SUPERVISING MODELS:
XBRL AND DATA POINT MODELLING

By MICHAL PIECHOCKI, Business Reporting – Advisory Group

MICHAL PIECHOCKI OF THE BUSINESS REPORTING – ADVISORY GROUP DISCUSSES THE REVOLUTION IN DATA MODELLING HIGHLIGHTING HOW THE INTRODUCTION OF XBRL PAVES THE WAY FOR THE DATA POINT MODEL FOR ENHANCED SUPERVISORY REPORTING.

In 1974 Niklaus Wirth, a Professor of Informatics at ETH Zurich, coined a famous statement that:

ALGORITHMS + DATA STRUCTURES = PROGRAMS

Back then, data structures were seen as one of the key components of future operational applications of IT.

REGULATORS LOVE FORMS

Fast forward almost 40 years and we find ourselves in an information technology age where data structures' considerations evolved rapidly into distributed, ontological and semantic networks, big data issues, data transformed into knowledge and information in every area of life, not to mention its application for the globalised financial world. For instance, globalisation paved the way for financial markets to introduce standards for electronic data collection, processing and analysis. However, if you look closely you may notice a strange gap between how data structures are developed by market participants and how they are created for informational purposes in banking, insurance and capital markets supervision. A common factor in the development of data requirements and transformation of those requirements into information technology taxonomies is apparent: regulators love forms.

Even in the digital age, forms are regularly used by central banks, financial supervisory authorities, securities, insurance and pension funds commissions and other regulators as a means of fulfilling their appetite for information. Furthermore, forms (or templates) are most commonly used as a visualisation mechanism for information collection systems. This is primarily due to the fact that tables are considered the easiest and most user-friendly, graphical way of communicating what should be reported on two-dimensional carriers (like screens, paper or PDF documents). Another reason may be that what needs to be reported is defined by business experts, who are accustomed to more traditional means and tools. Whilst form-centric communication of supervisory information requirements may be thought the simplest, it is actually causing challenges including (but not limited to) inconsistencies of definitions and duplications across forms, further analysis of multidimensional data and data dictionary maintenance and change management.

NEW APPROACH: DATA POINT MODEL

In late 2008 there was a move away from the form-centric approach, when the Eurofiling Group[1] embarked on development of a new methodology for definition of supervisory information models, called the Data Point Model (DPM).

As Ignacio Boixo, a long-term coordinator of the Eurofiling Group notes: "*Back then the Eurofiling Group was successfully promoting the former COREP (Basel II) and FINREP (Financial Reporting) XBRL taxonomies and we realised that a new approach was required. Drawing from collective European Banking Supervisors' experiences and specifically from the Matrix Schema approach used for years by the Bank of Italy, together with the Business Reporting – Advisory Group (BR-AG), we decided to develop a new FINREP taxonomy following a data-centric paradigm and tried to identify every single business characteristic applicable to FINREP templates.*"

During 2009 Michal Skopowski and Bartosz Ochocki, co-authors of the DPM methodology, continued with two parallel activities:
1. Identifying the business approach to documentation and resolution of sometimes

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[1] THE EUROFILING GROUP IS AN OPEN, JOINT INITIATIVE OF THE XBRL OPERATIONAL NETWORK OF THE EUROPEAN BANKING AUTHORITY, WWW.EUROFILING.INFO

conflicting definitions across FINREP templates, and

2. Analysing requirements of and the impact on the XBRL taxonomies' architecture supporting the new approach.

Michal Skopowski says, "*The key challenge was to analyse the underlying business assumptions and translating implicit business understanding of the templates into a precise, logical, explicit and unambiguous data model. We needed processes, tools, assumptions and most importantly continuous discussion with a broad, multi-stakeholder business experts group to cross-check our findings.*"

The technological front also experienced challenges. According to Bartosz Ochocki: "T*he Dimensions 1.0 specification enabled a mechanism to describe multi-dimensional breakdowns; however, few projects before tried to include such a number of dimensions in one combination. Our goal was also to create a methodology that would be technology-neutral. All that posed challenges – especially in the context of solutions allowing users to test the new approach.*" However, eventually in late 2009 the new taxonomy was published for comments and the DPM methodology caught the attention of supervisors worldwide.

In essence the DPM methodology is an approach of defining a logical, explicit, unambiguous and precise data model, based on information requirements expressed in templates and supervisory legal acts. Firstly, the business experts, authors of templates and legal regulations, are asked to identify the general purpose of each table or disclosure paragraph. Next, they define the characteristics of each and every cell on the template or principle from the standard. Subsequently these characteristics are organised into consistent and logical breakdowns. Finally, the breakdowns are analysed, duplicates and ambiguities are resolved and they are combined back to reportable items or data points.

The three layers of DPM: (i) dictionary, (ii) functional and (iii) visualisation correspond with

XBRL taxonomies: (i) primary items, dimensions and domain members, (ii) hypercubes and (iii) rendering linkbase.

EXPERIENCES, CHALLENGES AND BENEFITS
Identification of consistent business requirements may sound easy and not particularly innovative. However, as Carlos Rodriguez, FINREP Coordinator, who was fundamental to the development of FINREP DPM, points out: "*The DPM is a methodology that allows the business experts, who often come with different interpretations, to reach an agreement about the characteristics of data included in the templates and to communicate them to the IT team. In my opinion, description of a template through the DPM methodology is an elegant and comprehensive way to convey its content as well as relationships with other templates. One look at a given template, analysed with the DPM, is worth many pages of lengthy explanation of its contents.*"

Bramudija Hadinoto, Director of Information Systems Management Department of Bank Indonesia, a regulator that uses DPM across all reporting domains including Islamic Finance, highlights similar experiences: "*When IT departments ask business departments for meaningful and consistent definitions they often get mixed responses. We plan to use the DPM to organise our communication of reporting requirements across the entire organisation in a clear and precise manner.*"

Experience shows that use of the DPM methodology may result in a revamp of the scope of information collected from reporting entities. "*In our case, the use of DPM in the construction of the XBRL taxonomy for banking institutions will improve information requirements, reducing the duplicates and allowing a more consistent and organized structure of data, self-described by the characteristics previously defined,*" says Jacqueline-Isabel Talledo, Analyst at the Banking Supervision of Peru.

Among the largest adopters of the DPM methodology are the European Banking Authority (EBA) and the European Insurance and

Occupational Pensions Authority (EIOPA). Andreas Weller, Head of IT at EBA, announced at the XBRL International Conference in Abu Dhabi that: "*The EBA goal is to make the DPM model along with the respective XBRL taxonomies, the obligatory, central solution describing European banking sector supervisory information requirements. We also expect the DPM to improve management and update of changes to allow the EBA to promptly respond to changing market demands.*" [2]

The EBA sister organisation, EIOPA, is also planning to use the DPM: "*The Solvency II directive requires comprehensive data sets. Our assumption is that with the DPM we can provide a layer describing these data sets in an explicit and unambiguous manner to assist the national insurance supervisors and reporting entities across Europe,*" says Pierre-Jean Vouette, Special Advisor at EIOPA.

For Solvency II the expectations from DPM are already growing as John Dill, CIO of the Bermuda Monetary Authority (the supervisor who authored the first Solvency II DPM-based XBRL taxonomy) highlights: "*We believe the data points to be a mechanism not only for Pillar III Solvency requirements but also a facilitator of Pillar II (ORSA) XBRL reporting framework enabling connection of GRC-type information with supervisory data sets.*"

While it seems that the DPM methodology is increasingly used to consistently describe reporting requirements, it may also be able to fulfil the needs of supervisory information analysis. "*Working with a national regulator, we found out that the DPM breakdowns allow for advanced analysis of cross-template and cross-sector information using the business intelligence software. It clearly has the potential to enable and improve the systemic risk analysis,*" says Maciej Piechocki, of Cundus AG.

[2] HTTP://ARCHIVE.XBRL.ORG/24TH/SITES/24THCONFERENCE.XBRL.ORG/FILES/ BNKG5ANDREASWELLER.PDF

NOT ONLY SUPERVISION

Interestingly the logic of DPM was found to be useful in an unexpected area: "*In the XBRL Abstract Model Task Force, we aim to define a technology-neutral abstraction of the XBRL standard logic. In order to achieve that, the Primary Model uses concepts from the DPM methodology,*" says Herm Fischer, Member of the XBRL Standards Board.

Also the traditional financial reporting domain may, in future, become a user of DPM: "*We are monitoring the DPM developments and application, and analysing whether the methodology could be useful for IFRS XBRL financial reporting. Certain DPM findings may potentially improve our way of designing the IFRS taxonomy,*" says Olivier Servais, Director of XBRL Activities at the International Accounting Standards Board (IASB).

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WHAT LIES AHEAD FOR THE DPM?

The DPM methodology is not the solution for every supervisory data modelling problem. DPM-based XBRL taxonomies often require voluminous XBRL reports due to the way dimensions are defined in the XBRL contexts. Similarly, solutions are required to support the new approach and table (rendering) specification is required to visualise multi-dimensional data sets.

However, with the worldwide DPM adoption we can be certain to hear more about it in the coming months.

For more information about the DPM, visit: **www.eurofiling.info/dpm**. IBR