XBRL AND THE MULTIDIMENSIONAL DATA MODEL

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ABSTRACT:

Nowadays, there is an important development in XML and Data Warehouse (DW) applications. Moreover, companies and financial institutions need more accounting information. In addition, this information must be reliable and on time. XBRL (eXtensible Business Reporting Language) is a global de facto standard, based on XML. XBRL consists of a set of taxonomies, which define different accounting regulations of a specific report. XBRL reports are created from various sources and are validated at source. XBRL represents business information, and it is multidimensional, and therefore the logical destination is a DW. This paper analyzes the data model of XBRL and its semantics, and how to map this data model to the Multidimensional Data Model (MDM), and in turn to the Logical Model, either ROLAP (Relational OLAP), MOLAP (Multidimensional OLAP), or HOLAP (Hybrid OLAP), so they can be analyzed by business users.
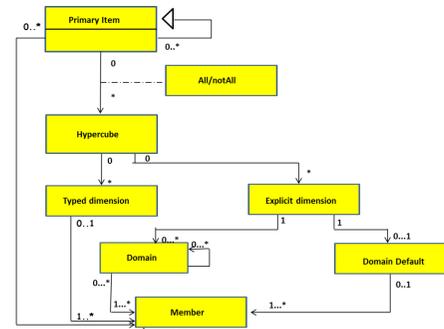
Figure 2.- Design the XDT model with UML

XBRL REPORTING LANGUAGE

XBRL is a XML-based standard for financial reporting. Charles Hoffman, in April 1998, proposed to automate the exchange of financial information, and he developed the first version.

A financial report is based on accounting rules such as International Financial Reporting Standard (IFRS), Basel II, Basel III, and so on. These rules change with time, and it can have different versions, depending on the country. Then, we have version problems.
These standards may be international, national, local, by company or financial institutions. This set of rules can be inherited or overwritten.

A report consists of an XBRL instance, which is the report itself, and this report has a set of XML Schemas or XBRL Schemas, and, they make up Discoverable Taxonomy Set (DTS). Each XBRL Schema may or may not have up to eight roles, called linkbases (Figure 1).
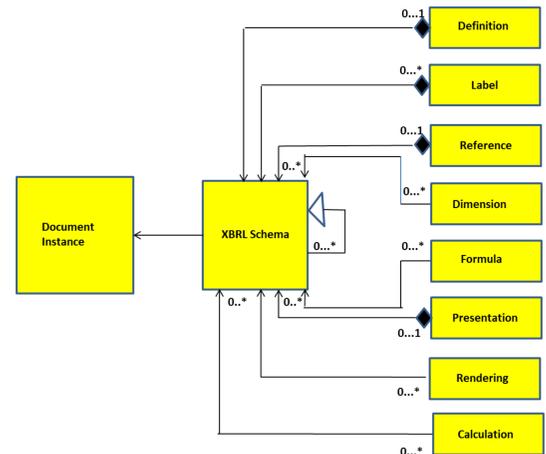
XBRL Dimensional Taxonomies (XDT) consists of dimensions, domains and hypercubes. Figure 2 shows the chart with this specification.
We propose to develop a process of transformation of XBRL metadata, to metadata for a multidimensional database (MDM) figure 3.
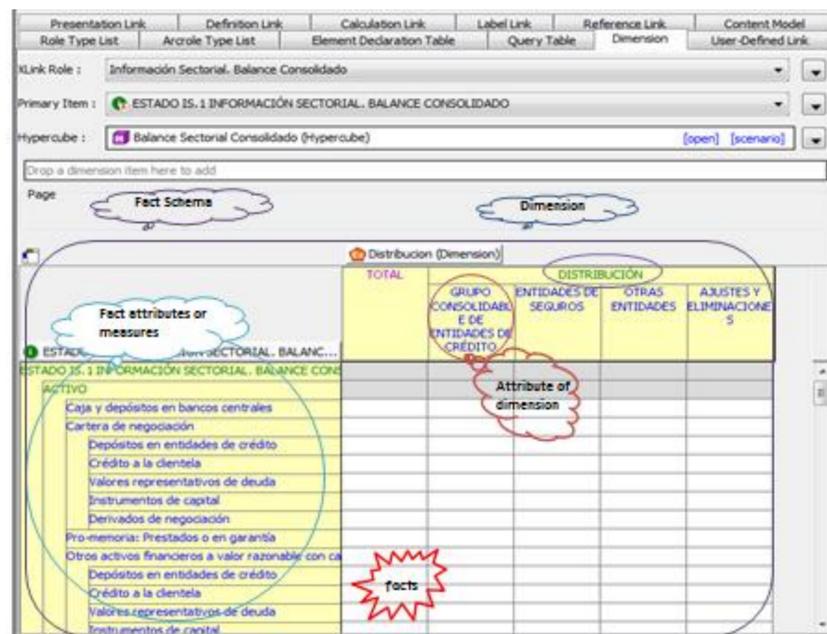

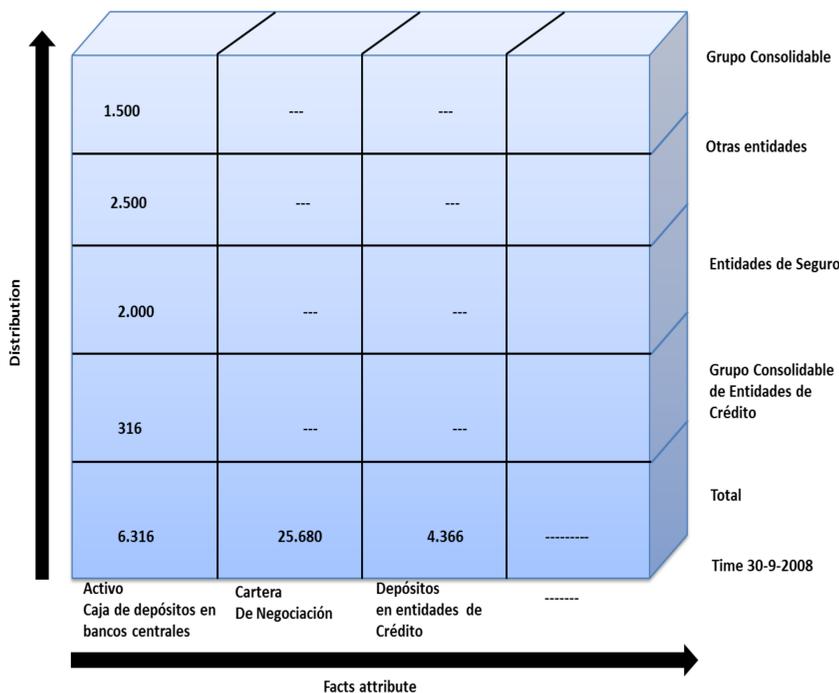Figure 4.- View of Dimensional table with Xwand of Fujitsu.

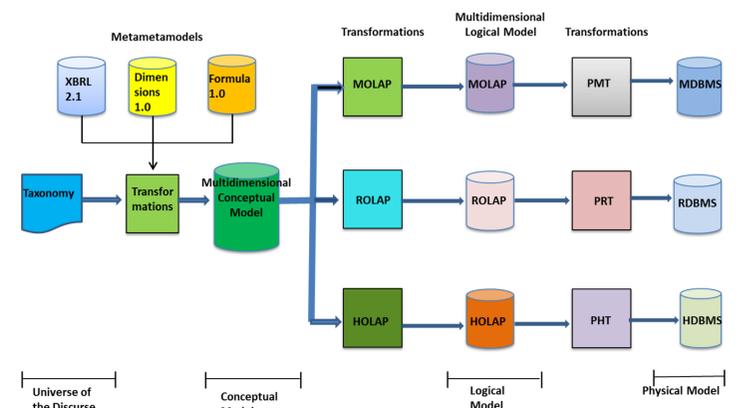Figure 1.- UML design of XBRL Schemas and linkbases (DTS).

Figure 3.- Global transformation of the XBRL metamodel

EXAMPLE GUIDE

Our example is based on the 6610 report (Public Sector Consolidated Balance report). Spanish banks send this report to the Supervisor, the Bank of Spain. In figure 4, is shown with the help of Fujitsu's Xwand tool, the dimensional view of the 6610 report. In figures 5, 6, and 7, we show a graphic representation of the multidimensional relation, a graphic dimensional, and the Multidimensional Data Model.
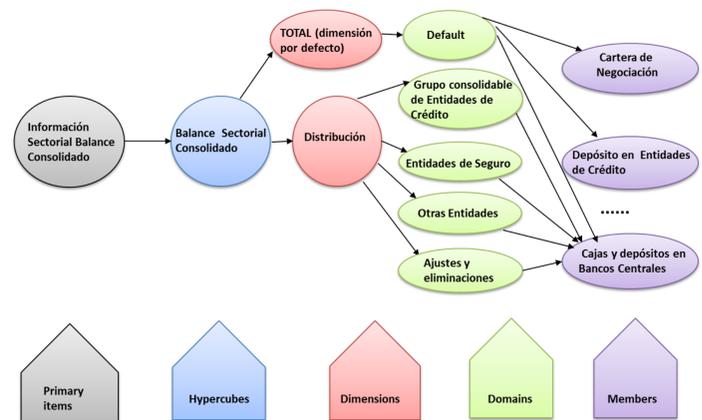

Figure 5.- Graphic representation of the multidimensional relations of the 6610 report (IS1. Public Sector Consolidated Balance).
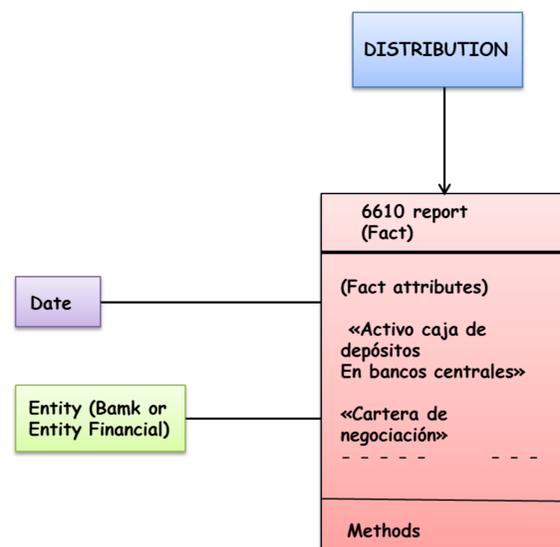

Figure 6.- Dimensional graphic of the example 6610 report (Public Sector Consolidated).

Figure 7.- Multidimensional Data Model of the 6610 report.

CONCLUSION

We have demonstrated that the XBRL reports are dimensional and these can be transformed and automated in an MDM. We want to build an abstract data model, and analyze it, semantically. Ongoing work with the creation the necessary infrastructure of the automation process and its development. And, finally, we want to analyze your performance in each of the stages, and in its entirety.