8.0 Introduction to Business Process Modelling

The development of an automated system or a project to re-engineer business processes generally follows a vision to improve existing systems.

In order to successfully implement an IT project, its development must reflect real-world processes. Developing or re-engineering projects can be successful if the initial vision is understood throughout the actual development process. Modelling can help bridge this gap, as it can capture the vision and communicate clearly and concisely to project members the ultimate goal of the project. The challenge in modelling is to accurately capture processes while avoiding wasting resources on unnecessary documentation (diagrams, explanatory notes, etc.). Flow diagrams are traditionally used to demonstrate the sequence of activities in a model, though rarely identify actors and roles. In order to successfully capture business processes and information requirements, it is necessary to establish a model that reflects clear and concise views and fulfils the requirements of a process description.

Business Process and Information modelling can assist in the identification of business processes that can be optimized. Modelling can also reveal redundant or missing data requirements and to prompt questions that need to be considered. Models and modelling:

- Can also reveal interesting things such as conflicting requirements, confusion over scope, terminology and disagreements between stakeholders/relevant parties.
- Can provide information about the progress of a development or re-engineering project.
- Are helpful to understand business consequences by testing the models in the physical world to see if they have the expected properties.
- Can be used to update manuals, Guides on information architecture, Guides on process architecture and even the Kyoto Convention Guidelines, provided that the models reflect the "real world" as distinct from the theory in manuals.
- Can support staff and management by visualising CBRA Processes / procedures.

8.2 Modelling Methodologies

A Methodology sets out a process that should be followed to ensure consistent production and delivery of results. For the WCO Data Model it is the delivery of e-business standards based on formal modelling and the specification of activities to be performed, roles of participants and deliverables to be produced.

UN/CEFACT modelling methodology (UMM) enables a common approach to the specification of business requirements and data to be shared internally and externally in a consistent manner.
UMM makes it possible for UN/CEFACT Forum Groups to adopt a common approach.

UMM uses UML as the modelling technique and can be supported by computer based software tools.

Although a full process would include software development and implementation stages, UMM is concerned only with those activities undertaken within UN/CEFACT.

Standardization enables the transfer of models from either one software tool to another for refinement, or to a repository, allowing it to be accessed by other modellers.

UML models can be transferred from one modelling software tool to another, in most cases, using XML Metadata Interchange (XMI).

The WCO's IMSC agreed to use the UML and UMM as the modelling standards.

UML helps to specify, visualise and document:
- business process models and information requirements;
- non-software systems (e.g. procedures of a process or UN/EDIFACT DMRs); and
- software systems modelling.

A characteristic of UML enabling its widespread support is that it is methodology independent, meaning that the methodology used to perform the analysis and design, UML can be used to express the results.

UML defines twelve types of diagrams, divided into three categories;
1. Model Management Diagrams
   a. Packages diagrams
   b. Subsystems diagrams
2. Behaviour Diagrams
   a. Use Case Diagrams
   b. Sequence Diagrams
   c. Activity Diagrams
   d. Collaboration Diagrams
   e. State Chart Diagrams
3. Structural Diagrams
   a. Class Diagrams
   b. Object Diagrams
   c. Component Diagrams
   d. Deployment Diagrams

Use Case diagrams, Activity diagrams, and Class diagrams have been used for the WCO Data Model modelling work.

There will always be:
- Situations in the model that are not in the business process
- Situations in the business process that are not in the model
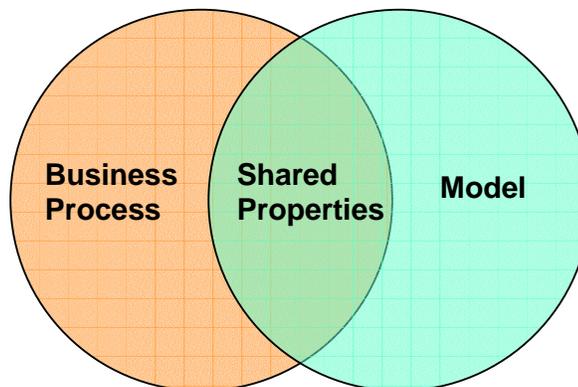
8.3 WCO Data Model modelling

In the "Introduction to Business Process and Information modelling" chapter, Use Case diagrams, activity diagrams, and class diagrams were outlined. In order to model the cross-border business processes, the Simple Business Process Model has been added.

The four models/diagrams can be divided into two groups. The first includes the Simple Business Process Model, Use Case Diagrams and their descriptions, and Activity Diagrams; the second group includes Class diagrams.

The above-mentioned Business Process Models are high level models based on the Revised Kyoto Convention as well as other detailed process steps. Customs administrations that choose to model their national CBRA Business Processes are strongly advised to use the WCO Business Process and Information Models as the basis for further modelling on national and regional levels.

The Class Diagrams are based on the three mentioned above models, the Data Sets and the approved Data Maintenance Requests. A model with Class Diagrams contains a classification (grouping) of data elements in subsets where each subset has a clear definition that represents a "real-world" concept (class). It also shows relationships between concepts (classes). Because different models are needed for different purposes the modelling can be best described as conceptual modelling with the aim of identifying the key concepts involved in the WCO Data Model Data Sets. These concepts have been used to model the messages.

The documentation part of the UMM Class Diagram chapter indicates what data requirement is used in a particular class referring to the WCO Reference which can be found in the overall/specific Data Sets

Additional information on the models
Simple Business Process Model;
The term "reports / declares / produces" refers to the Revised Kyoto Convention meaning of the term: to *report* the Cargo Declaration, to *declare* a Goods Declaration and to *produce* the Goods or a declaration of departure or arrival to Customs.

Use Case diagram;
The stick figures represent actors that can have a role. The ovals represent actions/steps in the process and the lines indicate a relation between the actor and the process step

Use Case description;
In the row Actors synonyms are to be found but also those parties that can play the role of that actor. In the row scenario the process is described step by step (at a fairly high level).

Activity diagram
The labels on top of the diagram indicate the relevant actors. The diagram has to be read from the top left to the bottom right. This diagram shows the activities in a Customs Process in a logical order therefore, also in a certain sequence.

Overall Multi Link diagram
The Overall Multi Link diagram includes all CBRA processes and procedures as mentioned in the WCO Data Model Data Set spreadsheet.
The main purpose of this diagram is to simplify maintenance of the class diagrams. If something is changed in the Overall Multi Link diagram, it will automatically be changed in the derived detailed diagrams.