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UN/CEFACT's Modeling Methodology (UMM)

UMM Meta Model – Base Module

Candidate for 2.0

Internal Draft

NOT FOR IMPLEMENTATION

2008-04-11

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34 **1 About this Document**

35 **1.1 Status of this Document**

36 This document is currently being developed, and is at Open Development Process Step 4: “Internal
37 Draft Review”

38 (i) Activities

39 The parent PG circulates the Internal Draft within the group, to other PGs as appropriate,
40 and among project stakeholders and contributing domain experts, inviting comments.
41 The project team logs and processes comments and circulates updated Internal Drafts.
42 The comment/update/circulation cycle continues until the PG approves a project team
43 recommendation to conclude ODP4. While the criteria, evaluation, and ultimate decision
44 to conclude ODP4 is left to the PG, the PG must ensure that the project team has met all
45 comment processing requirements (see Annex I). The draft resulting from this step is
46 called a Public Draft.

47 (ii) Artifacts

48 Typical artifacts produced by ODP4 include:

- 49 a. Public Draft
- 50 b. Comment log.

51 The first review cycle of ODP 4 is open until 16th June 2008. Please send your comments to the
52 Project Lead Christian Huemer (huemer@big.tuwien.ac.at)

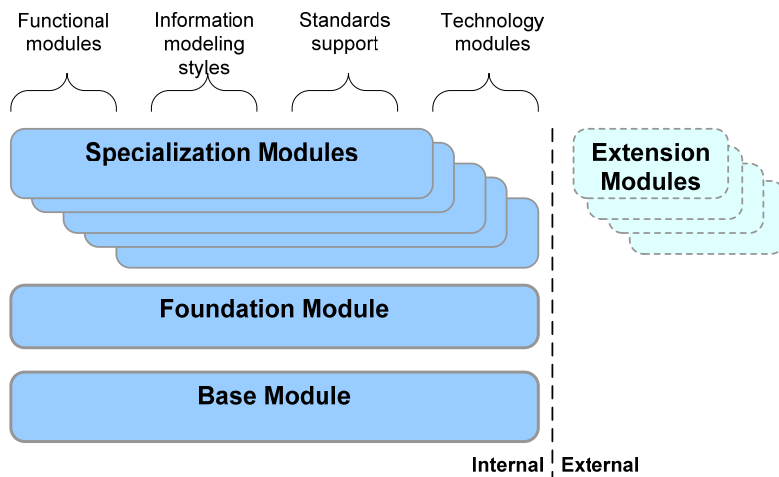
53 **1.2 Revision History**

Version	Release	Date	Comment
Candidate for 2.0	First Working Draft	2008-04-11	
Candidate for 2.0	Second Working Draft		
Candidate for 2.0	Final Working Draft		
Version 2.0	Technical Specification		

54 **1.3 Document Context**

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

58



59

60

Figure 1 Module structure of the UMM meta model

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

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

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

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

73

74 This specification defines the base module of UMM 2.0.

75

76 2 Project Team

77 2.1 Disclaimer

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

82 2.2 Contact

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

112

113 3 Introduction

114 3.1 Audience

115 A reader of the document MUST have a deep understanding of UML 2.1.2. She or he MUST be able to
116 understand meta models denoted as UML class diagrams. She or he SHOULD be familiar with the
117 UML 2.1.2. meta model, at least she or he MUST be able to check back the UML 2.1.2. meta model.
118 The reader SHOULD be familiar with OCL 2.0 in order to understand the OCL constraints of this UMM
119 profile – those who are not familiar with OCL are provided with a plain text description of the
120 constraint.

121 The information described in this manual is aimed at

122 advanced business process modelers that verify a UML model for UMM compliance (if not
123 supported by a tool)

124 advanced business process modelers who train other business process modelers and
125 business process analysts

126 software designers who want to produce UML tools providing support for this UMM
127 foundation module

128 software designers who want to produce tools to transform UMM compliant business
129 collaboration models into specifications of the IT-layer (ebXML, Web Services, UN/EDIFACT,
130 etc.).

131 software designers who want to produce repositories to register UMM compliant business
132 collaboration models

133 3.2 Related Documents

134 UN/CEFACT

135 ○ UN/CEFACT Open Development Process (TRADE/R.650/Rev.4/Add.1/Rev.1 - 19 April 2007)
136 http://www.unece.org/cefact/cf_plenary/plenary07/trd_R650_Rev4_A1E.pdf

137 ○ UPCC 1.0 - UML Profile for Core Components
138 <http://unstandards.org:8080/display/public/UPCC++UML+Profile+for+Core+Components>

139 ○ Core Component Technical Specification
140 http://www.unece.org/cefact/ebxml/CCTS_V2-01_Final.pdf

141 ○ Core Component Message Assembly
142 <http://www.unstandards.org:8080/display/public/CCMA++ODP+3++1st+Working+Draft>

143 International Organization for Standardization (ISO)

144 ○ Open-edi Reference Model. ISO/IEC 14662
145 [http://standards.iso.org/ittf/PubliclyAvailableStandards/c037354_ISO_IEC_14662_2004\(E\)](http://standards.iso.org/ittf/PubliclyAvailableStandards/c037354_ISO_IEC_14662_2004(E).zip)
146 .zip

147 Object Management Group (OMG)

148 ○ Unified Modeling Language Specification (UML), Version 2.1.2
149 <http://www.omg.org/docs/formal/07-02-05.pdf>

150

151

152 3.3 UN/CEFACT's Modeling Methodology (UMM): Overview

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

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

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

178 Business Requirements View (bRequirementsV)

179 Business Choreography View (bChoreographyV)

180 Business Interaction View (bInteractionV)

181

182 **Business Requirements View (bRequirementsV):** The Business Requirements View is used to gather
183 existing knowledge. It identifies the business processes in the domain and the business problems that
184 are important to stakeholders. It is important at this stage that business processes are not
185 constructed, but discovered. Stakeholders might describe intra-organizational as well as inter-
186 organizational business processes. All of this takes place in the language of the business experts and
187 stakeholders. The business requirements view results in a categorization of the business domain
188 (manifested as a hierarchical structure of packages) and a set of relevant business processes
189 (manifested as use cases). The result may be depicted in use case diagrams. In order to model the
190 dynamics of each business process, one may use a Business Process Activity Model, or a Sequence
191 Diagram, which would be placed beneath the Business Process Use Case. As a practical note, the
192 Business Process Activity Model may depict a process or processes which involve one or more
193 Business Partners. A Sequence Diagram will depict information exchanges between two or more
194 Business Partners. The Business Partners are described within their own package (Business Partner

195 View). A Business Process Activity Model may show state changes to Business Entities. Business
196 Entities are “real-word” things having business significance and are shared among the business
197 partners involved in the collaboration. The Business Entities and their lifecycles of state changes are
198 modeled in the Business Entity View. Furthermore, the Business Entity View also contains one or
199 more packages which represent the conceptual data structures of the Business Entities.

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

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

228 3.4 Objectives

229 3.4.1 Goals of the Technical Specification

230 The goals of this specification are:

231 To define a set of data types that may be shared between the UMM Foundation module and
232 different UMM Specialization modules

233 To define the fundament on which constitutive UMM specifications may based upon.
234

235 3.4.2 Requirements

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

237 The UMM Base module contains only stereotypes that are currently used in the UMM
238 Foundation module or in a UMM specialization and extension modules
239 Today, the UML is the most commonly supported modeling language by modeling tools. In
240 order to use the broad range of tools, a UMM model must be a special kind of UML model.
241 Thus, the UMM base module is based on the UML meta model. In fact, it provides a UML
242 Profile consisting of stereotypes, tag definitions and constraints.
243

244 3.4.3 Caveats and Assumptions

245 This specification makes the following assumptions:

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

252 3.5 Structure of the UMM Base Module

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

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

260 *BusinessInformation* is realized as a class and represents the abstract concept of a business
261 document exchanged in a business transaction between two business partners. In order to allow for
262 an arbitrary *business information* to be exchanged in a UMM business transaction, the UML class
263 based business information representation MUST inherit from a *BusinessInformation* or subtypes
264 thereof.

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

267

268

269 **4 UMM Base Module**

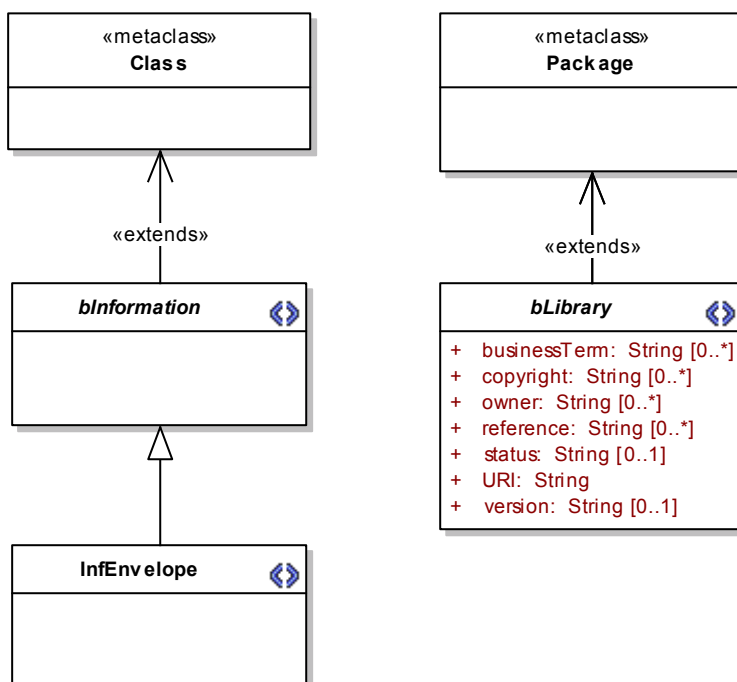
270 **4.1 Abbreviations of Stereotypes**

Stereotype Abbreviation	Full Stereotype Name
bInformation	BusinessInformation
bLibrary	BusinessLibrary
InfEnvelope	InformationEnvelope

271

272 **4.2 Stereotypes and Tag Definitions (normative)**

273



274

275

Figure 2 UMM Base Module – Abstract Syntax

276

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.
URI	
Type	String
Multiplicity	1
Description	If the object is registered in a registry the namespace is determined by a URI (uniform resource identifier). The URI is a concatenation of the name of the instance (local name) and the version of this instance; it MUST be a valid uniform resource name (URN). Example: http://www.untmg.org/MyBusinessCollaboration_1_0
version	
Type	String
Multiplicity	0..1
Description	Holds the current version of the object if it has been registered in a registry. Each registered object SHOULD have version information and it SHOULD be set and maintained by the responsible registry.

Stereotype blInformation (BusinessInformation)	
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.

278

Stereotype InfEnvelope (InformationEnvelope)	
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.

279

280

281 **Copyright Statement**

282

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