Towards Collective Intelligence

Broadening the Conversation through a Logical Model of XBRL

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Abstract

Enhancing the end user experience of XBRL requires better engaging the end user community into the collective conversation about the language. The current conversation is still largely technically biased. At present, XBRL lacks the conceptual tools and terminology which would allow end users to effectively understand, participate, and contribute to the collective intelligence that would enable the language to evolve towards its true potential. An important aspect of establishing a shared understanding is the means by which the facets of the language can objectively be critiqued, i.e. which facets add value and why, as well as which do not and why not. We propose the development of a logical model for rationalizing XBRL which would be comprised of two counter balancing parts. On one side, a taxonomy of capabilities (both of business and meta use cases); on the other side, a set of logical views on the facets of XBRL. The combination provides constituents with a logical model to better appreciate what can be achieved with the language; enriching the dialogue of what adds value and why, what detracts value and why, and what is missing and how it may be added. Such a model is an essential bridge across the current chasm between the technical community (with terse specifications and capabilities) and the business community (with practical objectives and needs). We see XBRL at a critical juncture, needing methods and means to facilitate broadening the discussion thereby benefiting from collective intelligence to facilitate innovation in an overt and public fashion.

A Shared Understanding – Having a Common Point of Reference

XBRL global adoption is at an inflection point, establishing an undeniable future for the language in the exchange of business information. This joint W3C/XBRL workshop is an opportunity to reflect upon where XBRL is and seek out and fold in other ideas. But before jumping to other innovations for the language, we think this is a critical moment to step back and consider the stage before us and what may be missing that will impede progress forward.

The objective of the workshop is “improving access to financial data on the Web.” Yet to improve something, there must be a means of objectively assessing its usefulness, the facets of what it does and how it does it. There must be a shared set of conceptual tools and terminology which form a simple intuitive framework for objectively evaluating “opportunities and challenges for interactive access to XBRL data at all stages of the reporting pipeline”. The burden of the XBRL journey has thus far been carried by a relatively small group of technical contributors. There needs to be a means of engaging a far larger intellect, not only technical creativity, but also end user critiques.

We see two main objectives in including a broader community of potential consumers of XBRL: first, to give greater shape to their needs within the XBRL community, second, to enhance their understanding of what is on their horizon. There is much to be gained from a better appreciation of how people function today in working with financial information – a better and more widely shared understanding

of the problem ensures a better solution. The trick is in the abstraction of the problem; not in crafting requirements (a fallacy in a rapidly evolving technical landscape).

XBRL Complexity – A Need for Better Visibility into the Technology Itself

In review of the XBRL specifications recommendations there is an abundance of terminology and a dearth of explanation or illustration of how the structures of the language deliver value. This leaves a business person at the edge of a formidable chasm requiring an inordinate investment of time to reach an understanding. This is not merely an issue of specification challenges; this also affects how XBRL is understood and implemented by the end users.

According to the study *A Comparison of XBRL Filings to Corporate 10-Ks -Evidence from the Voluntary Filing Program,* from a sample of 22 companies taken from the voluntary filing program they found that all 22 filings included filing errors. Although each error ranged in significance, they note "...these initial XBRL filings contained a large number of errors, many of which seriously impaired the usability of the XBRL data."

In Fred Brooks' seminal book *The Mythical Man Month* he talks about 'Accidental Complexity' and how the lack of an understood logical model is a recipe for disaster. He quotes:

> Using appropriate visual formalisms can have a spectacular effect on engineers and programmers. Moreover, this effect is not limited to mere accidental issues; the quality and expedition of their very thinking was found to be improved. Successful system development in the future will revolve around visual representations. We will first conceptualize, using the "proper" entities and relationships, and then formulate and reformulate our conceptions as a series of increasingly more comprehensive models represented in an appropriate combination of visual languages. A combination it must be, since system models have several facets, each of which conjures up different kinds of mental images.

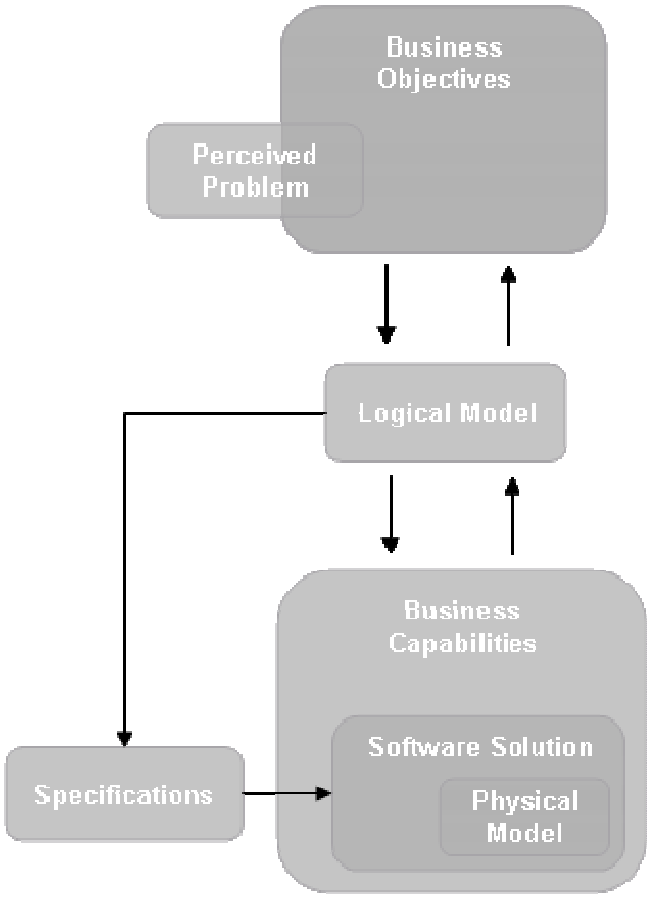
A Logical Model - a Conceptual Tool for Discussing, Analyzing, and Finding a Path

It may seem zealous, but the terminology and conceptual tools will aid in the exploration of what business' needs are and in working towards the capabilities that will shape the solution. It also helps keep everyone in sync and avoid talking past one another. Thereby making it clear, sooner rather than later, when clarification is needed on some advanced concept being worked with.

A logical model is a living artifact that provides a set of architectural perspectives or views into a set of concepts and capabilities. Each perspective, similar to physical architecture, isolates a set of concerns that can be understood in context. The intent of a logical model is to facilitate discussion and debate. Having a logical model of XBRL architecture of the pertinent parts of the business domain aids in clearing the waters to what is relevant and how it all relates. A visually oriented logical model can cut through the morass of rhetoric and better empower users to discriminate among features and evaluate the

merits of the solution. Importantly, the logical model starts the process of discovery for the usability engineering which ultimately impacts the productivity of end users.

It helps to keep in mind that the goal of system architecture is to translate business needs that are fulfilled through a set of capabilities which come in the form of a software solution. The logical modeling acts as a translation layer with business needs becoming specifications. A physical implementation is a proof of the logical model, in its sufficiency, correctness, and self consistency. A physical model is a point in time solution that is derived from the logical model based on priorities and resource constraints. The dangers of developing technology without a logical model are touched on by Dan Bulos in his Whitepaper on OLAP Design. In the paper he discusses the differences of Logical vs. Physical Modeling. In particular he emphasizes that the goal is to translate business needs into a working system and to that end logical modeling acts as a translation layer.



Tight deadlines and easy to use software can tempt organizations to forego logical modeling and go straight from the application description directly to the physical implementation. However bypassing logical modeling can result in an application that merely reflects the chosen implementation technology instead of the functionality of the business. Logical modeling helps ensure a focus on solving the business needs and can be thought of as an enterprise asset that transcends any particular implementation or set of technologies at any given point in time. The result is an architecture with resilient value given it is readily capable of evolving – offering an expedient path today to capabilities that will not be identified until tomorrow.

Gathering the Fundamentals into a Logical Model

Given a logical model is a living artifact that aids in moving a set of stakeholders towards a shared understanding and vocabulary, it does not need to be crafted all at once but rather benefits from an iterative approach.

In initial iterations, it is helpful to widely gather and organize some fundamental concerns:

A) Questions of interest – initial questions that come to the minds of stakeholders as they start to clarify the shape of the problem and envision the nature of the solution.

B) Concepts – "units of knowledge" that are of interest and meaning to the business. Each concept has a set of characteristics which ultimately are represented as facts that are analyzed and communicate as information. Concepts have specific, unique meaning, unique names, data

types, and other attributes which will later be captured in more rigorous detail. Concepts range from the abstract to the concrete and derived, they encompass quantities, amounts, metrics, rates of change, correlations ratios and other points of interest.

C) Information Perspectives – views of interest to end users that aid in understanding a collection of information and are a basis of decision making. Perspectives, unlike reports, are fluid in that a given perspective can often be derived from or morphed into yet another perspective as part of an interactive information experience. Perspectives can be categorized such as trending, variance, etc.

D) Layers and Diversity of Business and Meta Use Cases - There is a large spectrum of use-cases for XBRL; however, the narrow focus on large corporations and their annual filings has made the specifications such that companies are not willing to invest the time and resources into understanding it unless deemed necessary. Making available a model which can be understood by a more diverse set of users allows more input and usability. The intention is to create a set of archetypical uses of XBRL, as well as more easily allow a diversity of opinions to interact in the XBRL space. A logical model allows non- XBRL experts to participate in the development even though they may lack the technical knowledge to produce the specifications themselves.

Subsequent iterations will flush out how people work with the information, providing additional detail such as:

D) Workflow – the rules, routes, and roles of how information is captured, processed, disseminated, and analyzed.

E) Events – occurrences of interest and significant changes in state that have the potential to impact clients or the business.

As the logical model progresses it becomes easier to assess it for completeness, self consistency, correctness, and unambiguous. Some of the validation steps are intentionally left to later in the process given they tend to be limiting rather than expanding.

Conclusion – A Learning and Evaluation Framework

Ralph Frank in a recent paper 'XBRL - Medium is the Message' that "it is a well known fact from market research that users often simply cannot know what dramatic changes a technology might bring along." Often the greatest barrier is the lack of well thought out terminology and a conceptual model to relate an old paradigm to a new one, and ease the shift in mind set of those outside an understanding of new technology as well as a means of engaging those within.

There are likely many innovative ideas on the horizon related to XBRL. In dealing with an evolving landscape it is not a question of requirements, but rather the tools for both exploring the problem space and assessing the solution. The question at hand is how will they be understand, assessed for merit, and folded into practices of the community if not the standard itself. Currently one of the significant barriers is a lack of intuitive and widely understood conceptual tools and terminology for describing, thinking about, and sharing ideas in the XBRL problem space. The most dramatic accelerant to innovation and maturity in the exchange of information is in the simple aspect of how it is conceptualized, talked about, and evaluated . . . all of which will guide its evolution.

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