

Semantic Interoperability in XBRL Reports via Collaborative Ontology Mappings and Linked Data Principles

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Abstract. In an increasingly digitalized world, financial institutions have become data hoarders and find it difficult to efficiently exploit and interpret data from various sources. XBRL provides a global standard to exchange financial information. Although XBRL solves the syntactic heterogeneity problem, it doesn't solve the semantic heterogeneity problem when involving multiple taxonomies. In this paper we propose a collaborative approach for mapping these different XBRL taxonomies into a reference ontology stored in our mapping repository, MappingPedia.

Keywords: XBRL, Linked Data, Mappings

1 INTRODUCTION

XBRL¹ (eXtensible Business Reporting Language) is a freely available and global standard for exchanging business information. An XBRL document consists of an XBRL instance containing the business facts being reported and a collection of taxonomies defining metadata about the business facts. Though XBRL is a good step towards efficient dissemination of financial data, it doesn't ensure semantic interoperability because many jurisdictions have developed different taxonomies making it difficult to perform cross-company comparisons [1]. Two main challenges for such comparisons are the lack of alignment between different taxonomies used and the lack of unique identifiers for companies across different sources[2]. This paper proposes the use of a collaborative mapping approach of the different XBRL taxonomies into a reference ontology, based on FIBO and Financial Regulation XBRL ontology to address the first challenge and the use of Linked Data principles to address the second challenge.

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¹ <http://www.xbrl.org/>

2 RELATED WORK

Some efforts in XBRL have been already provided by Linked Data practitioners such as [3, 2, 1] but they don't solve the heterogeneity problem involving multiple XBRL taxonomies. EDOAL allows representing complex correspondences between the entities of different ontologies. These correspondences can be represented in XML or RDF. MappingPedia² [4] provides a collaborative environment facilitating the discovery and request of development of mappings by other users.

3 METHODOLOGY

Given an XBRL document $d = (i, t)$ that consists of an instance i and a collection of taxonomies t , the process of generating the corresponding linked data (as illustrated by Figure 1) is:

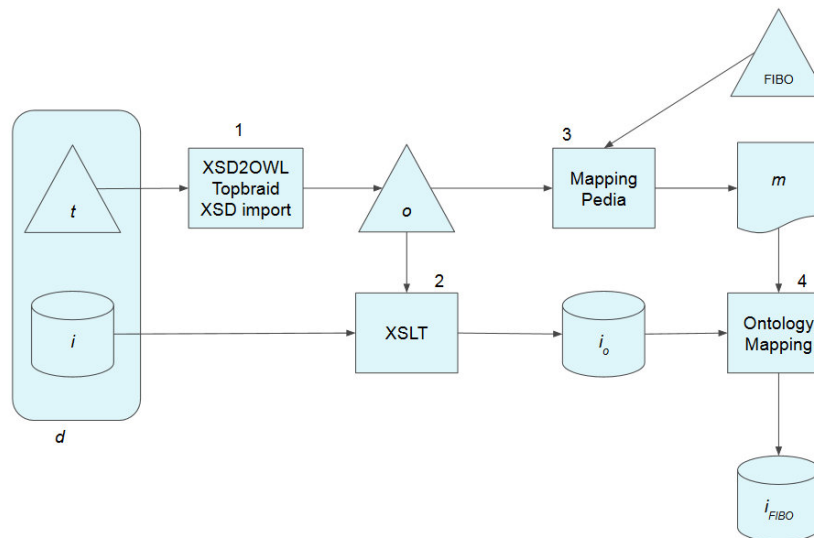


Fig. 1: Methodology

1. Generate the putative ontology o reflecting the taxonomy t using tools such as Topbraid composer.
2. Transform i into i_o conforming o using any XSLT engine.

² <http://demo.mappingpedia.linkeddata.es/>

3. Find the corresponding EDOAL mapping m for the ontology o in MappingPedia. If the mapping exists, go to step 4, otherwise, create/request the mapping on MappingPedia.
4. Use any ontology mapping engine to transform i_o into i_{FIBO} .

4 CONCLUSIONS

We have presented an initial approach for alleviating the heterogeneity problem between XBRL taxonomies. The main contributions of our paper are: a methodological approach for generating mappings among the different XBRL taxonomies and a technological infrastructure of a collaborative mapping environment. During the poster session we will present some examples and the potential evaluation of the methodology.

References

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