ECONOMIC COMMISSION FOR EUROPE

COMMITTEE FOR TRADE, INDUSTRY AND ENTERPRISE DEVELOPMENT
Centre for Trade Facilitation and Electronic Business (UN/CEFACT)
Seventh session, 26-29 March 2001
Item 9 of the provisional agenda

N90- NEXT Generation E-Commerce
“Collaboration…the key to Global Business Success”

UN/CEFACT MODELLING METHODOLOGY
FOR ENABLING ECOMMERCE BUSINESS COLLABORATION:
AN OVERVIEW

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Submitted by the Techniques and Methodology Working Group (TMWG)*

This document has been submitted for information and approval.

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Executive Summary

1. We are living in an era of rapidly changing business environments. This is due to changes in technologies, governmental regulations and liberalization, competitive alliances and customer demographics. The ability of a business to rapidly offer new services and products based on emerging technologies, assure the efficient and effective delivery and maintenance of services/products and the accurate and timely billing is critical to its success.

2. Essentially the drive for Business Process integration is arising from a need to conduct business in particular ways in order to improve commerce automation. Over half of all business opportunities are lost due to delays in the service/product ordering and delivering process chains. Inconsistency in information and data definitions, no sources or multiple sources of information, and erroneous steps in processing, all contribute to business’s inability to effectively and efficiently vend products and services. This is causing a more rigorous introspection of the business processes and the information exchanged amongst these processes in order to more clearly define how and why business is conducted.

3. Business Process and Information Modelling, using the Unified Modelling Language (UML) is the means adopted by UN/CEFACT to tackle business process integration in a structured way. In order to use UML consistently within UN/CEFACT, the Techniques and Methodologies Working Group (TMWG) has developed the UN/CEFACT Modelling Methodology (N090) for usage within the UN/CEFACT family of working groups. This document describes N090 and requests UN/CEFACT to approve N090 in principle. As N090 is over 150 pages long, a full HTML version of N090 will be provided on compact disc to all delegations in the second quarter of 2001.

Introduction

4. This document provides an overview of UN/CEFACT/TMWG/N090, the UN/CEFACT Modelling Methodology. The full N090 document is approximately 150 pages in length and is best presented in an interactive HTML format to experts who will be utilizing the Unified Modelling Language to describe business processes. A compact disc containing the HTML version of N090 will be circulated in April 2001 to all working groups for reference and usage. Put simply, the N090 UN/CEFACT Modelling Methodology describes how modellers will apply the Unified Modelling Language in a consistent manner within UN/CEFACT and its family of working groups. Training and education support will be provided to those using the Modelling Methodology to ensure the best application to meet trade facilitation and electronic business objectives.

5. This document provides:

- The rationale for Business Process and Information Modelling
- The industry support for Business Process and Information Modelling
- A brief description of the elements of the UN/CEFACT Modelling Methodology (N090)
- An introduction to the eBusiness Metamodel (the framework that organizes the components of N090)
- A recommendation to adopt N090 in principle.

Rationale for Business Process and Information Modelling

6. Until recently, electronic commerce was only viewed in the context of electronic bonding or electronic data exchange (EDI). This way of integrating business process was very system/data centric. Integration occurred between systems and the focus was on the messages exchanged between these systems.
Figure 1 below illustrates the perspective in which electronic commerce has been defined.

![Figure 1 - Message Oriented eCommerce]

In a collaborative environment, electronic commerce is viewed in the context of the commercial transaction that occurs amongst business partners, shown in figure 2.

![Figure 2 - eCommerce Collaboration]

Many of the current technologies combined with well-defined problem solving methodologies are enabling the integration of systems from more than one perspective and at different system levels: The message transport level, system and application level and at the business process levels. By providing the different views within a problem domain, it is possible to describe the same problem/solution from different perspectives and ensure that each perspective can be brought into other the subsequent perspectives. This assures the ability to predict the result of specification development.

**Industry support for Business Process and Information Modelling**

7. The UN/CEFACT TMWG has created a framework for specifying business interfaces and business models utilizing the current state of the industry. By embracing and adapting methodologies and frameworks from various leading organizations, the N090 UMM has been built from these resources and represents the best of practice for the specification of protocol and technology unbiased standards. These organizations include the International Telecommunication Union (ITU), TeleManagement Forum (TMForum), UN/ECE, RosettaNet and others.
8. Some industries are early adopters of the N090, including the Global Commerce Initiative (GCI), X12, ebXML, and the BPAWG, EWG, and TMWG of UN/CEFACT. Portions of N090 are in commercial use by other organizations, e.g. S.W.I.F.T. The Object Management Group (OMG) stated interest in adopting N090 once the N090 specification is public. With such prevalent cross-industry use of UML, the Unified Modelling Method (UMM) will allow the use of commercially available support tools. In fact, interface standardization work not based on UML might risk lack of software developer support.

9. The N090 approach of separating business process analysis from message design is in keeping with the fundamental objective of the Open-edi Reference Model, ISO/IEC 14662, contributed to and supported by WP4 of the UN/ECE. Business process and information Modelling is also seen as the means to “future-proof” the interface standardization work. Standard interfaces among information systems are “technology neutral,” capable of accommodating technology advances in data protocols without reworking the interface standards. In this regard, strong interest was shown among interface standards development organizations in the recent Business Object Summit, sponsored by the MoU on eBusiness.

UN/CEFACT Modelling Methodology

10. Prescription and precision are the key aspects of the methodology that assures the outcome of specification development. Precision is achieved by the explicit definition of a constrained set of Modelling and a set of business transaction patterns. Prescription is achieved by the adaptation and definition of the unified Modelling methodology.

- Business Process and Information Metamodel precisely defines the Modelling vocabulary
- Business Transaction Patterns precisely define the structure of business process interactions
- Unified Modelling Method prescriptively defines the construction of specification artifacts.

a) Main Technical Features

Achieving the goals of delivering state-of-the-art in content and computational specification requires:

- Describing and implementing the artifacts of development in a manner that enables them to be reused.
- Using current state of industry knowledge by extracting generic and universal artifacts from industry standards.
- Capturing the syntax, semantics and grammar of the reusable artifacts in an object oriented form.
- Enabling the extension and adaptation of the reusable artifacts without invalidating the original version.
- Enabling the assembly of executable systems using both static (build time) and dynamic (deployment time) techniques.

b) Provides Solution in Context of Business Requirements

Modelling is a methodology or technique that defines the way a particular domain or aspect of the problem solving lifecycle is specified. Business Process and Information Modelling (BPIM) focuses on the activities and workflows that comprise a business domain. BPIM defines the system using perspectives, terms and semantics that are familiar to a businessperson.

The purpose of BPIM is not to design software systems but rather to design and understand business systems holistically. It can be used by a variety of analysts and corporate staff to communicate knowledge about the system.

c) Objectives of the Methodology

This methodology has been produced as a framework for classifying and categorizing business requirements, determinating general business processes and applying of the respective business transactions. The methodology also identifies and describes the business systems that support these processes. In order to ensure that the integrity and validity of the model presented in this methodology is maintained, many references and resources are used.
UN/CEFACT Modelling Methodology MetaModel

11. The N090 UMM is based on a precise definition of an UML metamodel extension that facilitates the expression of business processes as an object-oriented model. This extended metamodel is termed the e-Business Process and Information Metamodel, illustrated in figure 3.

![Figure 3 e-Business Process and Information Metamodel](image)

The metamodel is organized into the following views so that each process model can be viewed from a number of perspectives:

- **The Business Operations Map (BOM) metamodel** – the partitioning of business processes into business areas and business categories.
- **The Business Requirements View (BRV) metamodel** – the view of a Business Process and Information model that captures the Use Case scenarios, inputs, outputs, constraints and system boundaries for business transactions and their interrelationships.
- **The Business Transaction View (BTV) metamodel** - the view of a Business Process and Information model that captures the semantics of business information entities and their flow of exchange between roles as they perform business activities.
- **The Business Service View (BSV) metamodel** - the view of a Business Process and Information model that specifies the network component services and agents and their message (information) exchange as interactions necessary to execute and validate a business process.

These perspectives support an incremental model construction methodology and provide levels of specification granularity that are suitable for communicating the model to business practitioners, business application integrators and network application solution providers. An overview of the UMM Modelling process and illustration of each view of the metamodel are provided in the annex.

**Recommendation**

The CSG requests the UN/CEFACT Plenary to adopt the full N090 in principle for use across the UN/CEFACT family of Working Groups. Available via web, a compact disc will also be issued in the second quarter of 2001 with the full contents of N090 in HTML. As N090 will require updating on a regular basis to keep the document abreast of marketplace influences, it is suggested that each Working Group register an expert who will be the main point of contact for receiving N090 updates. A training schedule will be identified to teach those who will be using N090 on a regular basis to capture the business requirements of UN/CEFACT Working Groups.
Annex
Modelling Process Overview

The Modelling process being used to capture the requirements is a method for a general systems approach that can model aspects of a business system and can be used by a variety of analysts and corporate staff to communicate knowledge about the system. The result is a Business Process and Information Model that delineates and organizes the major goals of a business. For each process in this Model activities are defined that represent general categories of tasks needed to be performed to meet some aspect of that business process. The systems that support these activities can then be mapped into these activities. Object-Oriented Requirement and Use Case Analysis is then used to determine the activity or collaboration that occurs among the various roles involved in the activity. These collaborations represent potential points of integration between various business units.

d) Modelling Approach

The following diagrams depict the methodology and approach for capturing system capabilities and requirements within a standards-based process and architectural model.
The Business Requirement View is a specification view of Business Processes defined as use cases, requirements and collaborations.

The Business Transaction View is a specification of a business transaction according to six predefined, legally binding patterns.

The Business Service View is an explicit specification of business process interactions according to the type of transaction, type of role, security and timing parameters. A set of interactions can be derived from the BTV according to the system requirements.

The Implementation View is a specification of a business interaction according to these selected technology and protocol. (Not part of UMM).