



**UN/CEFACT**

United Nations Centre for Trade Facilitation and Electronic Business

Techniques and Methodologies  
Group (TMG)

## **UN/CEFACT's Modeling Methodology (UMM):**

**UMM Meta Model – Base Module Version 1.0  
Technical Specification  
2006-10-06**

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# 61 About this Document

## 62 1.1 Status of this Document

63 This document has completed the Open Development Process (ODP) of UN/CEFACT on 2006-10-06. It  
64 is a UN/CEFACT Technical Specification.

## 65 1.2 Revision History

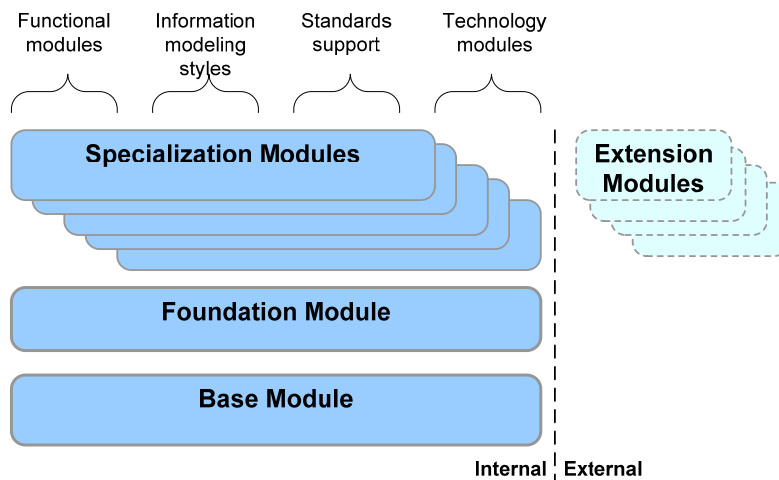
Version	Release	Date	Comment
Candidate for 1.0	First Working Draft	2005-08-11	
Candidate for 1.0	Second Working Draft	2006-03-17	
Candidate for 1.0	Final Working Draft	2006-06-22	
Version 1.0	Technical Specification	2006-10-06	

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## 67 1.3 Document Context

68 The UMM meta model is divided in a set of meta modules. This means the UMM meta model is  
69 partitioned into functional levels, ranging from core, minimal functionality to complete functionality. The  
70 following partitions levels have been defined for meta modules:

- 71 • **Base:** Covers the fundamental principles that are shared across all the other modules.
- 72 • **Foundation:** Includes the core concepts of the UMM. Defines all the concepts that are used as  
73 part of the minimal methodology to produce a UMM compliant business collaboration module
- 74 • **Specialization:** Multiple specialization modules might define add-on concepts to the  
75 foundation. Each specialization module addresses a specialized type of analysis that extends the  
76 foundation module at a well-defined extension point for a certain topic. Specialization modules  
77 might become candidates for later inclusion into the foundation module.
- 78 • **Extension:** Extension modules serve the same purpose as specialization modules. Whereas  
79 specialization modules are developed and maintained by UN/CEFACT, extension modules are  
80 adding features that are created and maintained by external organization.



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82

**Figure 1 Module structure of the UMM meta model**

83 This specification defines the base module of UMM.

## 84 **2 Project Team**

### 85 **2.1 Disclaimer**

86 The views and specification expressed in this document are those of the authors and are not necessarily  
87 those of their employers. The authors and their employers specifically disclaim responsibility for any  
88 problems arising from correct or incorrect implementation or use of this technical specification.  
89

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## 3 Introduction

### 3.1 Audience

A reader of the document **MUST** have a deep understanding of UML 1.4. He or she **MUST** be able to understand meta models denoted as UML class diagrams. He or she **SHOULD** be familiar with the UML 1.4. meta model, at least he or she **MUST** be able to check back with the UML 1.4. meta model. The reader **SHOULD** be familiar with OCL 2.0 in order to understand the OCL constraints of this UMM profile – those who are not familiar with OCL are provided with a plain text description of the constraint.

The information described in this manual is aimed at

- advanced business process modelers who check a UML model for UMM compliance (if not supported by a tool)
- advanced business process modelers who train other business process modelers and business process analysts
- software designers who want to produce UML tools providing support for this UMM foundation module
- software designers who want to produce tools to transform UMM compliant business collaboration models into specifications of the IT-layer (ebXML, Web Services, UN/EDIFACT, etc.).
- software designers who want to produce repositories to register UMM compliant business collaboration models

### 3.2 Related Documents

- **UN/CEFACT**
  - UN/CEFACT Open Development Process  
[http://www.unece.org/cefact/cf\\_plenary/plenary05/cf\\_05\\_05e.pdf](http://www.unece.org/cefact/cf_plenary/plenary05/cf_05_05e.pdf)
  - BCSS: A UML Profile for Core Components  
BCSS LINK
  - Core Component Technical Specification  
[http://www.unece.org/cefact/ebxml/CCTS\\_V2-01\\_Final.pdf](http://www.unece.org/cefact/ebxml/CCTS_V2-01_Final.pdf)
- **International Organization for Standardization (ISO)**
  - Open-edi Reference Model. ISO/IEC 14662  
[http://standards.iso.org/ittf/PubliclyAvailableStandards/c037354\\_ISO\\_IEC\\_14662\\_2004\(E\).zip](http://standards.iso.org/ittf/PubliclyAvailableStandards/c037354_ISO_IEC_14662_2004(E).zip)
- **Object Management Group (OMG)**
  - Unified Modeling Language Specification (UML), Version 1.4.2  
<http://www.omg.org/docs/formal/05-04-01.pdf>

### 3.3 UN/CEFACT's Modeling Methodology (UMM): Overview

UN/CEFACT's Modeling Methodology (UMM) is a UML modeling approach to design the business services that each partner must provide in order to collaborate. It provides the business justification for the services to be implemented in a service-oriented collaboration architecture. Thus, a primary vision of UN/CEFACT is to capture the business knowledge that enables the development of low cost software based on service-oriented architectures (SOA) helping the small and medium size companies (SMEs), and emerging economies to engage in e-Business practices. UMM focuses on developing a global choreography of inter-organizational business processes and their information exchanges. UMM models are notated in UML syntax and are platform independent models. The platform independent UMM models identify which services have to be realized in a service-oriented architecture implementing the business collaboration. This approach provides insurance against technical obsolescence.

The UMM, as described in this document is the formal description technique for describing any Open-edi scenario as defined in ISO/IEC 14662 Open-edi reference model. An Open-edi scenario is a formal means to specify a class of business transactions having the same business goal, such as, purchasing or inventory management. The primary scope of UMM is the Business Operations View (BOV) and not the Functional Service View (FSV) as defined in ISO/IEC IS 14662. The BOV is defined as "a perspective of business transactions limited to those aspects regarding the making of business decisions and commitments among organizations", while the FSV is focused on implementation specific, technological aspects of Open-edi. The commitments of the BOV layer are reflected in the choreography of the inter-organizational business process and its information exchanges. At the FSV layer this choreography must be implemented by a set of composite services. It follows, that UMM on the BOV layer defines what the business is about and technologies on the FSV layer define how to implement the business by a service-oriented architecture.

This version of the UMM consists of three views each covering a set of well defined artifacts:

- Business Domain View (BDV)
- Business Requirements View (BRV)
- Business Transaction View (BTV)

**Business Domain View (BDV):** The BDV is used to gather existing knowledge. It identifies the business processes in the domain and the business problems that are important to stakeholders. It is important at this stage that business processes are not constructed, but discovered. Stakeholders might describe intra-organizational as well as inter-organizational business processes. All of this takes place in the language of the business experts and stakeholders. The business domain view results in a categorization of the business domain (manifested as a hierarchical structure of packages) and a set of relevant business processes (manifested as use cases). The result may be depicted in use case diagrams.

**Business Requirements View (BRV):** The goal of the BRV is identifying collaborative business processes between different business partner types and describing the requirements regarding these collaborative business processes. In order to identify collaborative business processes the static descriptions of the internal business processes discovered in the BDV are described in more detail and are analyzed regarding their dynamic behavior and their relationship to each other. Based on this analysis the relevant "real-world"-concepts in the domain of the collaboration are identified. This is done by focusing on business entities, which are "real-word" things having business significance and a shared among the business partners involved in the collaboration. The requirements of aligning the states of these business entities between the business partners are documented by business collaboration use cases and by business transaction use cases.

**Business Transaction View (BTV):** The BTV represents the view of the business process analyst who transforms the requirements into a choreography of information exchanges. Currently, the overall

197 choreography of a business collaboration is defined by an activity graph called business collaboration  
198 protocol. In a future version other alternatives may be developed. The business collaboration protocol  
199 choreographs the flow among business interactions. This flow depends on the states of business entities.  
200 Currently, a business interaction is always defined by a business transaction. Other alternatives may be  
201 developed in future versions. A business transaction defines a simple choreography of exchanging  
202 business information between two authorized roles and an optional response. A business transaction  
203 identifies the business actions of each partner responsible for sending and receiving the business  
204 information. These actions correspond to the services that must be implemented on each business  
205 partner's side in a service-oriented collaboration architecture. The business information exchanged  
206 corresponds to the input/output of these services. The choreography among the business transactions –  
207 described by the business collaboration protocol in UMM – is easily mapped to machine-readable  
208 choreography languages (such as BPEL, WS-CDL, BPSS).

209 An execution of a business transaction usually results in the change of state of one or more business  
210 entities. Thus, the information exchanged in a transaction should be limited to the minimum information  
211 needed to change the state of a business entity. Nevertheless, UMM allows the definition of an  
212 information exchange in a document-centric approach – even if this is not recommended. A business  
213 transaction leads to synchronized states of the business objects at both partners participating in a business  
214 transaction. Inasmuch, a business transaction is a unit of work that allows roll-back. A business  
215 transaction has a number of quality of service (QoS) parameters that represent security and timing  
216 requirements. These are specified in tagged values.

## 217 **3.4 Objectives**

### 218 **3.4.1 Goals of the Technical Specification**

219 The goals of this specification are:

- 220 • To define a set of data types that may be shared between the UMM Foundation module and  
221 different UMM Specialization modules
- 222 • To define the fundament on which constitutive UMM specifications may be based upon.

### 223 **3.4.2 Requirements**

224 This specification is guided by the following key requirements derived from the above goals:

- 225 • The UMM Base module contains only stereotypes that are currently used in the UMM Foundation  
226 module or in a UMM Specialization module
- 227 • Today, the UML is the most commonly supported modeling language by modeling tools. In order  
228 to use the broad range of tools, a UMM model must be a special kind of UML model. Thus, the  
229 UMM base module is based on the UML meta model. In fact, it provides a UML Profile  
230 consisting of stereotypes, tag definitions and constraints.

### 231 **3.4.3 Caveats and Assumptions**

232 This specification makes the following assumptions:

- 233 • This UML profile is based on the UML meta-model version 1.4.2. This version is the current ISO  
234 version. Using another UML meta-model as a basis for the development of a UMM compliant  
235 business collaboration model will not deliver correct results.

## 236 **3.5 Structure of the UMM Base Module**

237 The UMM base module provides common data types, which may be used by the UMM foundation  
238 module or by other specialization and extension modules. This version of the base module consists of just  
239 one package named “Management”. This package defines two stereotypes – *RegistryObject* and  
240 *BusinessLibraryPackage*. Elements, which are stereotyped as *RegistryObject* (or as one of its subtypes),

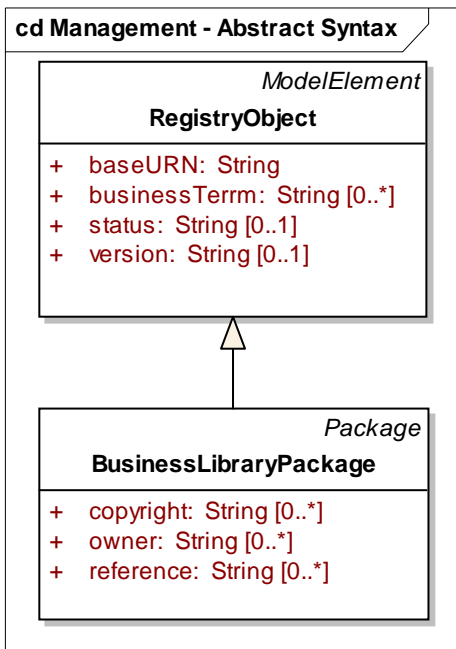
241 are candidates for registration in a registry. A *BusinessLibraryPackage* is a *RegistryObject*, which acts as  
242 container for elements, which should be registered and retrieved together to be semantically complete.



243 **4 UMM Base Module**

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245 **4.1 Stereotypes and Tag Definitions (normative)**



246 **Figure 2 UMM Base Abstract Syntax**

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Stereotype	RegistryObject	
Base Class	ModelElement	
Parent	N/A	
Description	A registry object (or a specialization of it) is a model element, which is a candidate for registration in a registry.	
Tag Definition	<b>baseURN</b>	
	Type	String
	Multiplicity	1
	Description	The namespace of a registry object. Concatenated with the name of the instance (local name) and the version of this instance, it <b>MUST</b> be a valid Uniform Resource Name (URN). Example: urn:untmg.org:MyBusinessCollaboration:1.0 whereby the baseURN is untmg.org
	<b>version</b>	
	Type	String
	Multiplicity	0..1
	Description	Holds the current version of a registered object. Each registered object <b>SHOULD</b> have version information and it <b>SHOULD</b> be set and maintained by the responsible registry.

	<b>status</b>	
	<b>Type</b>	String
	<b>Multiplicity</b>	0..1
	<b>Description</b>	An indicator for the current lifecycle status of a registered object. The status <b>MUST</b> be set by the registry.
	<b>businessTerm</b>	
	<b>Type</b>	String
	<b>Multiplicity</b>	0..*
	<b>Description</b>	A business term is a synonym, by which a business entity is commonly known.

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<b>Stereotype</b>	<b>BusinessLibraryPackage</b>	
<b>Base Class</b>	Package	
<b>Parent</b>	RegistryObject	
<b>Description</b>	A business library package is a container for objects, which together build a semantic unit. All objects of this unit <b>SHOULD</b> be registered and retrieved together.	
<b>Tag Definition</b>	<b>owner</b>	
	<b>Type</b>	String
	<b>Multiplicity</b>	0..*
	<b>Description</b>	The owner of the business library package, who might be an organization, an institution or an individual.
	<b>copyright</b>	
	<b>Type</b>	String
	<b>Multiplicity</b>	0..*
	<b>Description</b>	Holds information about the copyright of a business library package.
	<b>reference</b>	
	<b>Type</b>	String
	<b>Multiplicity</b>	0..*
	<b>Description</b>	Identifies references to additional resources, where continuative information about the business library package could be found.

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## 252 **Copyright Statement**

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