better decision making using that information, and hence, it is on that process where the emphasis must lie. Moreover, with a general purpose tool like XBRL the identity of users is less important than the understanding of the method by which any such user makes their decisions about governance.

Developing high value adding applications of XBRL to governance decision making requires a more detailed understanding of how such decisions are made, but before turning to that topic, we need to explain where the decision model really begins, with data.

4. Information Content and Presentation as Decision Drivers

4.1. Presentation of Financial Information

“How an entity presents information in its financial statements is vitally important because financial statements are a central feature of financial reporting—a principal means of communicating financial information to those outside an entity.” (FASB 2008)

In recent years there have been numerous initiatives aimed at increasing the decision relevance of financial disclosures. Perhaps the most important ongoing one is the Joint FASB and IASB Financial Statement Presentation Project whose purpose is *“to establish a standard that will guide the organization and presentation of information in the financial statements”*.¹¹ Two key objectives of the new standard for presentation of financial information are to portray a cohesive financial picture of an entity’s activities and to disaggregate information so that it is useful in predicting an entity’s future cash flows.

A similar objective is the motivation behind the Enhanced Business Reporting Consortium whose aim is to *“promote greater transparency of corporate strategy and performance by developing an internationally recognized, voluntary framework for **presentation** and disclosure of value drivers, non-financial performance measures and qualitative information.”*¹²

The underlying assumption of both these projects is that the format and presentation (rendering, one might say) of financial statements drive decision making as much as the information content of the statements themselves. Indeed the fact that users perceive presentation format to be as much a source of information—intentionally or implicitly—as content is one that has driven much of both accounting practice and accounting research.

¹¹ http://www.fasb.org/project/financial_statement_presentation.shtml

¹² www.EBR360.com

The latter includes work on such market inefficiencies as functional fixation and earnings anomalies, while firms worry about the placement of information in footnotes versus in the body of the statements.

The potential impact that information presentation can have on decision making is one that has also been explored extensively in the literature on human cognition. For example, Tversky and Kahneman (1981) explored the effect that framing has on decisions, where the exact same problem results in a user making different choices depending on how the alternatives are presented. For our purposes one does not have to accept all the assumptions or implications of the academic research into the way in which humans make decisions in order to build a theory of XBRL and governance based on the importance both the FASB and the EBRC place on the way in which financial information is presented. The point is that XBRL is more than a means of communicating information, it is also a powerful tool for presenting it as explained in previous sections, and it is that aspect that more attention needs to be paid to.

One of the major outputs of the Enhanced Business Reporting Consortium was a series of sample reports “developed as an illustration of the style and content of an enhanced corporate reporting information portal”.¹³ These reports presented a sample set of web based and printed income statements and balance sheets based on such frameworks as the Balanced Scorecard and the PricewaterhouseCoopers Value Reporting Framework. The EBRC was certainly aware of the potential of XBRL and stated that: its aim is to “Move towards a “demand-pull” model that allows users of business information to identify and extract those elements that they consider most important. This model would provide ongoing feedback to preparers, regulators and others on how well reports are responding to user needs. Leverage XBRL to help facilitate this process.”¹⁴

However, one of the interesting aspects of these sample reports is that each is based on a different company, with their own data sets. To some extent this was dictated by the fact that different teams prepared each report and the need to match the data to the chosen presentation format. Nonetheless, one of the authors of this paper was an observer to the EBRC committee preparing these sample reports, and he encountered strenuous objection to his proposal that if the committee truly intended to “leverage XBRL”, then the best way

¹³ <http://www.ebr360.com/ContentPage.aspx?ContentPageId=27>

¹⁴ <http://www.ebr360.com/downloads/ebr.public.examples.pdf>

of doing that was to use the same tagged data for all the sample reports. This would facilitate a true “demand-pull” model where the users determined which presentation format was the most insightful to them, and indeed, to allow users to view the firm through a variety of different perspectives.

The same logic applies to the FASB’s presentation project, which is motivated in part, by the following concern: *“The International Accounting Standards Board (IASB) and the U. S. Financial Accounting Standards Board (FASB) initiated the joint project on financial statement presentation to address users’ concerns that existing requirements **permit too many alternative types of presentation** and that information in financial statements is **highly aggregated and inconsistently presented**, making it difficult to fully understand the relationship between the financial statements and the financial results of an entity.”*¹⁵

The point of view of the FASB is that the preparers of financial statements have too much flexibility in their accounting choice and that that they present information in ways that obfuscate rather than elucidate the firm’s financial position. Their solution is that *“the proposed presentation model requires an entity to present information about the way it creates value (its business activities) separately from information about the way it funds or finances those business activities (its financing activities).”* And moreover, *“to present a cohesive set of financial statements, an entity should align the line items, their descriptions, and the order of presentation of information in the statements of financial position, comprehensive income, and cash flows. To the extent that it is practical, an entity should disaggregate, label, and total individual items similarly in each statement.”*

To its credit, the FASB is considering rather radical changes to long-established financial reporting practices. For example, it is considering using both historic cost and fair value in different parts of the balance sheet to facilitate the dual goals of asset valuation and asset preservation. Of course, one reason such multiple bases for asset valuation have not been utilized in financial reporting all this time is the concern that it results in a lack of comparability and consistency, the familiar tradeoff between reliance and reliability.

It is noticeable that unlike with the EBRC, the FASB Presentation Project documents make no mention of XBRL. Not surprisingly then, the FASB fails to take advantage of the fact that XBRL tagged data enables users to see financial data in multiple different formats and

¹⁵ http://www.fasb.org/project/fin_stmt_presentation_phaseb_dp_summary_oct2008.pdf

using multiple different assumptions, consistent with a bottom up demand-pull vision of financial reporting. Our point is that a tradeoff between reliance and reliability is no necessary in a web based reporting environment with XBRL tagged data, since the user can view the financial statements with any base or, indeed, all bases, assuming, of course, that the underlying data has been tagged and made available. And perhaps the most productive action the FASB can take is to encourage such tagging “in depth”, as opposed to developing a new kind of financial statement.

The principal problem is with the focus on modeling the statements and the notes again. While the FASB Presentation Project provides some interesting aspects which would allow for enhanced multidimensional modeling of financial information (as mentioned in cohesive manner), the project itself makes no use of neither multidimensional modeling nor XBRL.

A similar approach can be used to facilitate comparisons between statements based on the US GAAP and IFRS, thus obviating the concerns expressed over the SEC’s recent decision to allow large firms to end the practice of reconciling one with the other. While this exploits the fact that such large global firms are already likely to have their figures in both GAAP and IFRS and so all that is necessary is to tag them and make them available to users, such an approach does not fully exploit the potential of XBRL. The point is not to make it easier for users to access data that they are already familiar with. Rather, by using XBRL to give users new and innovative way to view data, it is possible to move XBRL up the value chain toward the high value added decision making stage.

4.2.Implications for Governance Value Chain

The FASB proposal, like that of the EBRC, is a top down imposition on users of what the authority determines is a “better” format for financial statement presentation. By contrast, the real power of XBRL is the “democratization” of financial data, giving the user rather than the firm, or the regulator, control over how data is presented and perceived. This is analogous to the different decision perspectives approach (strategy, cost, operations, short run, long run) that revolutionized Strategic Cost Management in management accounting: facilitating making more sophisticated decisions by allowing the user to see the same problem through different “lenses”.¹⁶

¹⁶ Shank and Govindarajan (1993).

XBRL can liberate data, allowing users to view information differently and create new knowledge, rather than being forced to use a “one size fits all” statement. More fundamentally, data format choice shifts from preparer to user. In such an environment with firms focusing on providing data tagged in depth, as opposed to worrying about a particular presentation format, be it the valuation base or placement in footnotes, one can also envisage infomediaries offering proprietary methods for viewing data with the promise of unique insights to the user—such as PricewaterhouseCoopers Value Reporting Framework utilized by the EBRC.¹⁷

To illustrate how the ability to manipulate data in ways the user determines is value added as opposed to being forced to accept the version imposed by the firm or a regulator can improve governance decision making, consider that this is essentially what academics do in empirical capital market research. They have often found anomalies that are highly relevant to governance including earnings management and the stock option backdating that former SEC Chairman COX referred to.¹⁸ The problem is that academics come in too late and at too high a level to provide actionable evidence for governance of specific firms. But as Chairman Cox’s example showed similar techniques when combined with real time reporting and XBRL tagged data indeed have the potential to drive better governance at the firm level. The key enabler is the use of XBRL to provide input into powerful analytic tools. This can be facilitated by multidimensional XBRL taxonomies.

For example, consider how many academic studies need hand collected data which can be obtained more easily and in a more timely fashion through XBRL. Tagging essentially gives governance players their own real time CRSP tape of their firm—and this even without XBRL GL or XDT. In theory, XBRL enables analysts, auditors and boards of directors to replicate such academic analysis for their firms more easily, in time to be actionable.

However, the stock option backdating example also serves as a caveat for the limits of governance, since in that case some of the players responsible for firm governance, including CEOs and directors were implicated in the practice. It goes without saying that XBRL cannot change the incentives and motivation of governance players. If they didn’t exercise their fiduciary responsibilities before, then it is unlikely that they will do so simple because of

¹⁷ This discussion naturally leads to the concept of real time reporting. See Alles and Vasarhelyi, 2008.

¹⁸ Lie, 2005.

XBRL, which validates the emphasis that Chairman Cox placed upon the role of his staff in detecting what firms were doing. But that is also the benefit of driving governance with XBRL—tagged data enables one governance stakeholder, in that case regulators, to uncover problems even when other players fail to do so.

Once the premise is accepted that the way to use XBRL to drive better governance is to use its capability to present data in different, user define ways, in order to facilitate novel insights and better decision making, then one has to think outside the box about how those capabilities of XBRL can be used to drive fundamental changes in governance value chain. We present examples of sectioning and aggregating of financial information in Figure 4. For example, governance players, such as directors and auditors, could be required to see data in different formats and to account for those differences. This would be exploiting the impact that framing has on decision making, as opposed to falling victim to that cognitive shortcut.

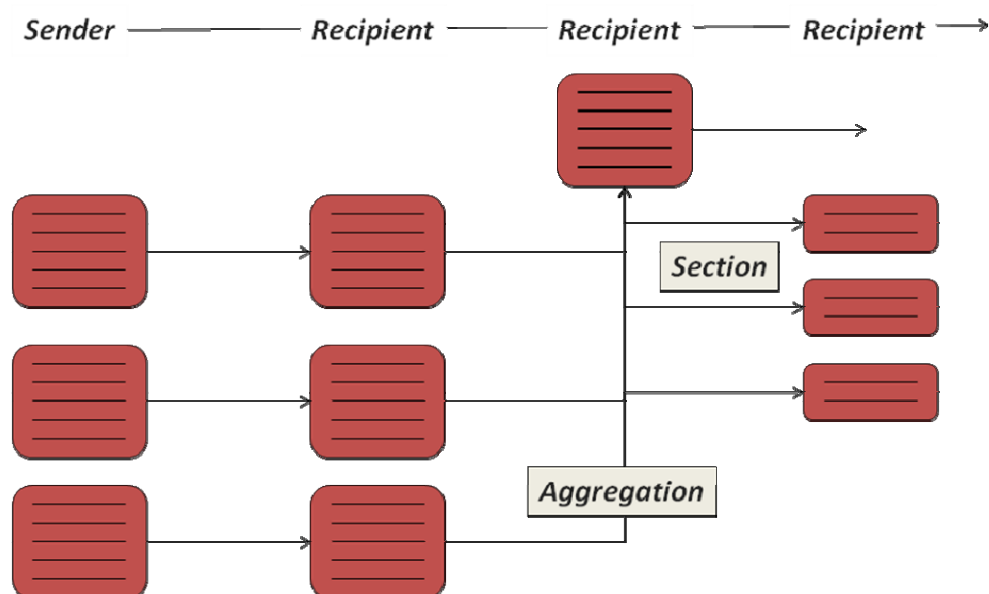


Figure 4. Improved Usage of XBRL Tagged Financial Information

Making use of this capability is a function of the rendering capability of XBRL, which indicates the importance of this issue, as discussed in the literature review above.

4.3.Document vs. Data Centric View on XBRL

In practice, the process which transforms data into information and decisions is more intricate than is illustrated in Elliot’s summary framework. In particular, when transactional

data is summarized and aggregated by accountants into financial statements by accountants, there is inevitably a loss of information detail, a loss balanced by gains in clarity and succinctness. By design XBRL enters this process only at the end, when data has been already transformed into summary statements. That means that it has to accept the tradeoffs and constraints built into those statements and carry them through the remainder of the value chain.

By contrast, XBRL GL is precisely meant to begin tagging at the data stage, when transactions enter the general ledger, so as to avoid the information loss inherent in summarization and aggregation into the financial statements. But we need to stress here that the standardization offered by XBRL GL is lower than standardization offered by XBRL FR. We referred to this before on one approach to increase the standardization offered by XBRL GL is to provide linkage to XBRL FR. It is reasonable to assume then that XBRL GL (in connection with XBRL FR and especially multidimensional XBRL) has a greater inherent potential to move data up the value chain than XBRL FR, since the information content of the latter is a strict subset of the former. That is to say, governance stakeholders can use XBRL GL tagged data to reconstruct XBRL financial statements, but they are not restricted to the line items on those statements. Using the much wider and deeper set of data tagged by XBRL GL, users can also format and view data in a much more flexible fashion. That flexibility is the basis for our argument as to how XBRL can fundamentally impact governance decision making.

Realizing that potential impact on governance, however, requires overcoming the limitations posed by the document centric nature of the current XBRL FR model, which does not facilitate the disaggregation of data for governance purposes. In an ideal world the possibility to view financial information differently would be considered at the level of taxonomy modeling. Unfortunately most XBRL related projects follow the document oriented taxonomy modeling and are only moving very slowly to multidimensional data centric modeling. Our paradigm for XBRL-enabled governance indicates that it is the combination of multidimensional data centric modeled taxonomies combined with support for custom viewing and rendering that will maximize the potential of XBRL to enhance governance.

Given this viewpoint it is important to classify the existing XBRL technologies according to their semantic importance. Figure 5 presents the division of XBRL technologies discussed in

the literature review into three groups. The underlying consideration is to identify existing XBRL data models, especially these expressed in different XBRL taxonomies and try to classify them according to the level of semantic complexity. The data model that is the basis for the XBRL GL and similar taxonomies is heavily based on “tuples” (sets of concepts). The importance of the relationships between concepts is of lower importance. Such a model is data oriented and has the lowest level of semantic complexity and also lowest standardization. The complexity rises in case of XBRL FR taxonomies. In such a case the hierarchies of concepts gain higher importance since the order in which elements are placed holds indirect information about the construction of the created report. This data model is oriented towards not only transmitting data entries but also expressing whole document (report) and keeping semantic relationships among reported facts. Such a data model is biased by the presentation of data in the documents. Finally the XBRL dimensions introduce the third and highest level of semantic complexity. By the means of XDT it is possible to model data entries and their relationships in an effective manner. Interestingly both XBRL GL and XDT are more data oriented than document oriented. But the semantic richness of the latter provides a bigger potential for analysis and decision taking.

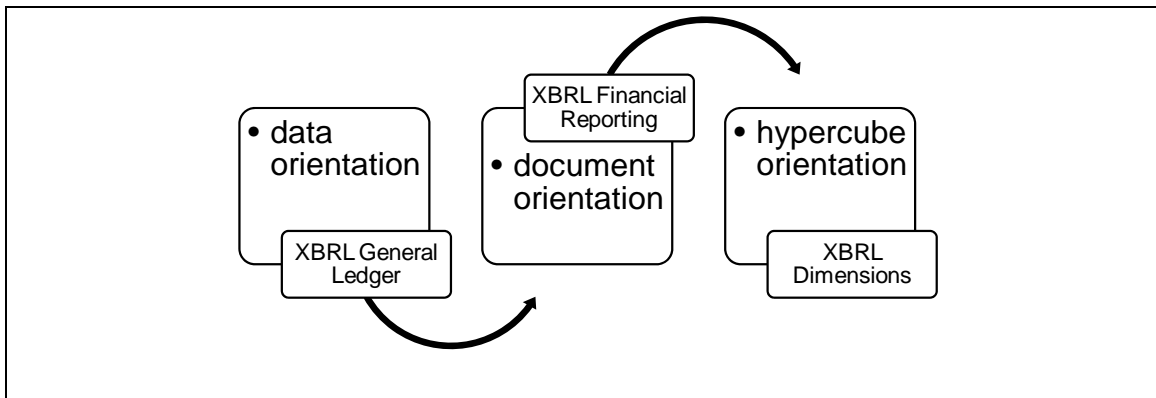


Figure 5. XBRL Modeling and Semantics

We envisage the use of XBRL GL with the linkage to the dimensionally modeled XBRL FR and even more to multidimensional data-centric taxonomies with flexible rendering possibilities as a potential way forward in the information value chain.

5. Conclusion

This paper has put forward the proposition that XBRL does indeed have the potential to significantly improve governance. But it will only do so if those advocating XBRL

understands the value chain of information of governance players and establish the role that XBRL can play in driving better governance decisions. XBRL has to be more than a distribution mechanism for data. What must be taken advantage of is its capability to enable data to be disaggregated and reformatted in a way that can lead to new insights and decision relevant knowledge. Specifically we need to focus on the capabilities offered by multidimensional XBRL data modeling and its further usage in analytical software.

Whether processes will be created to take advantage of that capability will determine the extent to which XBRL transforms corporate governance. However, we cannot conclude without mentioning several caveats.

First, some have argued that our proposal is redundant because analysts can already replicate what XBRL makes possible. It may be more expensive perhaps to manually pull apart 10k's, but since that is clearly being done already, XBLR is unlikely to have much of an impact.

Our response to this argument is that the impact of transaction costs should never be ignored. While it is certainly true that as envisaged currently, XBRL will only tag data that is already going to be in the public domain, there is a world of difference between having data on a piece of paper and having it in digital form as far as having decision relevant, actionable information is concerned. Again, Chairman Cox made that point much better than we can. And the even more famous commentator, Sherlock Holmes, perhaps put the issue even more pithily when he observed in the Hound of the Baskervilles that *"The world is full of obvious things which nobody by any chance ever observes."*

Moreover, there is no need to accept a limited vision for what XBRL can be or what it can do. We have called in this paper for what we call "tagging in depth". That does not necessarily mean XBRL GL, though that maximizes the data input into the information value chain. But even with standard XBRL, tagging in depth means providing users with tagged data that is maximal rather than minimal, incorporating different valuation bases, accounting standards and other relevant assumptions. Of course, tagging in depth is not an easy concept to sell, especially in a litigious US environment. But the proposed SEC XBRL mandate itself incorporates some notions of a good faith attempt safe harbor for tagging, and as audit practices for XBRL are developed, assurance can be provided on wider set of tagged data.

The second caveat that must always be kept in mind is that while using XBRL to give governance stakeholders different perspectives on firm data may lead to different decisions, it obviously cannot be guaranteed that they will be necessarily better decisions. But ultimately, one has to have faith that more and better information will also lead to superior decision making, which is, after all, the rationale for XBRL in the first place.

Having said that, researchers certainly need to examine frameworks within which XBRL is more likely than not to lead to better outcomes, which means explicitly placing XBRL into a governance decision making framework. When that is done, we will be closer to the vision outlined by former Chairman Cox, when he stated that:

“Over the coming decades, financial information almost certainly will be available in nearly real time and delivered to people in what today would be considered unusual ways—for example, streamed to them in already-processed form over wireless devices they carry in their hip pockets. There’s no limit to the possibilities. Our era, appropriately called the “Information Age,” is a golden age for markets. More-efficient markets mean a lower cost of capital, which in turn translates into more productivity throughout our economy—so customers and consumers are better off.” (Pickard 2007)

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