ebIX® Rules for the use of UN/CEFACT Modelling Methodology (UMM) version 2

Status:	Approved by ETC
Version:	1.1
Revision:	-
Date:	January, 2014

Contents

0. Introduction

This document describes the way in which the ebIX® UML model for the European Energy Market is constructed.

1. References

1.1. Standards

[1] The Harmonized Role Model (for the Electricity Market) by ebIX®, ENTSO-E, and EFET (www.ebix.org)

[2] UML Profile for UN/CEFACT's Modelling Methodology (UMM), Base Module 2.0., (http://www.unece.org/cefact/umm/umm_index.html)

[3] UML Profile for UN/CEFACT's Modelling Methodology (UMM) Foundation Module Version 2.0 Technical Specification 2011-04-01http://www.unece.org/cefact/umm/umm_index.html)

[4] UN/CEFACT UML Profile for Core Components Technical Specification 3.0 (http://www.unece.org/fileadmin/DAM/cefact/codesfortrade/UPCC_UML-CoreComponent.pdf)

[5] Core Components Technical Specification (http://www.unece.org/cefact/codesfortrade/ccts_index.html)

[6] UN/CEFACT XML Naming and Design Rules Technical Specification Version 3.0, 17 December 2009 (http://www.unece.org/cefact/xml/xml_index.html)

1.2. UML tooling standards

The ebIX® model has been created using the UML modelling tool MagicDraw. The tool is, among others, based on the following standards:

- UML 2.3,
- OCL 2.0,
- XMI 2.1,
- EMF UML 2.x XMI

1.3. Main changes since last version

	Subject	Old	New	Clarification	Date
Version 1.1					
	• Updated references • Updated chapter 4.1, Naming convention • Addition of new chapter 8, Enumerations				2014-01-29

	• Correction of spelling errors and update of document layout				

2. Profiles available for use in ebIX® models

	Profile	Contains	Uses profile
A	UML_Standard_Profile.xml	UML Standard profile	-
B	UMM2 – Profile.mdxml	UMM 2.0 Base Module UMM 2.0 Foundation Module	A
C	UMM2 – Profile - Long.mdxml	UMM 2.0 Base Module, Long UMM 2.0 Foundation Module, Long	A
D	UPCC profile.mdxml	UN/CEFACT Profile for the use of Core Components	A, B
E	CEFACT Profile.mdxml	UN/CEFACT code lists UN/CEFACT qualifier lists UN/CEFACT Core Components (ACC, ASCC, CDT)	A, B, C, D
F	Edifact 08A.mdxml	UN/CEFACT Standard Messages (UTILMD and UTILTS)	A, B, D, E
G	ebIX® Profile.mdxml	ebIX® meta model elements (stereotypes & tag definitions) ebIX® code lists (incl. national code lists) ebIX® qualifier lists ebIX® Core Components (ABIE, ASBIE, BDT)	A, B, C, D, E, F
H	Harmonised Role Model.mdxml	ebIX-EFET-ENTSO-E Harmonised Role Model	A, G

2.1. Profile description

Remarks:

- Stereotypes in all profiles are contained in special “profile packages” (in order to make them available for the transformation).

2.1.1. UML Standard Profile

The UML standard profile used is made available by MagicDraw.

2.1.2. UMM 2.0 Base Module - UMM 2.0 Foundation Module

These modules contain the UMM-2 stereotypes as defined by the UN/CEFACT Technique and Methodology Group (TMG).

These modules are combined in one separate project called “UMM2 – Profile”.

Remarks on 2 types of UMM profiles (“normal” and long):

- The two UMM profiles (UMM2 – Profile.mdxml and UMM2 – Profile - Long.mdxml) basically have the same content. Names for elements are abbreviated in the “normal” profile and are not abbreviated in the long profile.
- ebIX® uses long stereotypes in the Business Requirements View (BRV) for better understanding by business representatives. In the Business Choreography View (BCV) and in the Business Information View (BIV) ebIX® uses short stereotypes.
- As a consequence ebIX® has created a second version for the UMM2-profile using the long names.
- Business Entities are stereotyped with the short stereotype <<bEntity>> since these entities are used in both the Requirements and the Information View.

2.1.3. UML Profile for Core Components

This module contains the stereotypes for Core Components as defined by TMG and the CCMA stereotypes for message assembly in separate packages.

This module also contains the 6 primary data types (PRIMs) as required by UPCC in CCTS version 2.01 dd 15-11-2003.

Remarks:

- Definitions for the PRIMs are mainly taken from the CCTS proposal for version 3.0.

2.1.4. CEFACT Profile

This module contains CC’s, CDT’s, codes and qualifiers as defined by UN/CEFACT.

Remarks:

- CEFACT code lists that serve as the origin for ebIX-subsets are included in this module; the package containing these enumerations are stereotyped <<ENUMLibrary>>.

- CEFACT qualifiers that serve as the origin for ebIX-subsets are included in this module; the package containing these qualifiers are not stereotyped. The enumerations are stereotyped <<Qualifier>>.
- The by ebIX® created enumeration for the CEFACT directory versions is also included in this module (in the package for codes).

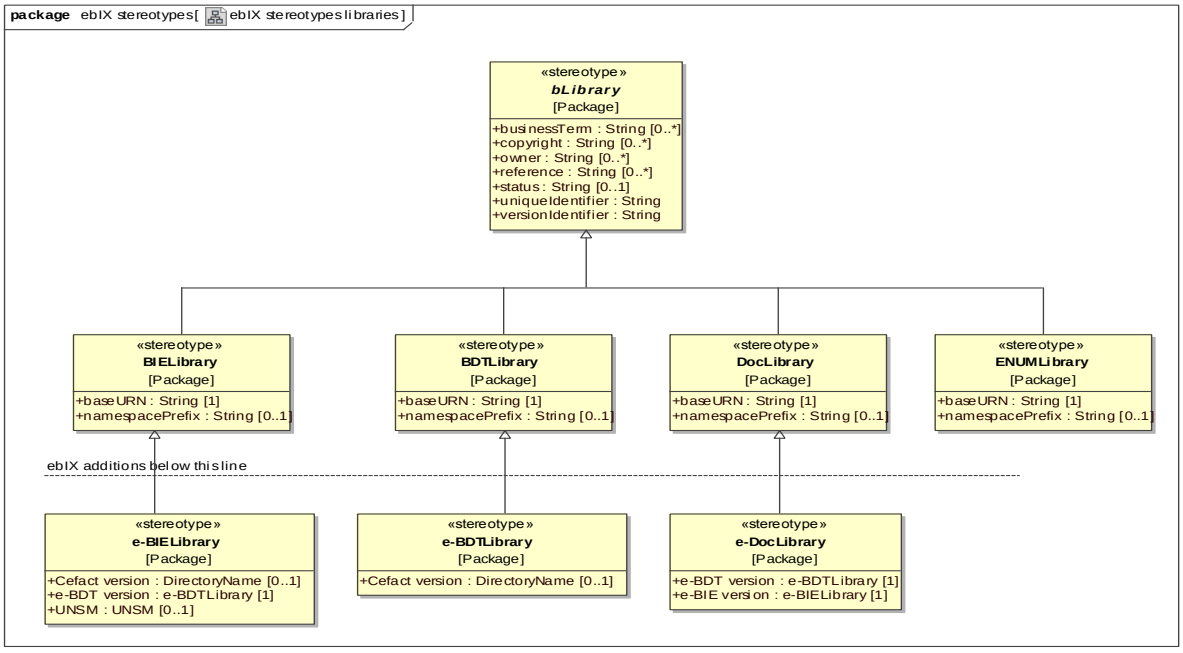
2.1.5. ebIX® Profile

This module contains:

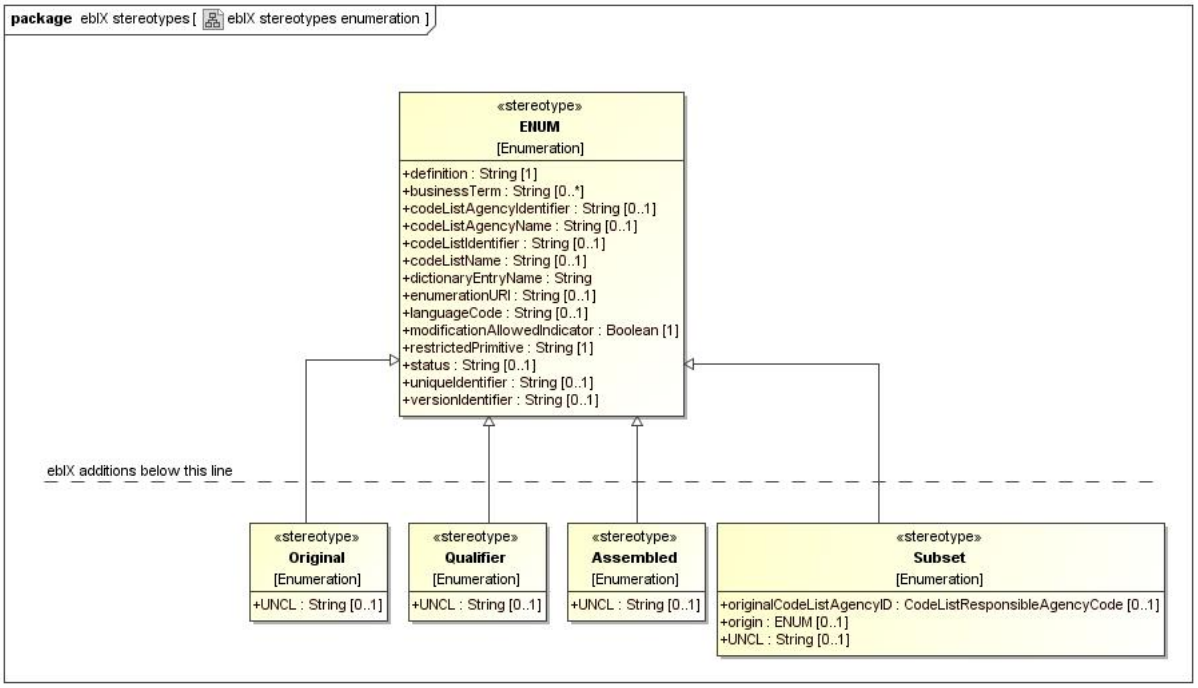
- stereotypes and tag definitions as defined by ebIX® in the package "Common" within the profile package "ebIX® Profile";
- ebIX® codes and qualifiers, BIE's and BDT's are within the package "ebix:org"

2.1.5.1. ebIX® stereotypes and tag definitions

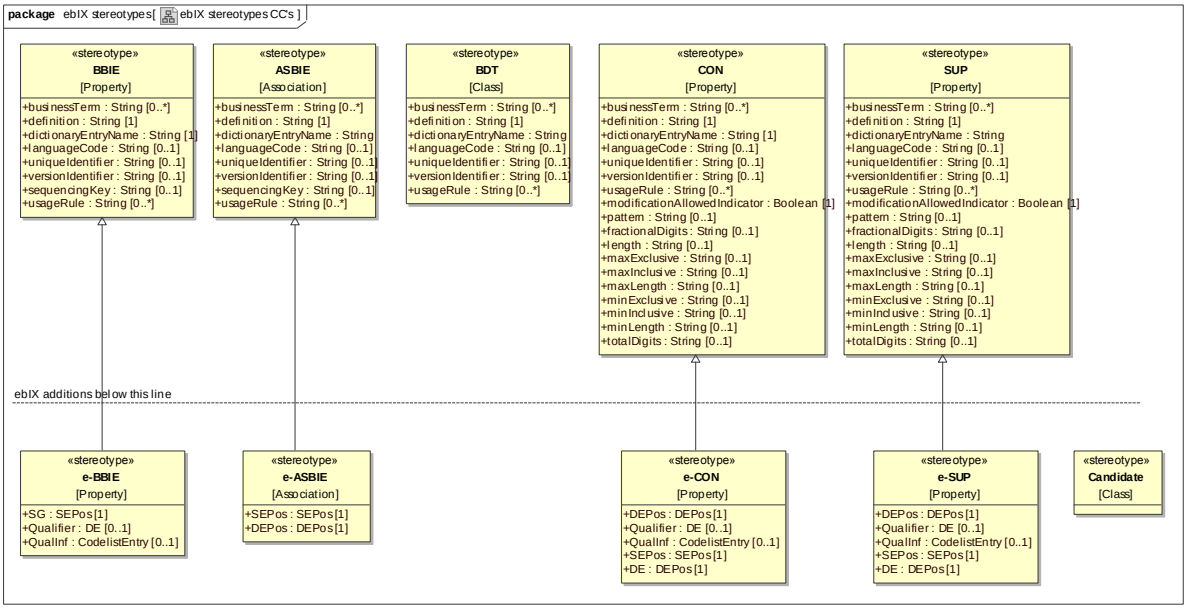
2.1.5.1.1. Libraries



2.1.5.1.2. Enumerations

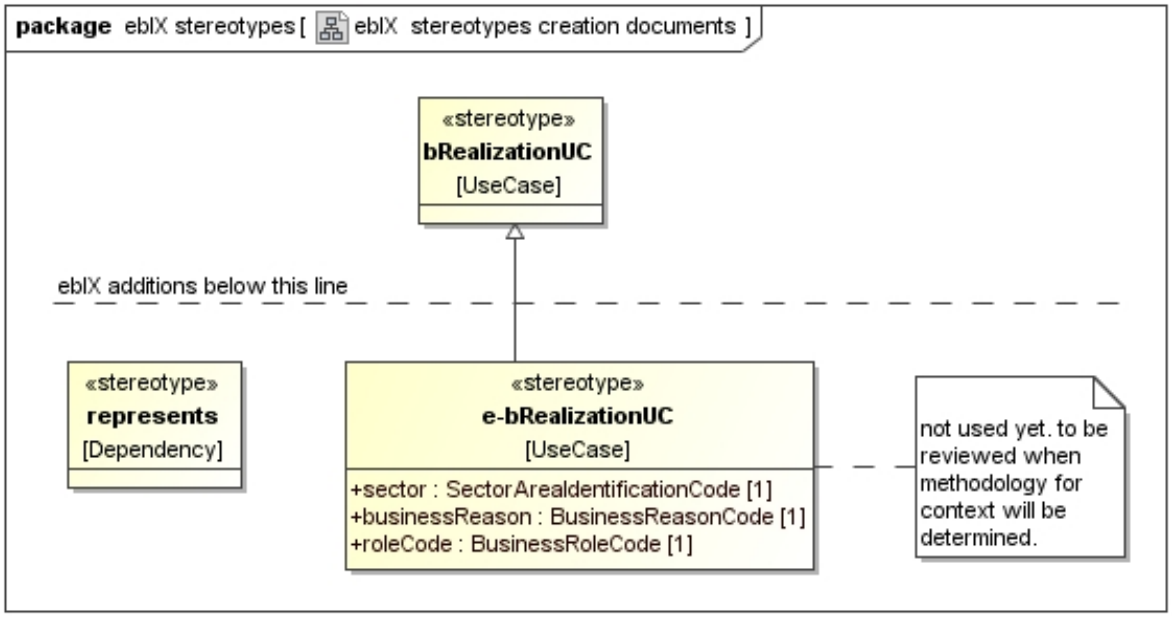


2.1.5.1.3. CC's

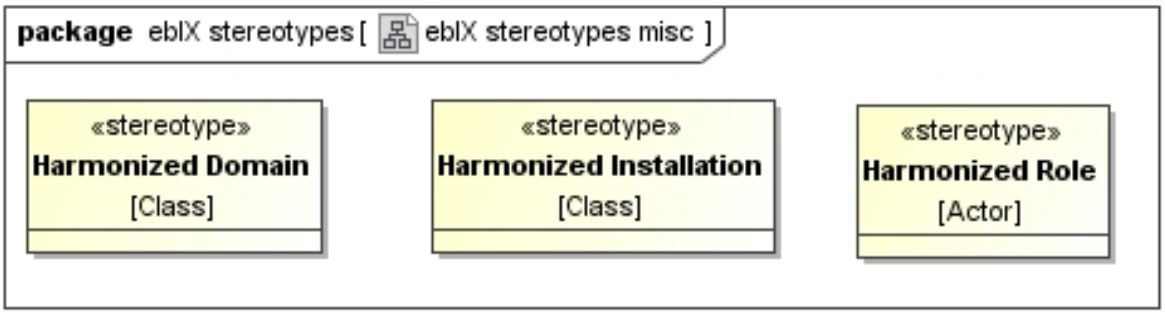


Remark: the stereotypes reflecting the ebIX® additions contain tagged values for the mapping to EDIFACT. The mapping to EDIFACT is not elaborated in this document.

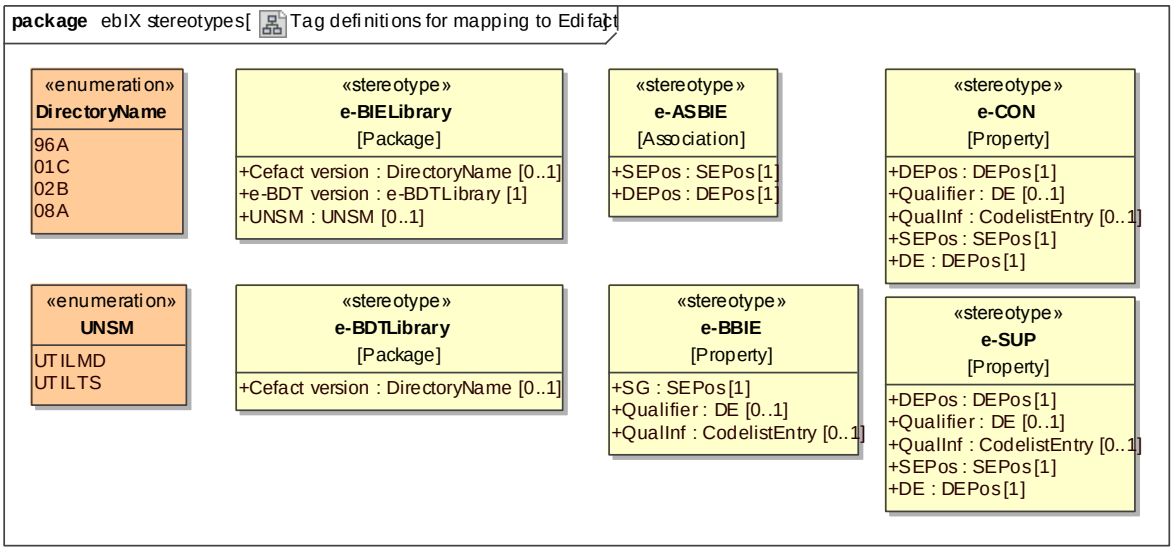
2.1.5.1.4. Creation of document



2.1.5.1.5. ebIX® stereotypes for the Harmonised Role Model



2.1.5.1.6. ebIX® mapping to EDIFACT



Remarks:

- UseCases representing the ebIX® Market Domains in the Collaboration View are not stereotyped (since they do not qualify as collaboration according to UMM). UseCases for the ebIX® Market Domains in the Requirements View are stereotyped as <<BusinessProcessUseCase>>.

- For mapping to EDIFACT tagged values are added to BIE's and BDT's.

2.1.6. Harmonised Role Model

This module contains all harmonised roles, domains and installations.

This module is included in separate project called "Harmonized Role Model".

Remarks:

All roles, domains and installations are included in the main package "Harmonised Role Model". This package is not stereotyped.

ebIX® creates diagrams containing a relevant subset per relevant process cluster (like business domain) from the available classes, actors and relations to be shown.

All roles, domains and installations are stereotyped. The stereotypes are specified in the ebIX® profile. Stereotypes used: <<Harmonized Role>>, <<Harmonized Domain>> and <<Harmonized Installation>>.

In a separate package, "Roles-Domains-Installations to be introduced" may be found. This package is not stereotyped and neither are the roles/domains/installations in this package.

Association classes (for contracts) shall be added per project to the proposed elements package and then discussed and approved by ebIX® ETC and then added to the package “EEM common elements”.

3. European Energy Market

The project “European Energy Market” uses the following profiles:

- UML Standard Profile
- UMM 2.0 Base Module (long and short)
- UMM 2.0 Foundation Module (long and short)
- UML Profile for Core Components
- CEFACT Profile
- ebIX® Profile
- Harmonized Role Model
- EDIFACT 08A Profile

The model for the European Energy Market contains the ebIX® Market Domains in separate packages which in turn contain the ebIX® modelled processes and business information.

This complete model is included in a stand-alone project called “European Energy Market”.

3.1. Remarks

The packages containing a Market Domain are stereotyped with <<bCollModel>>. These packages also contain the top UseCase for their Market Domain.

Market Domain UseCases are linked to the UseCase for European Energy Market (<<includes>>) within the project for the European Energy Market (UseCase Diagram).

Each package containing a Market Domain has been exported as a module into a separate UML-project with the name “EEM-<market domain name>”. In this way the separate projects can be developed independently in different locations. The overall project for the European Energy market uses these projects.

When a Market Domain-project needs to link its modelled elements to elements from another Market Domain-project, this latter project must be used as a module.

An additional package called “Proposed Model Elements” may be added to each package containing a Market Domain. In this additional package proposed new elements may be placed pending approval for general use.

3.2. File organization

All projects are supposed to be placed in one project directory (except the UML-profile as provided by MagicDraw).

4. Business Requirements View (BRV)

ebIX® work groups will follow UN/CEFACT recommendations as defined in UMM-2 for the creation of the Business Requirements.
However ebIX® can accept business requirements from external business users that do not comply to UMM-2 rules.

4.1. Naming convention

ebIX® has no strict naming convention for elements within the BRV. It is however advised to use Upper Camel Case with a space between the words for naming UMM objects, such as Business Areas, Process Areas, Business Entities and attributes.

4.2. Swim lanes

In activity diagrams, within BRV, ebIX® uses only swim lanes if the actions really belong to one business partner. If not, then a swim lane is not used. Consequently, one (or more) swim lane(s) may be combined with call actions that do not belong to a swim lane.

When swim lanes are used, the final nodes (like BusinessSuccess or BusinessFailure) will appear only in the swim lane that contains the initial node.

4.3. Entities

Business users may define entities as a consequence of the need for states that can help to precisely describe the business process.
ebIX® defines entities as a consequence of the need for states in the BCV. In line with UMM-2 ebIX® does not use the stereotype <<BusinessInformation>> (from UMM Base Module) in the BRV. Therefore all entities are stereotyped <<bEntity>>.

The need for states is identified during the modelling process. Therefore, during the modelling process these entities will be stored in a package under BRV for each project (Structure or Measure) or within separate packages for each process within a project.

State diagrams will be created within the BRV for external states. ebIX® is not interested in the specification of internal states (see also 4.4).

An entity may retain several state machines for different purposes in different business processes.

4.4. States

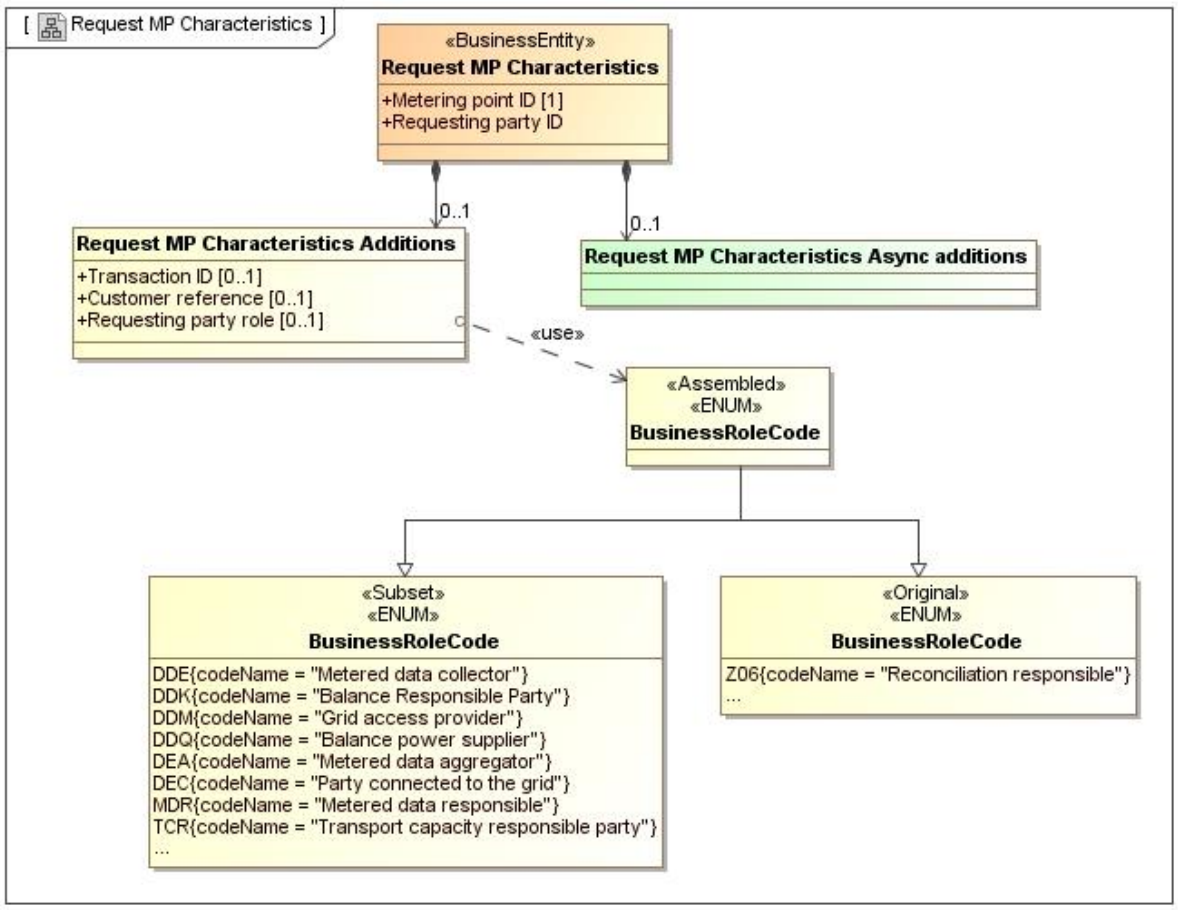
ebIX® models revolve around efficient data alignment. Therefore ebIX® models are focused on <<SharedBusinessEntityState>>. In ebIX® models the <<bInternalState>> is normally not used.

In the activity diagrams representing the <<BusinessProcess>> the element representing the <<SharedBusinessEntityState>> will be placed *in between* the two swim lanes involved.

4.5. Code values

The allowed code values in the class diagrams in the BRV are shown in the enumeration by means of limiting the set of values that is shown (the function “Edit compartment” in MagicDraw). One or more enumerations are linked through their <<Assembled>> enumeration to the property in the <<bEntity>> or class. The usage-relation is used between attribute and enumeration.

See example below:



Note:

- *When a new literal is added to this enumeration, this new one will appear in all subsets! So maintenance is very relevant for this way of representing subsets for code lists.*
- *This rule is an ebIX® convention (not specified in UMM-2).*

5. Business Choreography View (BCV)

ebIX® models in the ChoreographyView:

- Transaction, based on one of the standard transaction patterns as included in UMM;
- Collaboration composed of transactions and/or nested collaborations;
- Realization representing the actual implementation of a collaboration for a specific set of business partners.

In BCV ebIX® does not model internal processes. But internal processes leading to internal states may have been specified in the BRV.

ebIX® includes a Realization for each Collaboration, even when the diagrams for the realization and collaboration look identical. ebIX® does so, because of UMM requirements and also because of future automated transformations to web services that will require recognizable entries.

5.1. Naming convention

Within the BCV ebIX® will use the UseCase-name also for elements and diagrams that belong to this UseCase.

5.2. Structure for BCV

5.2.1. UseCase

In the BCV the Transaction, Collaboration and Realization are placed on the same level (practically: these are specified on the same level next to each other in the packages with stereotypes <<bTransactionV>>, <<bCollaborationV>> and <<bRealizationV>>) .

UseCase Diagrams are to be placed within the UseCase itself.

For the UseCases ebIX® always puts the relations on the (local) level of the UseCase. Therefore the participate-association between a UseCase and an actor will be outgoing from the UseCase and thereby be placed at the location of the UseCase. Similarly for includes and depends.

5.2.2. Activity

In the Activity Diagrams for <<bTransaction>> ebIX® models show the type, the stereotype and the cardinality for the in- and output pins only for the output pins.

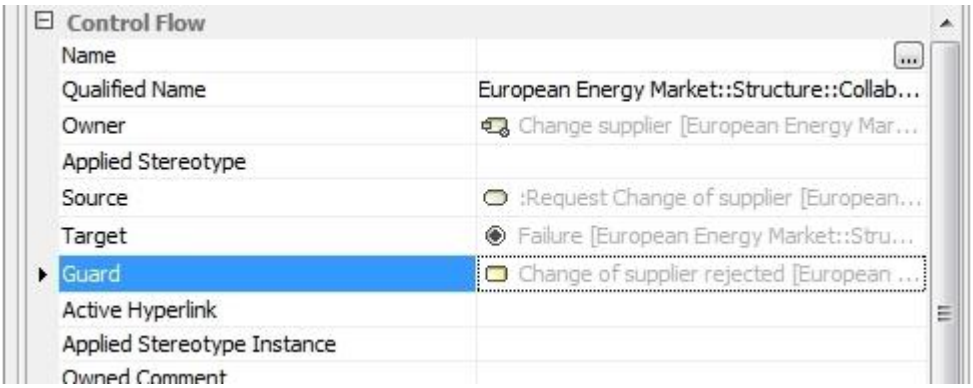
In line with UMM-2 ebIX® places <<BusinessEntities>> plus state machine plus states within the BRV under the EntityView. But the nodes that are created to specify the state for Activities (in BCV) are placed below the actual activity itself.

For the one-way transaction patterns (like Notification) business failure is not an option. Therefore only control failure is possible and as a consequence for the transaction pattern “Notification” the <<bESharedState>> shall only be specified as “Notified” or similar text.

A node representing an entity and its state and the final nodes (like BusinessSuccess or BusinessFailure) will appear only in the swim lane that contains the initial node (Initial).

When specifying guards in control flows (as UML element) used for change of transition (UMM) in <<bTransaction>> and <<bCollaboration>>, states from <<bESharedState>> shall be used in these guards specifying these by means of element values.[1]

example

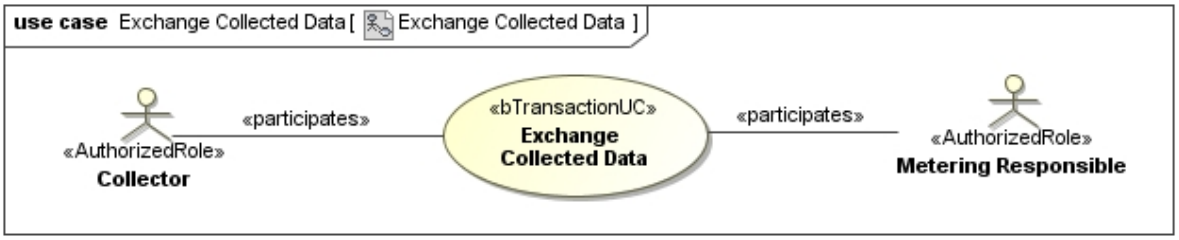


Each <<bTransaction>> specified in the ChoreographyView has to be included in at least one <<bCollaboration>>. Even when a <<bTransaction>> may be executed on its own a <<bCollaboration>> has to be created on top of it in order to allow a <<bRealization>> to be added.

5.3. Roles in BCV

In transactions ebIX® uses authorized roles as defined for that particular <<bTransaction>> and included in the package for that <<bTransactionUC>>.

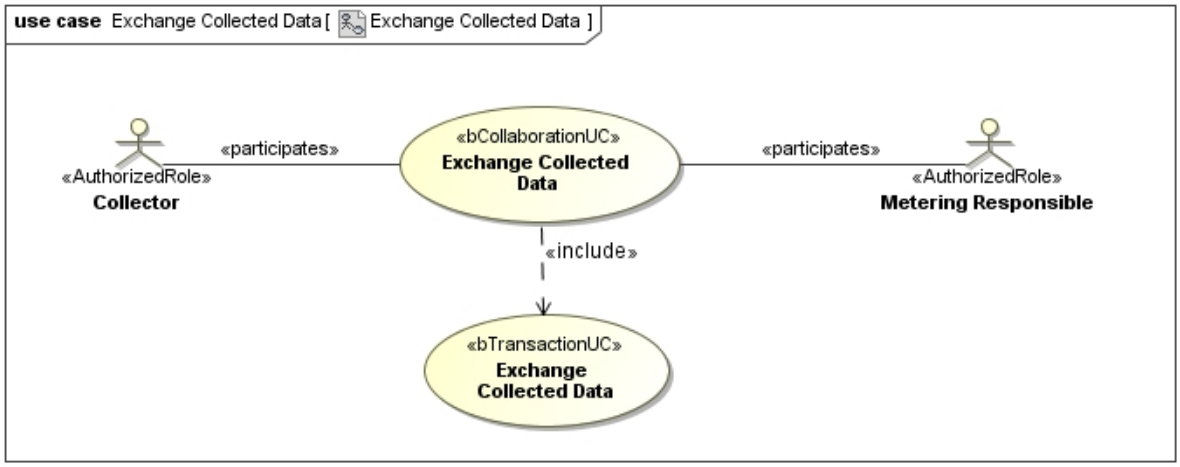
example



In collaborations ebIX® uses authorized roles as defined for that particular <<bCollaboration>> and included in the package for that <<bCollaborationUC>>.

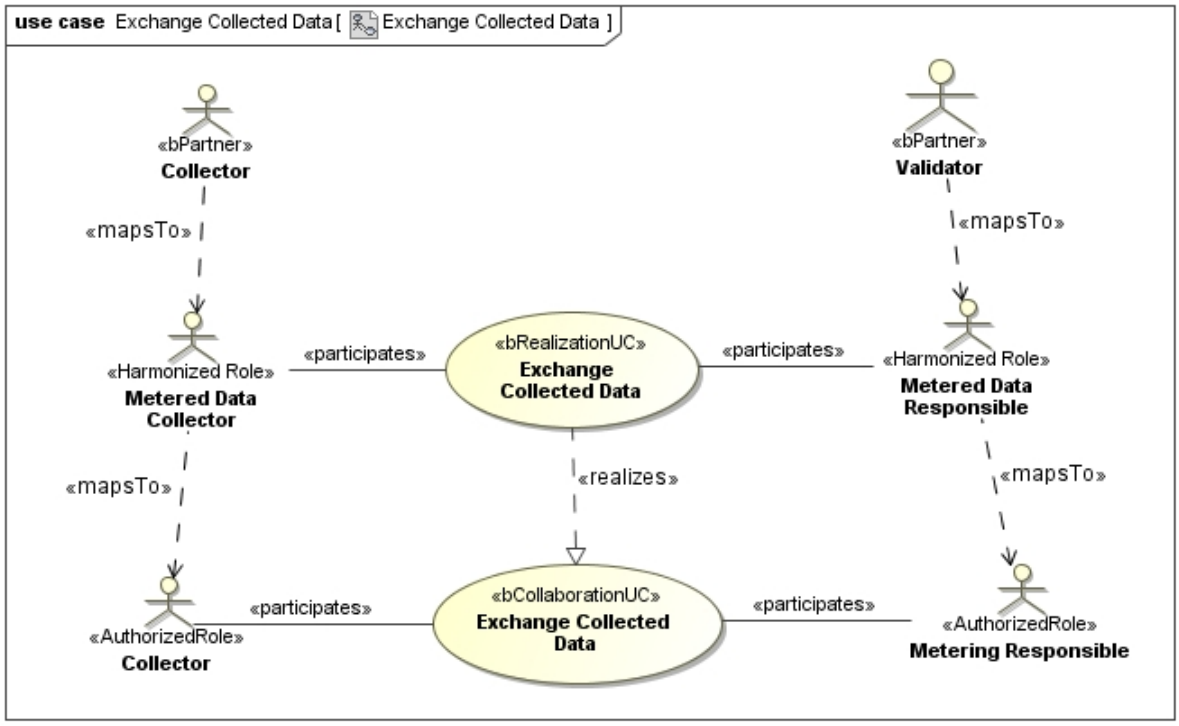
[1] This rule has not yet been implemented in all projects (status February 2012).

example



In realizations ebIX® uses harmonised roles from the role model for that particular <<bRealization>>. In the realization the business partner as specified and mapped to an harmonised role in the business requirements, is also shown as mapped to the harmonised role.

example



6. Business Information View (BIV)

In the Business Information View ebIX® models the set of information that shall be exchanged according to the business requirements.

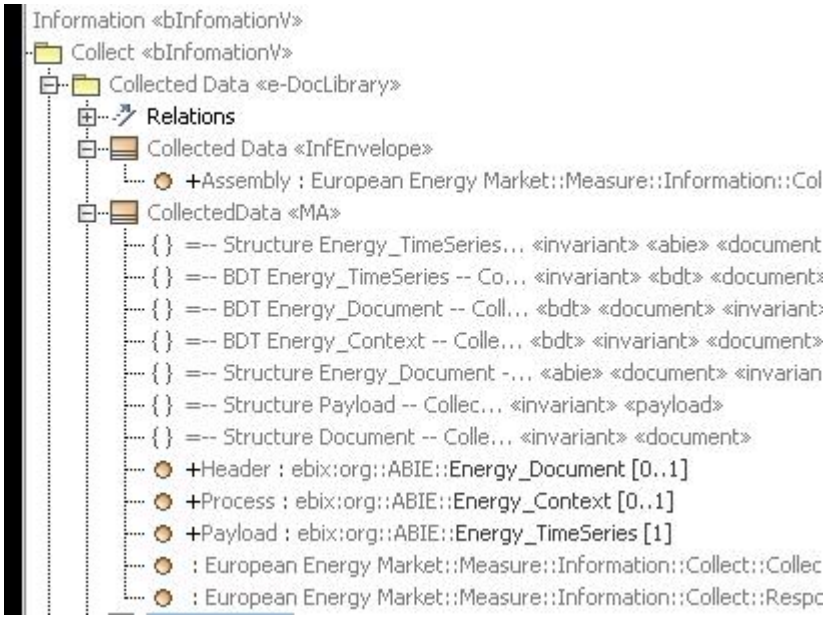
In this model, the set of information is composed of Core Components (ABIE's). Since the ABIE's used represent a set of information that is broader than required by the business requirements, ebIX® uses constraints created from OCL-statements to trim down the ABIE's to the seize required.
ebIX® follows the UN/CEFACT Core Components Technical Specification (and more in particular the paragraphs on Message Assembly (MA)) when creating the information models for the sets of information to be exchanged.

6.1. Structure for BIV

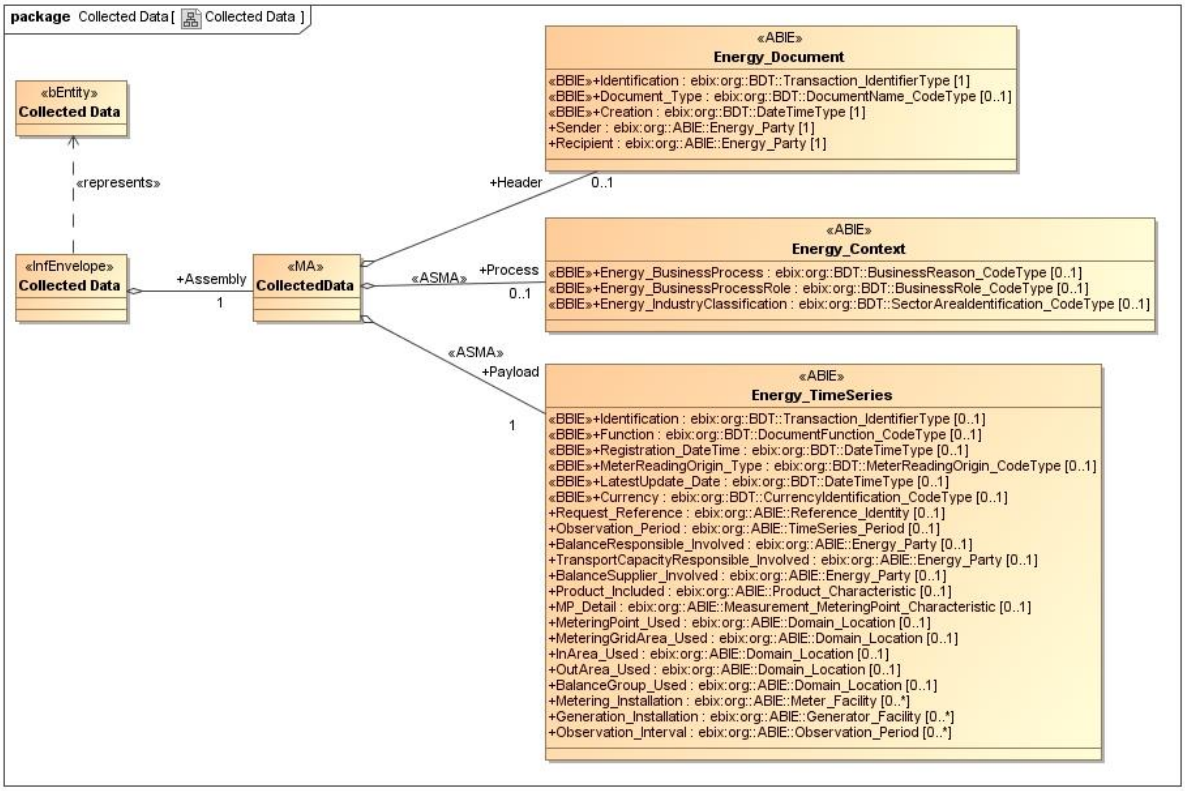
In the BIV ebIX® creates a package stereotyped as <<bInformationV>> for each (sub-) process for which ebIX® will create a separate document to be published.
Within this package other packages will be created with the stereotype <<e-DocLibrary>> for each modelled exchange of information. Within these DocLibrary-packages both the class stereotyped as <<InfEnvelope>> and the class stereotyped as <<MA>> (for Message Assembly) are created. The class stereotyped <<InfEnvelope>> is used to qualify the exchange relations and information pins in the BCV. The class stereotyped as <<MA>> is required by the Un/CEFACT CCTS.

The constraints with OCL-statements are placed directly below the class with <<MA>> in the UML-model.

example



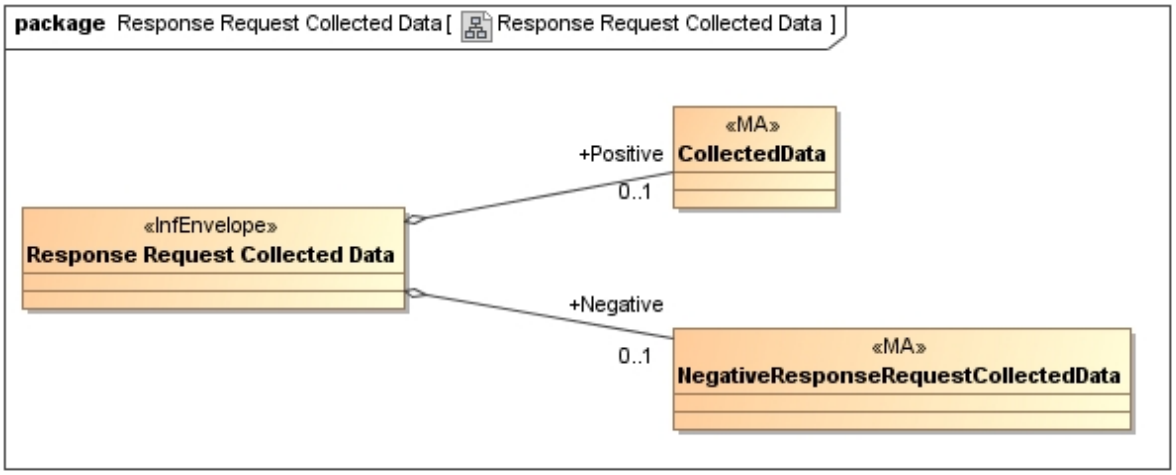
example



6.2. Options in responses

If there are options in responses (like a response can be either positive or negative) in ebIX® models the choice is to be modeled in the information flow (and not in creating options in the exchange process).

example



The class stereotyped with <<InfEnvelope>> is used to qualify a single response flow in the specification of the business transaction. The content of this class consists either of the collected data as requested (positive response) or of the negative response. An constraint containing OCL-statements specifying the dependency between the two options in placed directly below the class with <<InfEnvelope>> in the UML-model. The constraint is stereotyped <<dependency>>.

example

6.3. Naming convention

Within the BIV ebIX® will use within <<e-DocLibrary>> similar names for the class <<MA>> and the class <<InfEnvelope>>. The names cannot be exactly the same. Therefore in ebIX® models the name for <<MA>> is created as Upper Camel Case without spaces in between words, while the name for <<InfEnvelope>> is created with spaces in between words.

example

7. Core Components

7.1. Naming BIE's

a. The qualification term of the BIE- and BDT-names should give meaning to the BIE/BDT (e.g. DomainLocation). A qualification text may include energy, but this is not mandatory unless the BIE/BDT is special for the energy market and also may be used in other sectors.

7.2. Initial creating ABIEs

a. Take clusters from the existing BRV's (existing ebIX® models)
b. Try to find existing ACC's and create ABIE's that fit the existing requirements and the ACC.
c. Once found, base the ebIX® ABIE on the ACC found. The ABIE becomes a customized version of the ACC.
d. When an ACC that fits the requirements, cannot be found, define an new proposed ACC.
e. This ACC is stereotyped with both <<ACC>> and <<Candidate>>.
f. Create an ABIE from this ACC.
g. As a consequence, in ebIX® models ABIE's are not copied into BIV document packages, but used only (from the ebIX® profile package). This means that the content of the <<DOCLibrary>> will be limited to:
    i. The class that is stereotyped <<InfEnvelope>>. The name of the <<InfEnvelope>> consists of nouns/qualifying terms separated by spaces.
    ii. The class that is stereotyped <<MA>>
    iii. The relations stereotyped with <<ASMA>> between classes in the diagram not being <<ASBIE>>. (ASBIEs remain defined in the ebIX® module under BIELibrary and therefore are valid in the DOCLibrary as well).

7.3. When creating ABIEs from ACC:

a. Add a dependency from ABIE to ACC which is stereotyped <<based on>>
b. Customize BCCs into BBIEs where needed:
    i. Always replace the stereotype by <<BBIE>>
    ii. If needed change the name by adding a term in front;
    iii. If needed change the data type into a QDT;
    iv. If needed change the cardinality.
c. Allow restriction in PRIMTypes according to UN/CEFACT DT-catalogue (decimal can be restricted to integer, float or double).
d. CDTs as data type for BBIEs are not allowed. However it is possible the convert a <<CDT>> into a <<BDT>> without further qualification (but as a consequence the names and content has to remain unchanged.)

8. Enumerations

ebIX® uses a principle where enumerations from different organisations, such as ebIX® issued codes, UN/CEFACT codes and National codes are stored in separate packages. To be able to use the enumerations from different packages in the ebIX® model, the package "ebIX® assembled" has been created. The literals from separate packages are merged into one common enumeration using generalisations between the assembled enumeration and related enumerations from different organisations.

Enumerations are categorized into codes and qualifiers; qualifiers have been moved to a separate package within the ebIX® profile; the structure with empty <<Assembled>>-enumerations has been kept for the qualifiers as well (although at the moment there seems to be no direct benefit, since qualifiers will at the moment only be used for mapping to EDIFACT)

All ebIX® assembled codes are covered by BDT's (except for the enumerations for listResponsibleAgency and listIdentifier);

Only those packages containing codes that have to be transformed into XML-code lists are stereotyped with <<ENUMLibrary>>; others have no library-stereotype.

ebIX® keeps ISO-, ENTSO-E and national codes within the ebIX® module as external codes.

National codes that have been accepted by ebIX® and BIE's and/or BDT's that result from these codes, are kept within the ebIX® profile.

Date/time formats are combinations of patterns and values, e.g. "PT60M". For these combinations of patterns and values, it is possible to specify which formats to use using OCL statements. Note that this is strictly restricted to date/time patterns.

9. Use of tagged values in ebIX® model

UN/CEFACT has specified profiles to be used as the meta model for UMM[2]:

- UMM Base Module
- UMM Foundation Module
- UML Profile for Core Components

ebIX® has additionally specified a profile.

These profiles specify tag definitions. In the ebIX® model the following tag definitions are to be used[3].

9.1. Libraries

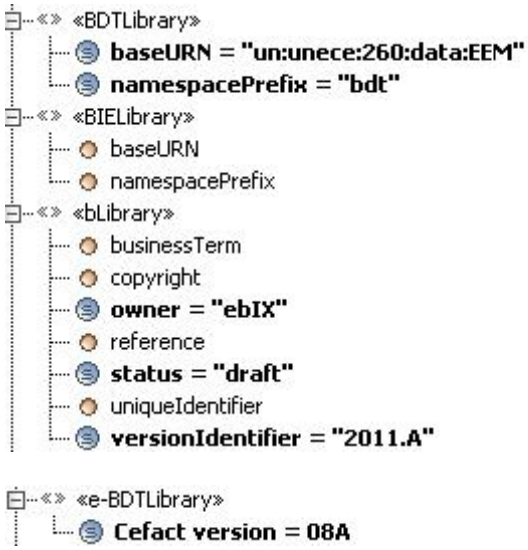
9.1.1. <<ABIE>>

[2] *See*

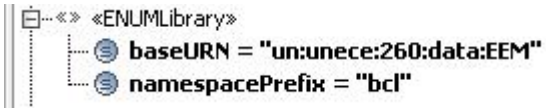
Profile description

[3] The tagged values in these examples are taken from the model version 2011.A.

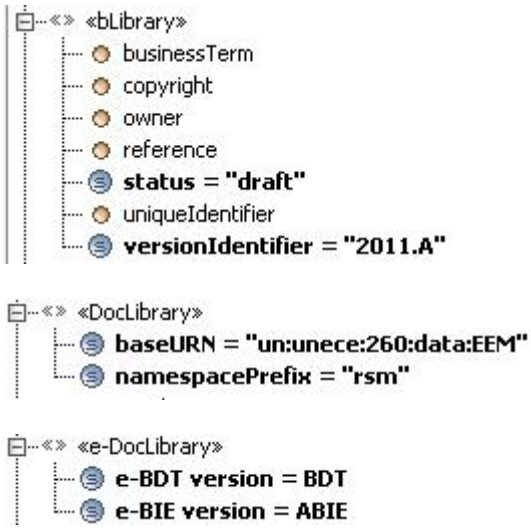
9.1.2. <<BDT>>



9.1.3. <<ENUM>>



9.1.4. <<DOC>>



9.2. Enumerations

«ENUM»
businessTerm
codeListAgencyIdentifier = "260"
codeListAgencyName
codeListIdentifier
codeListName = "BusinessDomainCode"
definition
dictionaryEntryName
enumerationURI
languageCode
modificationAllowedIndicator
restrictedPrimitive
status = "draft"
uniqueIdentifier = "000007"
versionIdentifier = "0.1.A"

«Original»
UNCL = "3496"

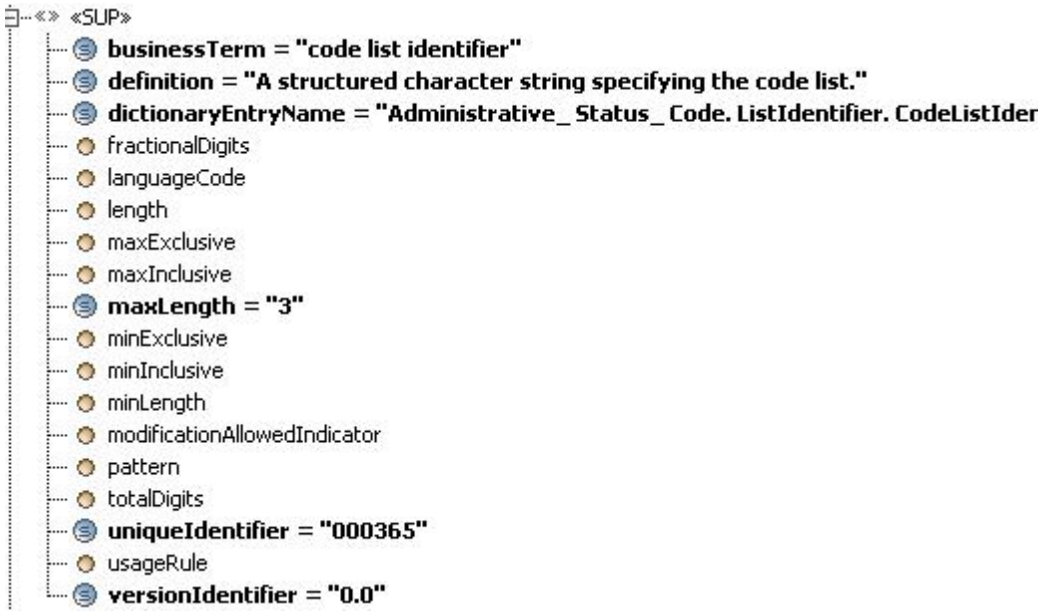
9.3. BDT

«BDT»
businessTerm = "administrative status"
definition = "The code specifying the administrative status."
dictionaryEntryName = "Administrative_ Status_ Code. Type"
languageCode
uniqueIdentifier = "000363"
usageRule
versionIdentifier = "0.0"

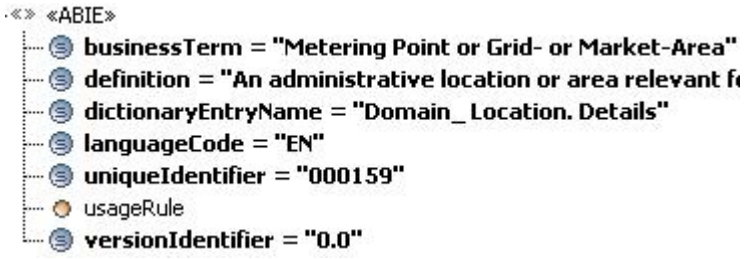
9.3.1. <<CON>>

«CON»
businessTerm = "administrative status"
definition = "A structured character string specifying the administrative s
dictionaryEntryName = "Administrative_ Status_ Code. Content. Administ
fractionalDigits
languageCode
length
maxExclusive
maxInclusive
maxLength = "3"
minExclusive
minInclusive
minLength
modificationAllowedIndicator
pattern
totalDigits
uniqueIdentifier = "000364"
usageRule
versionIdentifier = "0.0"

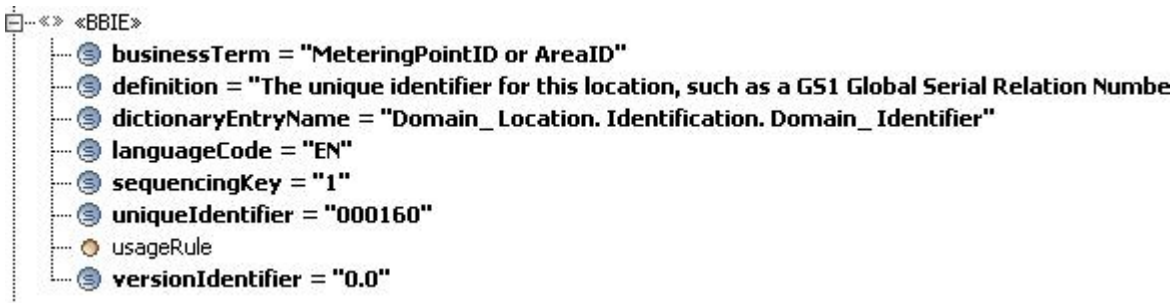
9.3.2. <<SUP>>



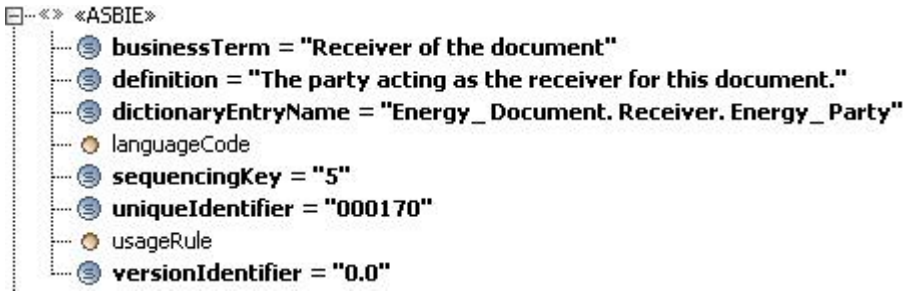
9.4. ABIE



9.5. BBIE



9.6. ASBIE



Remark:

the stereotypes reflecting the ebIX® additions contain tagged values for the mapping to EDIFACT. The mapping to EDIFACT is not elaborated in this document.

9.7. Process

9.7.1. Choreography View

No tags used at the moment.[4]

9.7.2. Other elements

None of the other UML-elements in the Choreography are at the moment specified in greater detail by means of tagged values. [2]

9.8. Information

9.8.1. Information View

The package containing packages for documents is stereotyped <<bInformationV>>, which is a CEFACT stereotype.

<< bInformationV >>
No tags used.

9.8.2. Document

The package containing the document information is stereotyped <<e-DocLibrary>>, which is an ebIX® stereotype that inherits from other CEFACT stereotypes.

<<bLibrary>>
Status

[4] To be defined when web services will be specified.

Version

<<DocLibrary>>
baseURN
namespacePrefix

<<e-DocLibrary>>
e-BDT version (value is selected package from containment tree)
e-BIE version (value is selected package from containment tree)

The root class for the document is stereotyped <<MA>>, which is a CEFACT stereotype.

<<MA>>
No tags used.

The root class for the document is linked to the class that is used in the processes to represent the information that is exchanged and is stereotyped <<InfEnveloppe>>, which is a CEFACT stereotype.

<<InfEnvelope>>
No tags used.

10. Use of OCL-statements in UML-constraints in the ebIX® model

The way UML-constraints with OCL-statements are used in the ebIX® model is described in a separate document “ebIX® Rules for use of OCL constraints to tailor ABIE’s to Business Requirements”.