Version 1.2 – 10th Mar 2009

ISO 20022 and Metamodelling Frameworks

It is over a decade since XML was perceived as the savour of every organization's ills. It is true to say that, if appropriately implemented, it can provide the basis for the simplification of process and make the task of systems integration a lot easier. Nevertheless there has been a realization that a physical message model is merely one of many artefacts that an organization can deploy to manage its data.

The next stage in the evolutionary process is to encapsulate XML within a Metamodelling framework. This first came under the spotlight with the need to replace the antiquated tag based ISO 15022 message formats and in 2004, ISO 20022 (the "universal financial messaging scheme") was born.

Though, perceived by most as purely an XML message repository, ISO 20022 offers a great deal more. It is a Metamodelling framework that comprises of a number of artefacts that includes UML (Unified Modelling Language) components to define the business process, the message flows and message models themselves (see Figure 1). The XML message schemas are in fact generated from their UML equivalent by applying transformation rules defined within the standard.
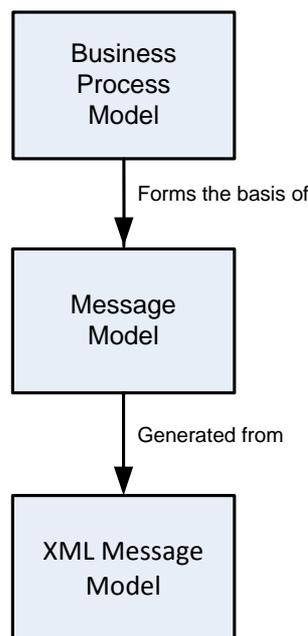

Figure 1 - ISO 20022 Version 1 - Metamodelling framework

As the scope and coverage of the ISO 20022 repository continues to grow, its real potential is beginning to be seen. From its core area of expertise, namely the settlement and payments domains, it has matured to include other areas within the financial arena; with the recent submissions that include ATM and card payments it is achieving exposure in retail payments and banking too.

ISO 20022 and Metamodelling Frameworks
 by Martin C Sexton

The scope and coverage of ISO 20022 continues to be extended. In late 2008, we saw the incorporation of the Financial Instrument Business Information Model (FIBIM), formerly ISO 19312, that enhanced the repository coverage to include instrument setup, pricing and corporate actions.

The inclusion of the FIBIM has provided the foundation for a couple of significant submissions, namely the replacement the ISO 15022 corporate action notification messages and Target 2 (the "Trans-european Automated Real-time Gross settlement Express Transfer system"), the European Central Bank's initiative to support cross border settlement within the European Union.

Another important event has been the release of the collaboration statement by the FIX Protocol, ISDA and SWIFT (who also have the role of Registration Authority for ISO 20022). In the past, both FIX Protocol and FpML (Financial products Markup Language) have stayed shy of the standard. As dominant players in the trading lifecycle and OTC Agreements domains respectively, it was obvious to them that creating an alternative set of message formats would provide no benefits to their user base. In the summer of 2008, with the commitment to support multiple message syntaxes by the RMG ("Registration Management Group", which is the governing board of ISO 20022), this left the door open to move forward.

FIX Protocol and FpML bring a wealth of knowledge to the table, which will benefit the standard. In addition, the Enterprise Data Management (EDM) Council's Semantic Repository initiative, which aims to standardize the use of terms and definitions of all reference data attributes, will also add value, if approved for inclusion into the ISO 20022 repository.

Nevertheless the standard has not been allowed stagnate. Recognizing the continued development of methodologies and technologies within the modeling arena, in December 2005, we saw the creation of an ISO working group (ISO TC68/WG4) to examine how best to move the standard forward technically. The working group has been defining the new version of the standard (internally known as 1.5); this version concentrates on removing the ambiguities, making it more understandable and more transparent to users. It also aims to takes advantage of the capabilities of UML version 2, overcoming the relatively weak semantic capabilities in UML 1, as deployed in ISO 20022 version 1. At present, the new version is in draft form and the aim is for it to be approved as an official release by the end of 2009. In addition the working group is examining how to support multiples syntaxes such as ASN.1, and other issues including supporting the needs of FIX and FpML.

Financial institutions see Metamodelling frameworks, such as ISO 20022, as useful tools to support their data management process; however in most instances they take the modeling one step further and manage database models, code binding, dictionaries, documentation and enumerated code lists, in addition to the XML message definitions. Figure 2 shows a typical set of artifacts that are incorporated into a Metamodelling framework.
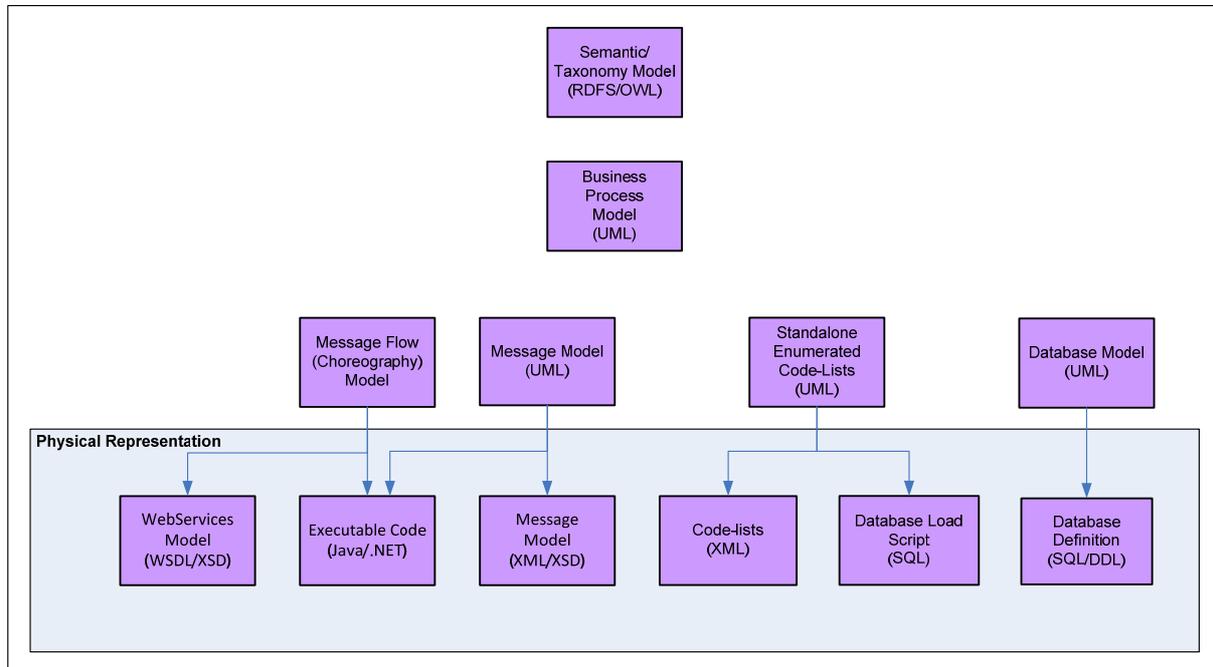
Figure 2 – A Typical Metamodelling Framework

Semantic/Taxonomy models contain the definition of fields independent of usage. These can be represented in Resource Description Framework Schema (RDFS), a W3C XML based recommendation or Web Ontology Language (also known as OWL). The EDM Council is currently constructing a Semantic Repository for use by the industry, which could be used to form the basis of such a model. Business Process, Message, Enumerated Code-Lists and Database models are normally represented using UML class diagrams. Message Flow choreography models can be supported in UML by using of sequence diagrams or the XML equivalent, the W3C Choreography Description Language (WS-CDL). The physical representation of these UML models are normally generated using predefined transformation rules, which results in the creation of XML schemas, executable code, enumerated code-lists and database definitions and load scripts.

As meta-modeling methodologies provide the ability take one step back from the physical representation, this level of abstraction means that, if alternative formats are required one does not end up by throwing the baby out with the dishwater. For example, why should an organisation be limited to XML formatted messaging? Who's to say XML will not be superseded by something new in the near future?

The future looks promising for ISO 20022 and organizations that use Metamodelling frameworks as the basis for managing their inter-company and enterprise-wide data management processes. These frameworks provide a structured flexible environment within which an organization can effectively manage systems integration and the data used by applications.