XBRL and its Adjacent XML Languages: An Overview

27 May 2002

Goal

The UK Office of the e-Envoy raised a key question: is XBRL the only XML specification on offer whose domain of discourse covers business reporting? The answer is yes, and the purpose of this paper is to supply the evidence for that conclusion. The approach taken here is to compare and contrast XBRL with other open specifications that occupy spaces that are "adjacent" to it, in the sense that they are based on XML and address subject matter that is closely related to business reporting, or that have been adopted in business processes that involve an important type of business reporting. Examples of areas adjacent to business reporting include credit and investment analysis, market data distribution, equity and derivatives trading, ERP integration, and taxation. The scope of this document addresses only open specifications (excluding proprietary but "de facto standards" such as PDF) and includes reporting related to accounting, financial, or economics.

XBRL International has always kept its focus on business reporting and has maintained liaison relationships with other open specifications consortia in related domains. Not only do many XBRL International members belong to these other consortia, but XBRL International itself has liaison relationships with MDDL, RIXML, ITPC (NewsML), SDMX, OASIS, UN/CEFACT, BUS CRD (GRE FIS), ACORD, and BITS. Consequently, in each of these relationships there has been a clear delineation of scope, and some consideration has been given to details of technical compatibility and the potential for interoperability. Where the domain of interest may overlap, agreements such as the Interoperability Pledge made by OASIS, OMG, HR-XML and XBRL (see References) tends to ensure at least that technical work is not duplicated, and at best that the specifications are truly complementary.

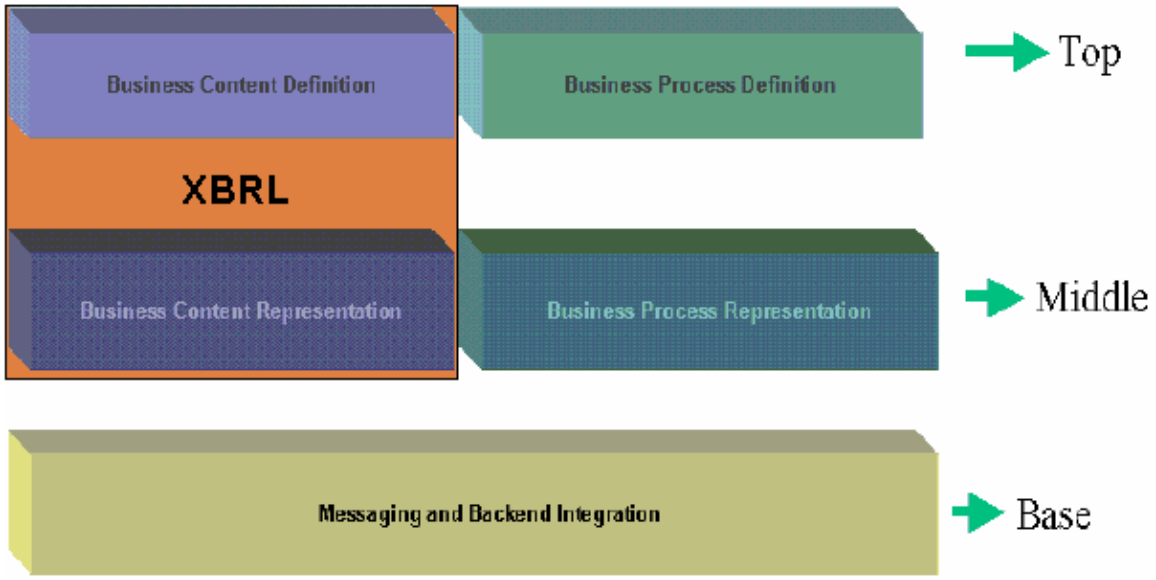
Some familiarity with XBRL is assumed in this document; introductory material can be found on www.xbrl.org, the XBRL International web site.

1. XBRL is a Content Specification

The Business Internet Consortium's Interoperability Framework provides useful context. In October 2001, the Business Internet Consortium published a framework for aligning e-business standards with one another; the high level idea is captured in Figure 1. This framework is very similar to one presented by RosettaNet in April 2001 in its call for e-business standards convergence, as well as being similar to the ebXML architecture, as well as being close to that used by Gartner Group in its analysis of standards – it is, in other words, well grounded in practice.

XBRL spans the top and middle: business content and representation. By design, XBRL versions 1 and 2 define no business processes or transport. The XBRL *representation* consists of the XBRL Schemas for instances and taxonomies; the XBRL *content* consists of taxonomies for various domains.

Figure 1. BIC Framework, with XBRL overlay © 2001 Business Internet Consortium

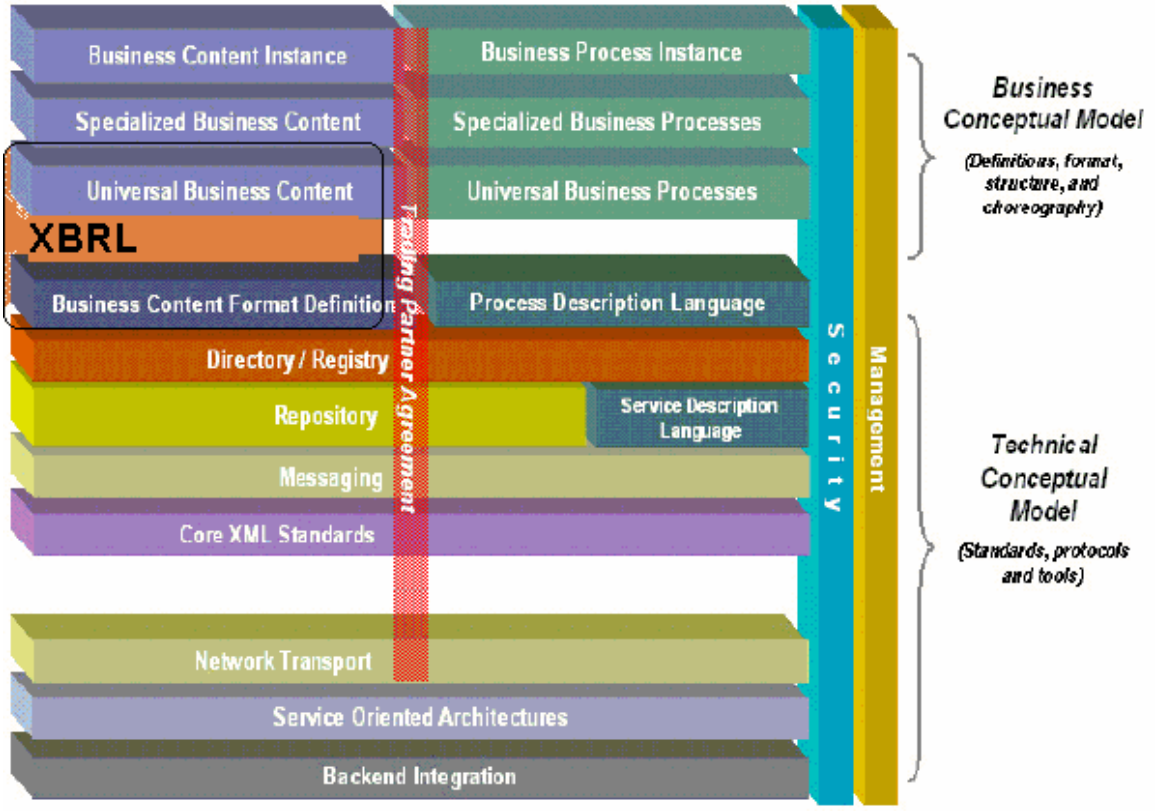


The BIC Framework distinguishes three different types of content:

- Universal Business Content – for example, content definitions having to do with widely applicable, horizontal content such as purchase orders and invoices;
- Specialized Business Content – these definitions are specific to an industry or group of companies – an Insertion Order in the advertising industry, for example, is a special document that resembles a purchase order in some ways but also includes details of the advertisement itself;
- Business Content Instance – content that is specific to a given company, for example, a TRW Credit Report.

Figure 2 identifies XBRL as a kind of "universal business content" within the more detailed architecture of the BIC Framework. We return later to the question of which of these three categories a given XBRL taxonomy is; for the moment it is certainly the case that the XBRL core specification itself, which defines meta-concepts for defining all kinds of business reporting items, is at least as "universal" as a purchase order (itself an example of universal business content).

Figure 2. BIC Framework (Detail) with XBRL Overlay © 2001 Business Internet Consortium.



XBRL is sharply distinct from standards such as ebXML simply because these standards encompass much more of the above diagram; XBRL is focused on a particular kind of business content and consequently provides far richer detail in that area than is possible in more broadly applicable standards.

1.1. XBRL is being adopted worldwide

Support for XBRL is global and comes from diverse organizations. As of May 2002, there are members of the XBRL International consortium in seven countries (United Kingdom, United States, Germany, Japan, Australia, Canada and Singapore) and active participation from at least nine others (the Netherlands, Belgium, Spain, Ireland, Switzerland, Hong Kong, Taiwan, South Africa and Denmark). This totals 140 organizations, including the Big Five, dozens of software vendors including Microsoft, SAP and Sage, several banks including Deutsche Bank and Bank of America, as well as government agencies including the US Census Bureau and the Singapore Ministry of Finance. Pilots are currently ongoing at Bank of America, Dresdner Bank, Deutsche Bank, and Moody's.

Activity within the government sector ranges from basic awareness and interest, through active design and development, all the way to deployed applications. A live application of XBRL at the Australian Prudential Regulatory Authority (APRA) in which 12,000 deposit taking institutions report quarterly in XBRL has been in operation for over a year. The Federal Deposit Insurance Corporation has developed a proof of concept application for quarterly bank financial reporting and is working with other U.S. bank regulators, the FRB (Federal Reserve Board) and OCC (Office of the Comptroller of the Currency), to deploy a completely new process using XBRL by year end 2003. At the UK Inland Revenue, the use of XBRL in corporate income

tax filings is planned for deployment in early 2003. Meanwhile, two other countries have already committed to using XBRL for online company registration, and XBRL is being studied for use in government gateways and e-government initiatives in Japan, Canada, the Netherlands, Denmark and elsewhere.

1.2. XBRL is uniquely positioned relative to other open specifications

In the remainder of this document we briefly examine – in alphabetical order – a variety of other specifications, both those that are industry specific (such as ACORD's XMLife standard for the life insurance sector) as well as those that are relevant to business reporting and potentially used within enterprises of all types (such as the Open Applications Group's OAGIS standard). In nearly every case the result of the comparison is the same: XBRL is the *only* open specification in the world that is:

- Optimized for the exchange of historical, archival business reporting data;
- Models data that is hierarchically arranged for drill-down and reported along dimensions of time, entity, and scenario (or context);
- Independent of specific industry, regulatory regime or level of detail;
- Supported by major accounting professional societies worldwide.

The absence of any other financial reporting standard having garnered the support of any of the accounting professional societies means that XBRL currently occupies, and will occupy for a considerable period at least, the unique position of being the worldwide standard for financial reporting that encompasses both internal and external reporting.

Key themes distinguish XBRL from other standards within the financial arena:

- Reports, as distinct from transactions. A purchase order, or, more precisely, the sending and acceptance of a purchase order, is a transaction; transactions are the purpose of a whole host of standards from IFX, OFX, ebXML, ACORD and others.

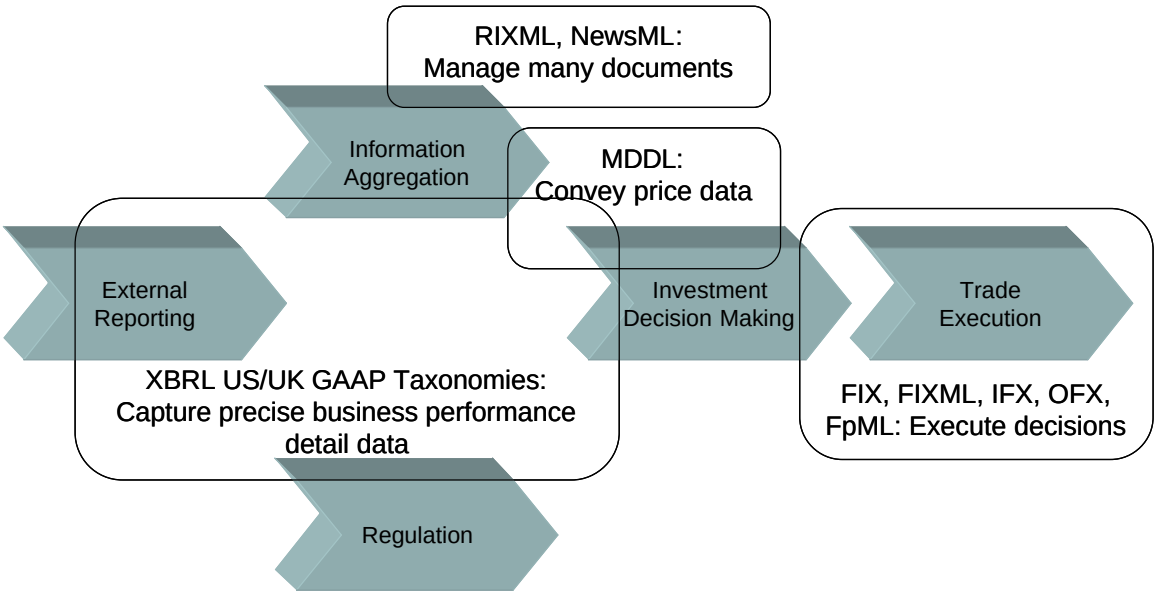
- Performance data, as distinct from market data. Market data tends to be ephemeral and real-time, with pricing being always crucial; performance data is archival and records the history of business operations and their results. XBRL is about performance data.

- Entities, as distinct from investment instruments. Equities are financial instruments whose underlying value is based on public company entities; an entity is the business itself. XBRL represents detail about entities -- not only publicly traded companies, but any business or non-profit entity. Equities and other financial instruments are the subject matter of MDDL, FpML and others.

- Reporting metadata, as distinct from document metadata. Metadata – data about data – is, for the most part, data about a document. Standards such as the Dublin Core define the data that describe a documents (which themselves contain data) taken as a whole. XBRL defines how the individual numbers and facts *inside* the financial statements and similar documents relate to one another.

In general, XBRL business content can be embedded into any other standard that is related to transactions, market data, instruments, or document metadata. For example, if there were a standard ebXML business process for tax reporting, XBRL could be used as part of the "payload" of the tax return itself, since it is used to represent financial statement level data as well as the ledger of business transactions that are classified into different tax treatments.

Figure 3. Relationship of reporting to other financial XML standards.

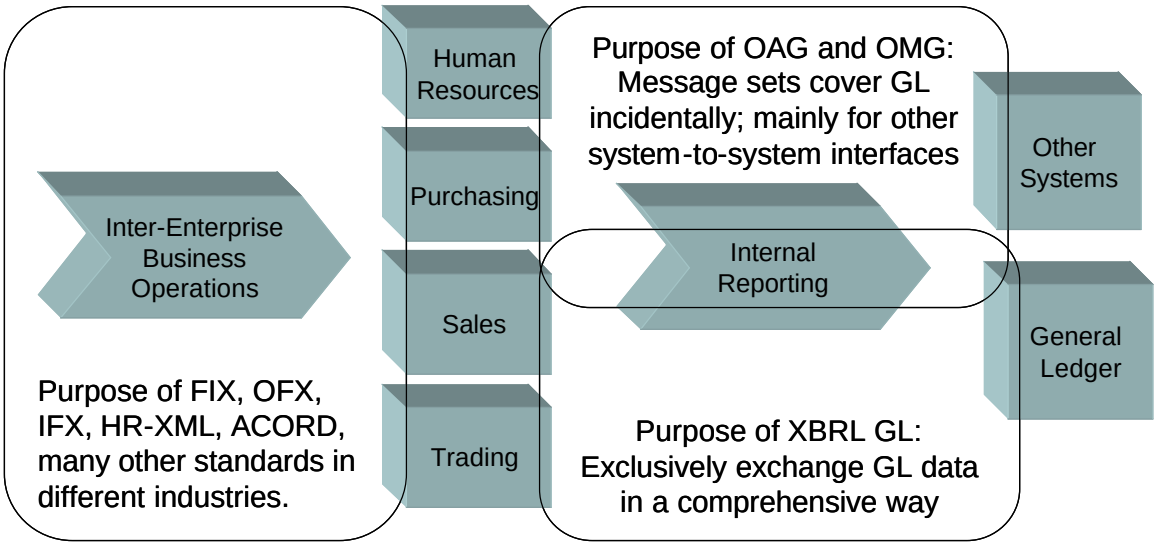


1.3. The XBRL General Ledger Taxonomy is uniquely positioned relative to other e-business standards.

Although most readers will be familiar with XBRL in general, and taxonomies for external financial reporting such as UK GAAP, US GAAP, and IAS (International Accounting Standards), fewer people are familiar with the General Ledger taxonomy which is also part of the XBRL landscape. Since several of the relationships with other open specifications relate to this particular taxonomy, a brief overview is worthwhile.

XBRL GL is a transaction-level import / export format that bridges the gap between systems that generate transactions and the general ledger where accounting data is consolidated -- and from which financial reports are generated. XBRL GL consists of a family of taxonomies for representing General Ledger data, flexible enough to cover many accounting jurisdictions. Instance documents conforming to XBRL GL taxonomies are hierarchically structured into a set of journal entries, and within each entry is a set of credits and debits as well as elements for capturing departmental, managerial, project, cost, and other forms of accounting and record keeping. XBRL GL defines dozens of elements covering the details of charts of accounts and general ledger postings, such as organization, budget items, hash totals, reversals, repetitions, depreciations, and so on. A common subset of data dictionary elements and relationships is shared with UN/EDIFACT D14 EDIFICAS data dictionary for general ledger, journal entries and charts of accounts. In the scheme of Figure 2 it is essentially a Business Content Format Definition in its own right, building on XBRL itself.

Figure 4. Relationship of business transaction standards to XBRL GL



2. XBRL and other XML Standards

In this section, other XML standards and open specifications are described in alphabetical order, compared and contrasted with XBRL:

1. ACORD (XMLife)
2. FIX and FIXML
3. FpML
4. GRE FIS (BUS CRD)
5. IFX
6. ISO 15022
7. MDDL
8. HR-XML
9. NewsML
10. OAG
11. OFX and OFX2
12. OMG Finance DTF
13. RIXML

2.1. ACORD (XMLife)

ACORD is a consortium focusing on insurance industry data exchange standards. Their open specifications, such as OLife and XMLife, are focused on enabling interoperability and exchange of data about customers, policies, risks and claims among insurance companies, underwriters, agents, and reinsurance companies. There is no ACORD standard that relates to financial reporting of business results to markets and regulators, nor is there one that is related to internal consolidation of financial results. Neither is planned at this time. Liaison discussions between ACORD and XBRL have focused on the possibility of creating a joint XBRL-ACORD working group to address this opportunity.

2.2. FIX and FIXML

The Financial Information Exchange protocol and its XML equivalent, FIXML, is a trading protocol. It supports real-time pre-trade operations such as trade

advertisement, indications of interest, orders, allocations, and news. Company reports and other multidimensional business data play little if any role at this level of trading operations, except possibly as one type of data that might be included in a FIX message.

2.3. FpML

The Financial Products Markup Language is a set of specifications intended to provide precise modeling for financial instruments – initially, swaps and derivatives – traded over the counter (rather than on an exchange). Its main purpose is to automate these trades, which are today still largely done over the telephone. The content of FpML includes detailed identification of the components of the product, as well as a language for expressing the payment streams and risk profiles of the products. It is essentially a transactional format that is quite different from that needed for a report. One of the original architects of FpML is now actively involved in XBRL, although there is no formal liaison.

2.4. GRE FIS (BUS CRD)

BUS CRD are the credit insurance standards developed by the GRE FIS community within UN/CEFACT's EDIFACT Working Group; GRE FIS is sponsored by the International Credit Insurance Association, a global industry association. XBRL International has a liaison relationship with the GRE working group to develop reporting standards for the financial reporting processes that are important in the credit insurance industry.

2.5. IFX

IFX is a transaction protocol for retail and commercial banking, including functions such as bill payment, account management, and funds transfers. Financial and business reporting plays essentially no role in IFX, although, in principle, as with all other transactional protocols, if there were a particular business process requiring the conveyance of financial reports, XBRL could provide the payload format for IFX.

2.6. ISO 15022

Version one of ISO 15022 is a specification that is an integration point to support straight-through processing in the financial trading community; it consists of almost 10,000 different data fields used to describe financial information in around 100 different transaction messages. It is essentially a data dictionary that ties together other content standards. Although not tied to XML in any way, ISO 15022 data definitions encompass SWIFT (the standard for funds transfers), MDDL, FIX and other financial XML standards, with FpML likely to be soon included in the dictionary. Thus, while ISO 15022 would not be directly used in software in the same way that XBRL would be, the inclusion of data elements from XBRL taxonomies in the accounting domain would enrich its dictionary considerably. The second version of ISO 15022 will encompass business process definitions (the right hand side of Figure 1) from other existing standards.

2.7. MDDL

The Market Data Definition Language carries data that is communicated between markets (e.g. a stock exchange), trade execution, investment management and

portfolio analysis systems. It is meant for snapshots and time series data – a "ticker" level standard – for equity and bond prices, market indices, mutual fund data, and so on, some of which is relatively ephemeral. Although not a transactional format *per se*, it is not intended for, and does not at this point have the ability to represent anything other than high level summary business performance data about individual companies. XBRL International has maintained a liaison relationship with MDDL from its inception.

2.8. HR-XML

Human Resources XML is a family of XML schemas designed to support transactions that occur between enterprises relating to HR events – temporary staffing, payroll, benefits, performance evaluations, competency grids, etc. The data represented in HR-XML relates to individual employees and supports individual transactions. An example of the relationship between HR-XML and XBRL-GL is that while an HR-XML message would carry (say) details of an individual's 401(K) eligibility between his or her employer and the administrator of the plan, XBRL-GL could be used internally at both the employer and the administrator to post summary transactions into their respective general ledgers. XBRL International has maintained a liaison relationship with HR-XML from its inception, and both are signatories to the Interoperability Pledge.

2.9. NewsML

News Markup Language is a multimedia news packaging format of the IPTC (International Press Technical Committee) to capture information about news articles and other publications at the level of author, title, date, publication, copyright, keywords, and format (i.e., is the article in plain text, PDF, XHTML, NITF, etc.), in order to support categorization, sorting and manipulation of large numbers of articles – in that sense, it is much like RIXML. NewsML is not specific to finance, but there is no reason that XBRL cannot be one of the data formats carried inside. XBRL International has a liaison relationship with NewsML.

2.10. OAG

The Open Applications Group defines a standard called OAGIS whose purpose is integrate different ERP systems within an enterprise; as such it encompasses over a hundred different integration points (transactions) relating to manufacturing, shipping, invoicing, purchases, and so on. A handful of OAG transactions relate to the General Ledger function. Insofar as it is intended for intra-enterprise usage, there is some overlap with the XBRL General Ledger taxonomy. In practice, most live implementations of the OAG standards do not include the GL related transactions, for a variety of reasons, not the least of which is that its support for international accounting conventions and practices is somewhat less rich than that of XBRL GL.

2.11. OFX and OFX2

OFX is the SGML-based predecessor to both IFX and OFX2; these are all transaction protocols for retail and commercial banking, including functions such as bill payment, account management, and funds transfers. See the notes above regarding IFX. OFX did at one time have a loan application effort which would have required a business reporting at the financial statements level to be useful (as would any similar business

transaction which reporting supports the transaction), however, this part of the OFX effort seems not to be active at this time.

2.12. OMG Finance DTF

The Object Management Group has a Domain Task Force focused on Finance; although there is an approved General Ledger interface and a proposed Accounts Receivable / Accounts Payable specification, these specifications focus on the basic mechanics of retrieval and updates, and leave open to each particular implementation essentially all questions of how to represent charts of accounts, descriptions, supporting documentation, etc. In the sense, OMG specifications are a Service Description in Figure 2, not a business content format.

2.13. RIXML

RIXML resembles NewsML in the sense that it is used to represent the metadata of investment research reports that can have essentially any media format. Thus, RIXML provides a structure for authors, publication date, etc., with a specific set of metadata for identifying which bond, security, instrument, sector or other topic the report relates to. This is a quite different purpose from XBRL, which aims to capture the detail and substance of business performance over time, which is not the same as the metadata about a document that might include that information.

2.14. SDMX

The Statistical Data and Metadata Exchange is an emerging organization that promotes standards for the exchange of econometric and related statistics among government agencies, banks and international agencies such as the European Central Bank and the IMF. SDMX's current focus is GESMES/CB, a non-XML data exchange format and protocol used by central banks for exchanging time series data such as balance-of-payments statistics. A unique feature of these standards is that they, like XBRL, are explicitly designed to handle multidimensional data. GESMES/CB is a somewhat lower level "universal business content format" than XBRL, in the sense that it represents any possible reporting dimension in terms of a set of keys ("key family" in their terminology) that can be hierarchically structured. XBRL has more semantics to it, in the sense that there are some dimensions – periods, entities, scenarios – that are built into XBRL, and there is one particular "key family" – the business reporting item taxonomy – that is the focus of several different types of relationships. XBRL maintains an active liaison with SDMX because ultimately, the raw data needed for SDMX applications comes from the granular detail provided by XBRL.

3. Conclusion

As explained earlier, there are two distinctions that are crucial to answering the Office of the e-Envoy's question, "is XBRL the only XML specification on offer whose domain of discourse covers business performance reporting?" First, there is the distinction between financial information *reporting* of a set of data and supporting text, versus the data in individual financial *transactions*. Insofar as XBRL is focused on providing a rich, detailed, comprehensive standard for representing the data used in business reporting, it stands alone – this explains the fact that there is no other business reporting standard which has garnered the support of the professional

accounting societies in several major countries. Second, there is the distinction between a *content* standard and a *process* standard. Unlike FIX and other XML standards, XBRL is completely indifferent among different process and transport standards and can be embedded in the payload of almost any other XML-based protocol. Consequently, it would appear to be a sound and well justified decision to recommend that XBRL be considered for any e-government application involving financial or business reporting, not only in the United Kingdom but at any government in the world.

References

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XML Cover Pages. http://www.oasis-open.org/cover/

Acknowledgments

Tony Coates provided bullet points related to FIX, FpML, ISO 15022, MDDL, NewsML and RIXML in his March 27th presentation, "XBRL and Financial Markup Languages." Eric Cohen, James Hartley, Chris Nelson, and David Vun Kannon provided insights about HR-XML, MDDL, SDMX, and RIXML, respectively.

Document History

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2002-05-26 [Walter Hamscher] Incorporate edits from Phil Walenga, Neal Hannon.

2002-05-27 [Walter Hamscher] Incorporate note on OFX from David Vun Kannon.