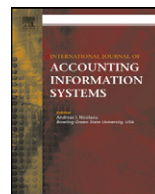




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XBRL and open data for global financial ecosystems: A linked data approach

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ABSTRACT

Information professionals performing business activity related investigative analysis must routinely associate data from a diverse range of Web based general-interest business and financial information sources. XBRL has become an integral part of the financial data landscape. At the same time, Open Data initiatives have contributed relevant financial, economic, and business data to the pool of publicly available information on the Web but the use of XBRL in combination with Open Data remains at an early state of realisation. In this paper we argue that Linked Data technology, created for Web scale information integration, can accommodate XBRL data and make it easier to combine it with open datasets. This can provide the foundations for a global data ecosystem of interlinked and interoperable financial and business information with the potential to leverage XBRL beyond its current regulatory and disclosure role. We outline the uses of Linked Data technologies to facilitate XBRL consumption in conjunction with non-XBRL Open Data, report on current activities and highlight remaining challenges in terms of information consolidation faced by both XBRL and Web technologies.

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1. Introduction

In the 2008/2009 global financial crisis many banks had to quickly try and understanding their exposure to the changing market conditions. In an examination of the role of IT in the crisis, bank employees were classified as being involved in “detective work” having to piece together financial information distributed across multiple silos (Economist, 2009). Whether internal to an organisation or across its supply

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chain, integrating financial information and data remains a fundamental challenge. Addressing the challenge requires a flexible approach to financial and business information integration with an ability to connect and consume large quantities of data sources.

The eXtensible Business Reporting Language (XBRL) standardises financial reporting and with a machine-interpretable format that makes corporate reports easier to consume and integrate. However, XBRL-based information sources only provide part of the picture, and many other data sources are used in conjunction with XBRL. As Hatsu Kim, VP Global Fundamentals Thomson Reuters, noted “when it comes to valuing companies, quarterly and yearly filings are insufficient in information terms and have to be considered together with information on markets and exchange rates (W3C, 2009).

Analysts and investors constructing detailed insight into an organisation develop their understanding through examination of a diverse range of business and financial information. Performing an analysis can require information varying from operational figures, new product announcements, risk exposure, sector spend, independent analysis and customer sentiment. The source of this information includes internal reports, social platforms, marketing briefs, regulatory filings, analyst reports, press releases, government statistics and third party information providers. Information professionals face the difficulty of how to achieve faster and more accurate analysis across these disparate financial information sources that present and behave as islands of information.

The XBRL International Standards Board (XSB) also recognises the potential of generating an integrated financial information environment, specifically noting the early stages of “*building an ecosystem in which XBRL information is generated, reported, reused, combined and analysed throughout the business community and all along the business reporting supply chain*” as also facilitating XBRL consumption (XSB, 2010).

Within the wider global financial and business information ecosystem of corporate press releases, government statistics, market press coverage and third party information providers,¹ XBRL data repositories represents yet another data silo in a global landscape of disconnected silos. Combining XBRL with the plethora of non-XBRL financial information remains at an early stage of realisation. Significant efforts are required on the part of financial information consumers to integrate XBRL data with other data expressed in a wide variety of data formats.

The last few years has seen the emergence of a “Web of Data” fuelled by Open Government transparency initiatives that have made significant amounts of public sector information freely available for use and redistribution without restriction. Notable examples within this Open Data² movement are data.gov, recovery.org (US), data.gov.uk (UK), Eurostat³ (EU), the World Bank⁴ and International Monetary Fund.⁵ The EU has also mandated that collected financial, economic and legal data sets be made available as Open Data (EC, 2003) for integration and innovative reuse with new products and services (EC, 2006). Open government data is a significant player directly supporting *data innovation*, an approach where companies analyse raw government data to better inform their own business circumstance, those of stakeholders, or the development of new service opportunity (IDG, 2009).

Semantic Web technologies and standards play an important role in sharing of large quantities of data via the Web. The resulting Web of Data enables machine interpretation of the meaning of information.⁶ Linked Data⁷ (detailed in Section 3) is a best practice approach used to expose, share and connect data on the Web based on World Wide Web Consortium (W3C) standards.

XBRL consumption is typically restricted to the transformation of entity specific reporting concepts extracted from financial statement to financial statement ratios (Debreceeny et al., 2009) that then drive analysis and insight generation. XBRL's lack of association with data external to financial statements restricts the information consumers opportunity for holistic investigative analysis of other tangible sources (e.g. company Web sites and government data, financial news, financial discussion forums). Linked Data technologies can be used to increase the association between XBRL and Open Data silos and contribute towards XBRLs consumption and exploitation potential. There have been initial efforts to combine XBRL

¹ Further examples are given in the Appendix on Web Based Financial & Economic Open Data Sets

² Refer to Appendix on Web Based Financial & Economic Data Sets for a broader list of examples

³ <http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/>

⁴ <http://data.worldbank.org/data-catalog>

⁵ <http://www.imf.org/external/np/fin/tad/exfin1.aspx>

⁶ <http://www.w3.org/2001/sw/SW-FAQ>

⁷ <http://linkeddata.org/>

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