COLLABORATIVE DEVELOPMENT OF I.T. SUPERVISORY FRAMEWORKS

Ignacio Boixo and Katrin Schmehl, co-coordinators of the XBRL Operational Network chronicle the search for a common reporting taxonomy in Europe and the role of XBRL in the new Eurofiling initiative.

I. Background

At the end of 2004, the CEBS COREP[1] Network provided a set of very complex but harmonised European tables summarising the implementation of Basel II to a group of IT experts from different National Supervisors. The requirement was to create a common European IT data format representing the tables provided and containing up to 40,000 possible cell combinations. The set of Excel tables defined reportable financial business data, validation rules, specific views of the data and potentially, multi-lingual capabilities.

The initial decision made was the adoption of an IT reporting standard. The usage of a standard allows access to the best results of science and technique and reduces the effort required for the creation of proprietary solutions, which are probably poorer and more primitive. With each new member of CEBS that adopts the standard, the spread of this technology increases and eases the interoperability. Standardisation increases efficiency and minimises market risks.

The standard selected was XML (Extensible Mark-up Language) from the World Wide Web consortium, widely used on the Internet. XML is widely accepted and has the advantage of extensibility, to enlarge the basic XML features and thereby, accommodate the specific user requirements. The group then

[1] CEBS: Committee of European Banking Supervisors. COREP: COmon REPorting (Basel II Pillar I) FINREP: FINancial REPorting (IFRS). Both frameworks are developed for European Banking Supervision.

Katrin Schmehl, Coordinator, Committee of European Banking Supervisors, XBRL Operational Network

Ignacio Boixo, Coordinator, Committee of European Banking Supervisors, XBRL Operational Network

analyzed the best way to use XML (i.e. proprietary XML, SDMX, XBRL).

If the user requirements are not very complex or the number of participants is low, the cost to customize or extend raw XML in a proprietary way is very reasonable. However, in the case of COREP, due to both its complexity and pan-European scope, a huge work effort was needed to extend the raw XML standard to fulfill complex user requirements, starting from scratch. This is a common situation, and hundreds of specific XML extensions have been developed for specific purposes. The golden rule is "Don't Invent XML Languages", similar to "Don't reinvent the wheel".

The XML statistical extension SDMX (Statistical Data and Metadata Exchange) is an ISO standard, supported by multinational institutions (BIS, ECB, EUROSTAT, IMF, OECD, UN & World Bank), and widely used in financial statistics. SDMX provides a good tool to cover the multidimensionality of the COREP tables, but lacks in features specifically oriented to primary reporting, such as some validation rules, multi-lingual capabilities or presentation.

The XML business reporting extension XBRL is an industry standard, supported by Supervisors such as Securities and Exchange Commission (SEC)-USA, Federal Deposit Insurance Corporation (FDIC)-USA, Bank of Japan, IFRS-IASB, Companies House-UK, HM Revenues and Customs-UK, and many others as shown at ***www.xbrlplanet.org*** XBRL was specifically designed to cover reporting requirements such as validation rules, multi-lingual capabilities and a presentation definition. The most important advantage is the role of the not-for-profit XBRL International Consortium, which is in charge of developing new features and extensions to cover upcoming user and business requirements.

The kick-off meeting in February 2005, under the guidance of Pierre-Yves Thoraval, COREP Chair, Adrian Abbot of the UK-Financial Services Authority and Frédéric Marié, Banque de France, lasted for two weeks with a group of around fifty volunteers, including several international XBRL experts, such as Charlie Hoffman and Walter Hamscher. It agreed on the use of XBRL and discussed how to apply XBRL to support COREP. Missing required functionalities were analysed, especially, more dimensional features. A solution path was found, CEBS XBRL Network started operations and the standard was accordingly extended by the XBRL International Consortium.

The CEBS, in both the Cover Note to the *Framework for Consolidated Financial Reporting* (December 2005) as well as to the *Framework for Common Reporting of the New Solvency Ratio* (January 2006), stated:

"While national supervisory authorities are free to decide on the technical transmission specifications to implement the reporting framework, CEBS considers that XBRL can be a helpful tool in constructing a harmonised European reporting mechanism. CEBS will therefore develop an XBRL platform and make it available free of charge to national authorities and supervised institutions. XBRL taxonomies will be developed for both the COREP and FINREP (Financial Reporting) frameworks."

COREP was developed as a primary taxonomy, independent of any other, being the first taxonomy to use dimensions (tables for XBRL). FINREP was developed in parallel as an extension of the IFRS XBRL taxonomy, already developed by the International Accounting Standards

Board/IFRS Foundation. The first production CEBS XBRL taxonomies for COREP and FINREP were released on time (September 2006) and on budget (0 € – in house).

II. Main requirements for IT Supervisory filing

Validation applicable both at source and destination: Validation of reports inside the supervised institution prior to filing is extremely useful.

A classic solution is that the Supervisor provides an IT reporting program to the supervised entities, but this is at the cost of transforming the Supervisor into a software provider, creating additional problems when deploying and updating such software. Moreover, creating a European-harmonized IT reporting program was outside of the mandate. As a consequence of publishing the IT formats only, the IT information systems in the supervised and supervisor sides may not always exactly follow the same validation rules. The underlying IT reason is that the validation program in the source and the validation program in the destination are programmed by different IT teams in different IT environments. A number of validation failures are undetected in the source (false negatives), and then the Supervisor must resort to sending error messages to the supervised institution, wasting effort and time. Sometimes the source IT program rejects correct reports (false positives), creating confusion and delays in the supervised institution.

Common validation, both at source and destination, is a well-known problem since the very beginning of IT implementations. It has been addressed with portable programming languages such as Cobol, Java or .Net, that presumably run equally well on different computers. In any case, deploying these kinds of programs is also likely to transform the Supervisor into a software provider. That created additional complications.

The XML solution to validate reports is achieved by using XPath and XQuery expressions. Unfortunately, such a technology is very complex and only suitable for specialized experts. The recent (2009) XBRL Formula extension encapsulates XPath and XQuery complexity, and has already proven to be effective in banking supervision of the U.S., Japan, France, Spain and now, worldwide.

FINREP and COREP new taxonomies will be released with the complete package of Formula to allow common validation on both the source and destination (supervisor) sides.

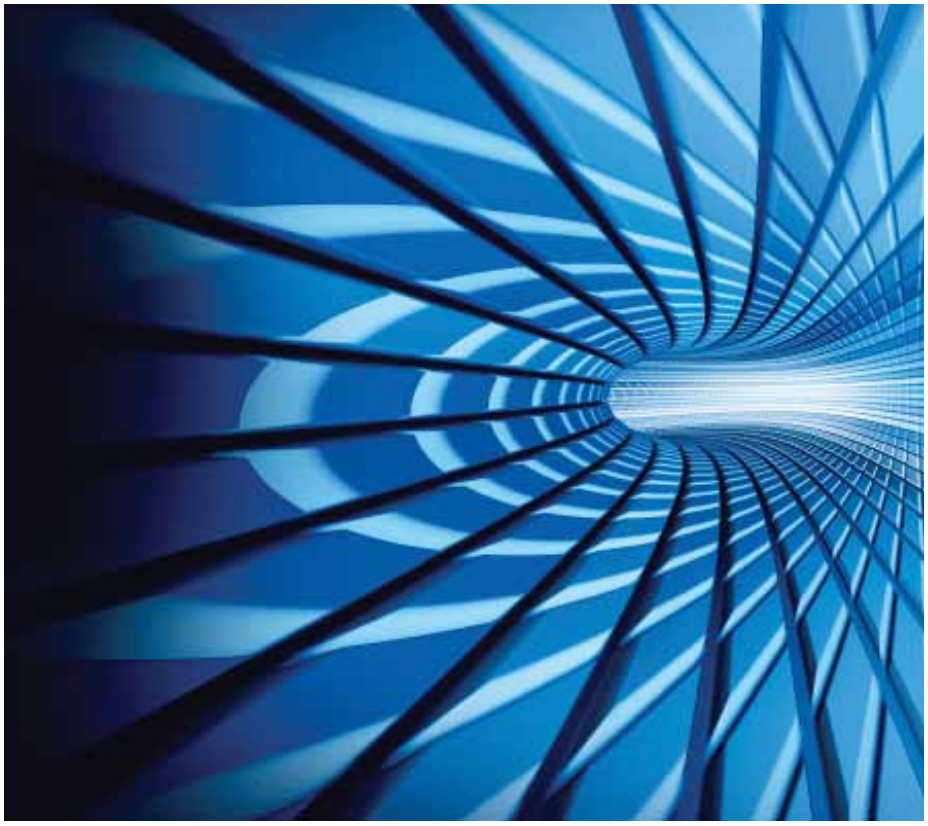
Dimensional (table oriented) reporting: Supervisory frameworks are usually very large. COREP has about 40,000 different elemental cells. Enumerating all those 40,000 cells is non-practical. The classical solution is to use tables (as Excel spreadsheets that make the management of the supervisory framework much easier). Even more, a table could be reused with different scope (i.e. IFRS/CRD, obligor grade, currency and so on). At the end of the data modelling process, the complete framework is expressed as a relatively short list of measures (primary items in XBRL terms) that are combined with a number of applicable breakdowns (dimensions in XBRL terms). This follows almost the same approach as modelling relational database structures.

In addition to the inherent XML tree structures, a table approach has been created as XBRL Dimensions. This is the approach used in COREP and FINREP supervisory frameworks. The structure of XBRL Dimensions is particularly useful when mapping (establishing connectors between the IT information system and the XBRL report) with relational databases (RBDMS), online analytical processing (OLAP) or open database connectivity (ODBC). Therefore, it is now very easy to map relational databases to/from XBRL dimensional reports.

Formal data model: Supervisory Frameworks are oriented to experts in supervision, not necessarily to IT experts. The framework is published as guidelines plus Excel tables, which are not exactly a formal data model in IT terms. A very important phase is to formalize the supervisory framework into a formal IT data model. This work is to be carried out with IT experts in close collaboration with supervisory experts.

> "A very important phase is to formalize the supervisory framework into a formal IT data model."

The formal data model may be expressed with any kind of notation. In the COREP and FINREP frameworks, the data model is presented with a notation of matrix schema – a notation traditionally used by the Bank of Italy. A further refinement is the data point structure, developed in the Eurofiling Initiative. The data point structure is simply a set of Excel spreadsheets that describes



the breakdowns applicable to each primary item. The formal data model is very useful to design relational data bases as well as reporting formats, irrespective if they are CSV, XML, XBRL or any other format.

In terms of costs, the generation of the draft 2012 FINREP XBRL taxonomy from the FINREP data point structure was quoted at 25,000 €.

Long-term approach: Most of the technologies being used today were only ideas and speculations when the CEBS XBRL Operational Network started operations in February 2005. It was decided to join a main stream technological organization, in order to have a long-term technological path.

CEBS is a front-runner in using technology based on standards. As the budget from 2005 to 2008 was established in 0 € /year, using royalty free standards was the only suitable solution. The first implementations in XBRL dimensions and XBRL formulas were tested and carried out by CEBS members. XBRL standards have benefited from the advice and contribution of CEBS experts. Further standards have been requested, of which the most important are:

- **Versioning:** when a supervisory framework changes, the IT formats should change accordingly. Providing a formal IT report about the changes from one version to another is of the utmost importance within proper change management. It is expected to have a reduction of cost when the mappers (programs to extract and map data from the supervised information system and generate supervisory reports) will be more automated.
- **Rendering:** the way in which the reporting data is transmitted and is presented is quite different. The transmission is oriented to an application channel, but the presentation is oriented to users. When using the report prepared for transmission, it is important to have a standard way in which the reporting data is presented to the users. Currently there are different views on this topic. The US/UK prefer to define a couple of rules which provide some degree of freedom in the presentation of the information included, whereas the continental European countries have to follow a fixed format according to their Directives and national laws.

Common Methodology: A large number of Supervisors worldwide are using XBRL. Lessons learned are distilled into a common methodology. When a new supervisory framework is to be developed, this knowledge base is applicable, increasing the quality of the project and reducing the cost. Since 2005, the common efforts of the CEBS XBRL Operational Network have created a common methodological way for supervisory reporting projects. The software industry in Europe has benefited from these efforts and other experiences by providing software, consultancy and solutions for supervisory reporting systems. Aside from XBRL, no other common business reporting language exists worldwide.

Harmonization between reporting frameworks: Supervised institutions do not report to one single Supervisor. Typically, cross border financial institutions must report to different national Supervisors about different activity areas, such as banking, insurance or securities. Some efforts, such as the Joint Expert Group on Reconciliation initiative, have been carried out for reconciliation at the reporting

level. At the IT level, other efforts will be done, provided the reporting formats are compatible. IFRS, FINREP and EMU statistics have some commonalities at the IT reporting level: commonalities that are being explored and raised into the Eurofilling Initiative.

The solution should be consistent with any format and XML dialect: Each Raw XML project or development creates a de facto dialect to a lesser or greater degree. When the XML application is confined to reduced and controllable boundaries, this is not a problem, however, for large XML reports to be used in thousands of implementations, the situation is a bit more complex.

A typical solution is to embrace an established common XML dialect (as XBRL) and create converters from any other XML local dialect or any other format. A widely used solution for XBRL is to develop a converter from selected legacy/proprietary/local formats (e.g. CSV, flat file, problem-oriented XML, manual data entry, Excel, Access, etc.) and generate an XBRL report. A quick and dirty (and therefore NOT recommended) IT solution appears to be replacing text into a sample XBRL report used as a pattern (obtained from the XBRL documentation), which would be particularly easy for COREP and FINREP pure XBRL dimensional reports.

The XBRL report may also contains embedded pieces of information in PDF (qualitative information), JPG (images), XML (manifesto of files) or any other format. This solution is very common in the Business Register, in order to include the audit report as a PDF document with the handwritten signature of the auditor.

Depending on the complexity of the converter and the number of different inputs affected, the experience on public tenders shows that the quotation is usually below 100,000 €. Cheaper solutions are available in the market, but require usually more involvement for each user in each implementation. An evident economy of scale is when an association of supervised entities, or the Supervisor, or the government, provides or subsidizes converters for different cases. Such converters are developed by commercial companies and sometimes made freely available for the users.

> "Most Supervisors that work together in IT reporting formats are part of the not-for-profit XBRL International Consortium."

III. Conclusion

Working together in Europe: Most Supervisors that work together in IT reporting formats are part of the not-for-profit XBRL International Consortium. National XBRL jurisdictions are sometimes chaired by a national Supervisor. XBRL Europe is hosted by the Federation of European Accountants (FEE) and has several Supervisors on the Board. Nevertheless, participation in XBRL supervisory groups does not require any membership of XBRL organizations. Moreover, the XBRL organizations are a symbiotic

way for national Supervisors to attract expertise and solutions, while the software and consultancy industry in Europe increases the competitiveness. This collaborative framework provides enough critical mass to the reporting frameworks, which allows Europe (more than each individual country) to develop international competitive IT reporting solutions. The SAP-XBRL use case, a part of a 2.4 million € MONNET project, concerns cross-lingual business intelligence in companies and financial services. According to an impact assessment performed by a consortium of consultancy firms in the EU project on reduction of administrative costs, the possible reduction in reporting burden in countries that do already make use of XBRL is 20%, whereas the reduction potential is 35% in countries where XBRL is not used yet.

Collaborative framework: The kick-off meeting of the CEBS IT reporting project lasted for two weeks and was attended by 50 experts. Since 2005, the CEBS XBRL Operational Network hosts two workshops per year, usually two days in duration, with an average of 50 attendees. Most of the attendees are commercial companies or supervised institutions. The common results are banking supervisory frameworks created with the collaboration of all the stakeholders. The brand name of this initiative is Eurofiling ***(www.eurofiling.info)***, with the intent to create a collaborative framework in Europe, oriented toward supervisory filings, and open to the participation of Supervisors, financial industry, industry providers and any other stakeholders interested in contributing. This Eurofiling initiative is oriented to be subordinated to the recently created European System of Financial Supervisors (ESFS), in order to improve the reporting frameworks in Europe, leveraging IT standards and best practices. ■

About the authors: *The kick off meeting of the XBRL Operational Network of the Committee of European Banking Supervisors was held in February 2005. Ignacio and Katrin are still serving as coordinators. More details at www.eurofiling.info and contact at info@eurofiling.info*

References

1. Apostolou, A. Nanopoulos, K (2009). "Interactive financial reporting using XBRL: An overview of the global markets and Europe" *International Journal of Disclosure and Governance,* 2009, Vol. 6, No. 3., pp. 262-272.
2. Bonson, E. (2008). "Solvency II and XBRL: New Rules and Technologies in Insurance Supervision" *Review of Economic and Business Studies*, issue 2, pages 35-49, November. http://rebs.ro/resource/REBS_2/Essay/Bonson_E_-_Solvency_II_And_XBRL_New_Rules_And_Technologies_In_Insurance_Supervision.pdf
3. Boixo, I., Flores, F. (2005). "New Technical and Normative Challenges for XBRL: Multidimensionality in the COREP Taxonomy" *The International Journal of Digital Accounting Research* Vol. 5, N. 9, p. 79-104. http://www.ijdar.org/volume-previous-volume-5
4. Bray, T. (2006) "Don't Invent XML Languages". http://www.tbray.org/ongoing/When/200x/2006/01/08/No-New-XML-Languages
5. CapGemini, Deloitte, Ramboll (2009) "Detailed Recommendation on the Financial Services Priority Area. Harmonise the use of XBRL for prudential reporting" *EU project on baseline measurement and reduction of administrative costs.* http://www.eurofiling.info/documents/090331%20Impact%20Fiche%20Financial%20Services.pdf
6. Debreceny, R. Felden, C. Ochocki, B. Piechocki, M. (2009) "XBRL for Interactive Data: Engineering the Information Value Chain" *Springer publisher*
7. Hoffman, C. Watson, L. (2009) "XBRL For Dummies" *For Dummies publisher*.
8. MONNET - Multilingual Ontologies for Networked Knowledge. E.C., 7th Framework Programme. http://cordis.europa.eu/fp7/ict/language-technologies/project-monnet_en.html
9. Piechocki, M. Felden, C. Gräning, A. Debreceny, R. (2009) "Design and standardisation of XBRL solutions for governance and transparency" *International Journal of Disclosure and Governance* Vol. 6, 3, 224–240. http://www.palgrave-journals.com/jdg/journal/v6/n3/pdf/jdg20099a.pdf
10. Piechocki, M. Felden, C. Gräning, A. (2007) "Multidimensional XBRL Reporting" Technische Universität Bergakademie Freiberg p. 1953-1964. http://is2.lse.ac.uk/asp/aspecis/20070133.pdf
11. Schneider, B. (2010) "XBRL Should Be Adopted for the Solvency II Insurance Framework" *Data Interactive from Hitachi,* http://hitachidatainteractive.com Posted on 20 May 2010.
12. XBRL Europe and XBRL International: www.xbrl.eu and www.xbrl.org