



**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***

***Candidate for 2.0***

***Draft for IMPLEMENTATION VERIFICATION***

***2009-01-30***

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28 **1 About this Document**

29 **1.1 Status of this Document**

30 This document is currently being developed, and is at Open Development Process Step 6:  
31 “Implementation Verification”

32 (i) Activities

33 The UNECE secretariat provides links on the UNECE website to the implementation. The  
34 FMG notifies Heads of Delegation and various e-mail distribution list subscribers that the  
35 Implementation Draft is available for implementation verification and provides them  
36 with details regarding the process for submitting comments. The project team processes  
37 comments and posts updated Implementation Drafts and comment logs to the PG  
38 website or UNECE website (through the secretariat). The comment/update/posting cycle  
39 continues until at least two independent implementations have been confirmed and the  
40 PG approves a project team recommendation to conclude ODP6. While the criteria,  
41 evaluation, and ultimate decision to conclude ODP6 is left to the PG, the PG must ensure  
42 that the project team has met all comment processing requirements

43 (ii) Artifacts

- 44 Typical artifacts produced by ODP6 include:
- 45 a. Final Draft
  - 46 b. Updated Comment Log

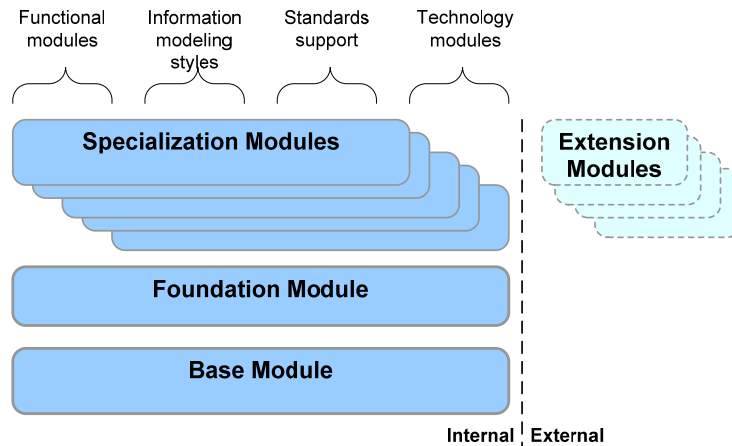
47 The first review cycle of ODP 6 is open until 17<sup>h</sup> April 2009. Please send your comments to the Project  
48 Lead Christian Huemer ([huemer@big.tuwien.ac.at](mailto:huemer@big.tuwien.ac.at))

49 **1.2 Revision History**

Version	Release	Date	Comment
Candidate for 2.0	Internal Draft	2008-04-11	
Candidate for 2.0	Public Draft	2008-06-27	
Candidate for 2.0	Implementation verification	2009-01-30	Changes from both previous drafts are marked in green

50 **1.3 Document Context**

51 The UMM meta model is divided into a set of meta modules. This means the UMM meta model is  
52 partitioned into functional levels, ranging from core, minimal functionality to complete functionality. The  
53 following partition levels have been defined for meta modules:



54  
55 **Figure 1 Module structure of the UMM meta model**

56 **Base:** Covers the fundamental principles that are shared across all of the other modules.

57 **Foundation:** Includes the core concepts of the UMM. In addition, it defines all of the concepts that are used  
58 as part of the minimal methodology to produce a UMM compliant business collaboration model.  
59 Furthermore, it provides fundamental principles which are shared across all of other modules.

60 **Specialization:** Multiple specialization modules might define add-on concepts to the foundation module.  
61 Each specialization module addresses a specialized type of analysis that extends the foundation module at a  
62 well-defined extension point for a specific topic. Specialization modules might become candidates for later  
63 inclusion into the foundation module.

64 **Extension:** Extension modules serve the same purpose as specialization modules. Whereas specialization  
65 modules are developed and maintained by UN/CEFACT, extension modules are adding features that are  
66 created and maintained by organization(s) which are external to UN/CEFACT.

67 This specification defines the base module of UMM 2.0.

## 68 1.4 Conventions

69 The keywords MUST, MUST NOT, REQUIRED, SHALL, SHALL NOT, SHOULD, SHOULD NOT, RECOMMENDED,  
70 MAY and OPTIONAL, when they appear in this document, are to be interpreted as described in [RFC2119] as  
71 quoted here:

- 72 • MUST: This word, or the terms "REQUIRED" or "SHALL", means that the definition is an absolute  
73 requirement of the specification.
- 74 • MUST NOT: This phrase, or the phrase "SHALL NOT", means that the definition is an absolute  
75 prohibition of the specification.
- 76 • SHOULD: This word, or the adjective "RECOMMENDED", means that there may exist valid reasons in  
77 particular circumstances to ignore a particular item, but the full implications MUST be understood  
78 and carefully weighed before choosing a different course.
- 79 • SHOULD NOT: This phrase, or the phrase "NOT RECOMMENDED", means that there may exist valid  
80 reasons in particular circumstances when the particular behavior is acceptable or even useful, but  
81 the full implications should be understood and the case carefully weighed before implementing any  
82 behavior described with this label.

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- MAY: This word, or the adjective "OPTIONAL", means that an item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because the vendor feels that it enhances the product while another vendor may omit the same item. An implementation that does not include a particular option MUST be prepared to interoperate with another implementation which does include the option, though perhaps with reduced functionality. In the same vein an implementation that does include a particular option MUST be prepared to interoperate with another implementation which does not include the option (except, of course, for the feature the option provides).

92

## 93 2 Project Team

### 94 2.1 Disclaimer

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

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127 The Editing Team of this UMM base module likes to thank former members of TMG's Business Process  
128 Working Group (BPWG) who have spent enormous efforts in putting the UMM into a stage that we were  
129 able to build upon in order to create this base module.

130

## 131 3 Introduction

### 132 3.1 Audience

133 A reader of the document must have a deep understanding of UML 2.1.2. She or he must be able to  
134 understand meta models denoted as UML class diagrams. She or he should be familiar with the UML 2.1.2.  
135 meta model, at least she or he must be able to check back the UML 2.1.2. meta model. The reader should be  
136 familiar with OCL 2.0 in order to understand the OCL constraints of this UMM profile – those who are not  
137 familiar with OCL are provided with a plain text description of the constraint.

138 The information described in this manual is aimed at

- 139 • advanced business process modelers that verify a UML model for UMM compliance (if not supported  
140 by a tool)
- 141 • advanced business process modelers who train other business process modelers and business  
142 process analysts
- 143 • software designers who want to produce UML tools providing support for this UMM foundation  
144 module
- 145 • software designers who want to produce tools to transform UMM compliant business collaboration  
146 models into specifications of the IT-layer (ebXML, Web Services, UN/EDIFACT, etc.).
- 147 • software designers who want to produce repositories to register UMM compliant business  
148 collaboration models

### 149 3.2 Related Documents

- 150 • **UN/CEFACT**
  - 151 ○ UN/CEFACT Open Development Process (TRADE/R.650/Rev.4/Add.1/Rev.1 - 19 April 2007)  
152 [http://www.unece.org/cefact/cf\\_plenary/plenary07/trd\\_R650\\_Rev4\\_A1E.pdf](http://www.unece.org/cefact/cf_plenary/plenary07/trd_R650_Rev4_A1E.pdf)
  - 153 ○ UPCC 1.0 - UML Profile for Core Components  
154 <http://unstandards.org:8080/display/public/UPCC+-+UML+Profile+for+Core+Components>
  - 155 ○ Core Component Technical Specification  
156 [http://www.unece.org/cefact/ebxml/CCTS\\_V2-01\\_Final.pdf](http://www.unece.org/cefact/ebxml/CCTS_V2-01_Final.pdf)
  - 157 ○ Core Component Message Assembly  
158 <http://www.unstandards.org:8080/display/public/CCMA+-+ODP+3+-+1st+Working+Draft>
- 159 • **International Organization for Standardization (ISO)**
  - 160 ○ Open-edi Reference Model. ISO/IEC 14662  
161 [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)
- 162 • **Object Management Group (OMG)**
  - 163 ○ Unified Modeling Language Specification (UML), Version 2.1.2  
164 <http://www.omg.org/docs/formal/07-02-05.pdf>

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### 167 3.3 UN/CEFACT's Modeling Methodology (UMM): Overview

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

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

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

- 191 • Business Requirements View (bRequirementsV)
- 192 • Business Choreography View (bChoreographyV)
- 193 • Business Information View (bInformationV)

194

195 **Business Requirements View (bRequirementsV):** The Business Requirements View is used to gather existing  
196 knowledge. It identifies the business processes in the domain and the business problems that are important  
197 to stakeholders. It is important at this stage that business processes are not constructed, but discovered.  
198 Stakeholders might describe intra-organizational as well as inter-organizational business processes. All of this  
199 takes place in the language of the business experts and stakeholders. The business requirements view results  
200 in a categorization of the business domain (manifested as a hierarchical structure of packages) and a set of  
201 relevant business processes (manifested as use cases). The result may be depicted in use case diagrams. In  
202 order to model the dynamics of each business process, one may use a Business Process Activity Model, or a  
203 Sequence Diagram, which would be placed beneath the Business Process Use Case. As a practical note, the  
204 Business Process Activity Model may depict a process or processes which involve one or more Business  
205 Partners. A Sequence Diagram will depict information exchanges between two or more Business Partners.  
206 The Business Partners are described within their own package (Business Partner View). A Business Process  
207 Activity Model may show state changes to Business Entities. Business Entities are "real-world" things having  
208 business significance and are shared among the business partners involved in the collaboration. The Business

209 Entities and their lifecycles of state changes are modeled in the Business Entity View. Furthermore, the  
210 Business Entity View also contains one or more packages which represent the conceptual data structures of  
211 the Business Entities.

212 **Business Choreography View (bChoreographyV):** The Business Choreography View is used to define and  
213 document the global choreography between collaborating business partners in an inter-organizational  
214 business process. Within the Business Choreography View, the Business Transaction View contains and  
215 documents the requirements of Business Transaction Use Cases, and their participating Authorized Roles.  
216 The dynamics of a Business Transaction Use Case are described by a Business Transaction. A business  
217 transaction defines a simple choreography of exchanging business information between two authorized  
218 roles and an optional response. A business transaction identifies the business actions of each partner  
219 responsible for sending and receiving the business information. These actions correspond to the  
220 requirements of any solution that must be implemented on each business partner's side in a service-  
221 oriented collaboration architecture. Within the Business Choreography View, the Business Collaboration  
222 View contains and documents the requirements of Business Collaboration Use Cases and their participating  
223 Authorized Roles. The dynamics of a Business Collaboration Use Case are described by a Business  
224 Collaboration Protocol. A Business Collaboration Protocol choreographs the flow among business  
225 transactions, and/or nested Business Collaboration Protocols. This flow depends on the states of business  
226 entities. When a Business Collaboration Use Case is identified, but different sets of parties may execute this  
227 collaboration, the different Realizations (executions) may be modeled within the Business Realization View,  
228 as a Business Realization Use Cases.

229 **Business Information View (bInformationV):** An execution of a business transaction usually results in the  
230 change of state of one or more business entities. Thus, the information exchanged in a transaction should be  
231 limited to the minimum information needed to change the state of a business entity. Nevertheless, UMM  
232 allows the definition of an information exchange in a document-centric approach – even if this is not  
233 recommended. A Business Information View contains Business Information Artifacts. UMM does not  
234 mandate a specific Business Information Modeling approach. However, UMM strongly recommends that  
235 Business Information is modeled in accordance to UN/CEFACT's Core Components Technical Specification  
236 and Message Assembly Guidelines. In order to model Core Components by means of UML, UN/CEFACT  
237 provides the Profile for Core Components (UPCC).

## 238 3.4 Objectives

### 239 3.4.1 Goals of the Technical Specification

240 The goals of this specification are:

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

### 244 3.4.2 Requirements

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

- 246 • The UMM Base module contains only stereotypes that are currently used in the UMM Foundation  
247 module or in a UMM specialization and extension modules
- 248 • Today, the UML is the most commonly supported modeling language by modeling tools. In order to  
249 use the broad range of tools, a UMM model must be a special kind of UML model. Thus, the UMM

250 base module is based on the UML meta model. In fact, it provides a UML Profile consisting of  
251 stereotypes, tag definitions and constraints.

### 252 3.4.3 Caveats and Assumptions

253 This specification makes the following assumptions:

- 254 • This UML profile is based on the UML meta-model version 2.1.2. This version is the current OMG  
255 version. Using another UML meta-model as a basis for the development of a UMM compliant  
256 business collaboration model may not deliver correct results.
- 257 • The basic concepts of the UMM and the way they relate to each other are described and explained  
258 by means of a meta model (to be found in the non-normative “conceptual description” sections of  
259 this document).

### 260 3.5 Structure of the UMM Base Module

261 The UMM base module provides common data types, which may be used by the UMM foundation module  
262 or by other specialization and extension modules. This version of the base module consists of three artifacts  
263 named “*blInformation*” (BusinessInformation), “*InfEnvelope*” (InformationEnvelope) and “*bLibrary*” (Business  
264 Library).

265 A *business library* is realized as a package. Elements which inherit from a *business library* (or subtypes of it),  
266 are candidates for registration in a registry. A *business library* therefore acts as container for elements,  
267 which should be registered and retrieved together to be semantically complete.

268 *BusinessInformation* is realized as a class and represents the abstract concept of a business document  
269 exchanged in a business transaction between two business partners. In order to allow for an arbitrary  
270 *business information* to be exchanged in a UMM business transaction, the UML class based business  
271 information representation must inherit from a *BusinessInformation* or subtypes thereof.

272 An *InformationEnvelope* is a subtype of a *BusinessInformation* and represents a concrete business message  
273 which is exchanged in a UMM business transaction.

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275

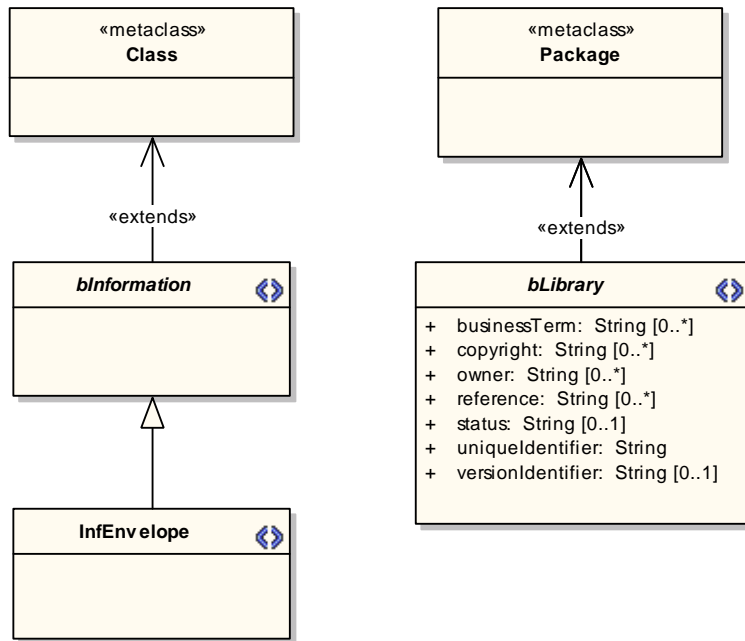
276 **4 UMM Base Module**

277 **4.1 Abbreviations of Stereotypes**

Stereotype Abbreviation	Full Stereotype Name
bInformation	BusinessInformation
bLibrary	BusinessLibrary
InfEnvelope	InformationEnvelope

278

279 **4.2 Stereotypes and Tag Definitions (normative)**



280

281

Figure 2 UMM Base Module – Abstract Syntax

282

Stereotype	bLibrary (BusinessLibrary)	
Base Class	Package	
Parent	-	
Description	A business library is a container for objects, which together build a semantic unit.	
Tag Definition	businessTerm	
	Type	String
	Multiplicity	0..*
	Description	A business term is a synonym, by which a business entity is commonly known.

copyright	
Type	String
Multiplicity	0..*
Description	Holds information about the copyright of a business library.
owner	
Type	String
Multiplicity	0..*
Description	The owner of the business library, who might be an organization, an institution or an individual.
reference	
Type	String
Multiplicity	0..*
Description	Identifies references to additional resources, where continuative information about the business library could be found.
status	
Type	String
Multiplicity	0..1
Description	An indicator for the current lifecycle status of an object if the object is registered in a registry. If so, the status must be set by the registry.
uniqueIdentifier	
Type	String
Multiplicity	1
Description	A unique identifier uniquely represents a business library if it is stored in a registry. There are no specific rules for the structure of the identifier; however the preferred identification scheme is the ITU-T Rec. X.667 ISO/IEC9834-8 Universally Unique Identifier (UUID) scheme. Implementers are free to use this scheme, or choose any other structure scheme, providing it guarantees uniqueness within the library to which it belongs.
versionIdentifier	
Type	String
Multiplicity	1
Description	A unique identifier representing the version of a business library if it is stored in a registry. There are no specific rules for the structure of the identifier; however the preferred identification scheme is the ITU-T Rec. X.667 ISO/IEC9834-8 Universally

		Unique Identifier (UUID) scheme. Implementers are free to use this scheme, or choose any other structure scheme, providing it guarantees uniqueness within the library to which it belongs.
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283

Stereotype	<b>biInformation (BusinessInformation)</b>
Base Class	Class
Parent	-
Description	A <i>BusinessInformation</i> realizes abstract business document information that is exchanged between authorized roles performing activities in a business transaction. Since a <i>BusinessInformation</i> is defined as abstract it cannot be used directly in order to set the type of exchanged information in a <i>BusinessInformation</i> . Instead the concept of an <i>InformationEnvelope</i> is used.

284

Stereotype	<b>InfEnvelope (InformationEnvelope)</b>
Base Class	Class
Parent	-
Description	An <i>InformationEnvelope</i> is a subtype of a <i>BusinessInformation</i> and represents a concrete business message which is exchanged in a UMM business transaction. Any business document artifacts are connected to an <i>InformationEnvelope</i> using associations.

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286

287 **Copyright Statement**

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289 Copyright © UN/CEFACT 2007. All Rights Reserved.

290 This document and translations of it may be copied and furnished to others, and derivative works that  
291 comment on or otherwise explain it or assist in its implementation may be prepared, copied, published and  
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