European Network of
Transmission System Operators
for Electricity

entsoe

EEMRM Methodology Description

Version 1.5

EEMRM SubGroup

23 January 2018

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Revision History

Version	Release	Date	Comments
1	0	2017-03-14	Initial release
1	1	2017-11-10	Update related to associations and colors used
1	2	2018-01-23	Update related to the direction of relationships
1	3	2018-03-21	Modifications following update from the EDI group
1	4	2018-04-10	Modifications following remarks from the EEMRM group Approved by MC

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3. Disclaimer

This is a draft document which purpose is to define the methodology used by WG EDI for documenting ENTSO-E work on modelling the electricity market. Any comment on this document is highly appreciated through the usual maintenance request process.

4. Objectives

This document was elaborated by the EEMRM (European Electricity Market Role Model) group, as a subgroup of the EDI (Electronic Data Interchange) Working Group.

The role of the EEMRM group is to extract a European electricity market role model based on the network codes and guidelines from regulation.

The purpose of this document is to establish the methodology to be applied for the translation of network codes, in order to set up a coherent model describing roles and processes in a consistent way.

If flaws are identified in the chosen methodology during the EEMRM development process, this document will be updated accordingly.

5. Modelling language

The modelling language chosen for the description of the EEMRM is the Archimate 2.0 language[1], which is an open and independent enterprise architecture modelling language, also used to draft the new IEC architecture reference.

This language allows for the description of several layers corresponding to different levels of detail: the business layer, the application layer, and the technology layer.

6. Level of detail of the description

Various types of processes can be described using Archimate, from the general business overview to the detail of the technology infrastructure used.

As a first step, the EEMRM will only be based on the processes defined in network codes and ENTSO-E guidelines. If the elements provided by these documents prove to be insufficient to get an exhaustive picture of the electricity market, the description of more specific local or regional implementation projects will be added to complete it.

Taking into consideration the first purpose of the EEMRM, which is the modelling of the high-level processes described in network codes and regulations, the model will only focus on the business layer metamodel.

[1] The use of the Archimate modelling language has been approved by the EDI Working Group during the physical meeting of the 2017-01-10.

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More specifically, it will describe the different roles identified in the network codes, the services provided by each role in the context of each process, and the business objects handled. Hence, only business elements from the Archimate model will be used.

The cardinality of elements should be added only if they are clearly defined in network codes and ENTSO-E guidelines.

7. Modelling elements used

6.1. Overview

The Archimate modelling language provides three types of elements which are to be used jointly to describe processes:

- **Active elements** are defined as entities that are capable of performing behaviour.
- **Behaviour elements** are defined as units of activity performed by one or more active elements.
- **Passive elements** are defined as objects on which behaviour is performed.

The business layer provided by Archimate 2.0 is provided in Figure 1. It describes all the classes that can be used to model business processes.

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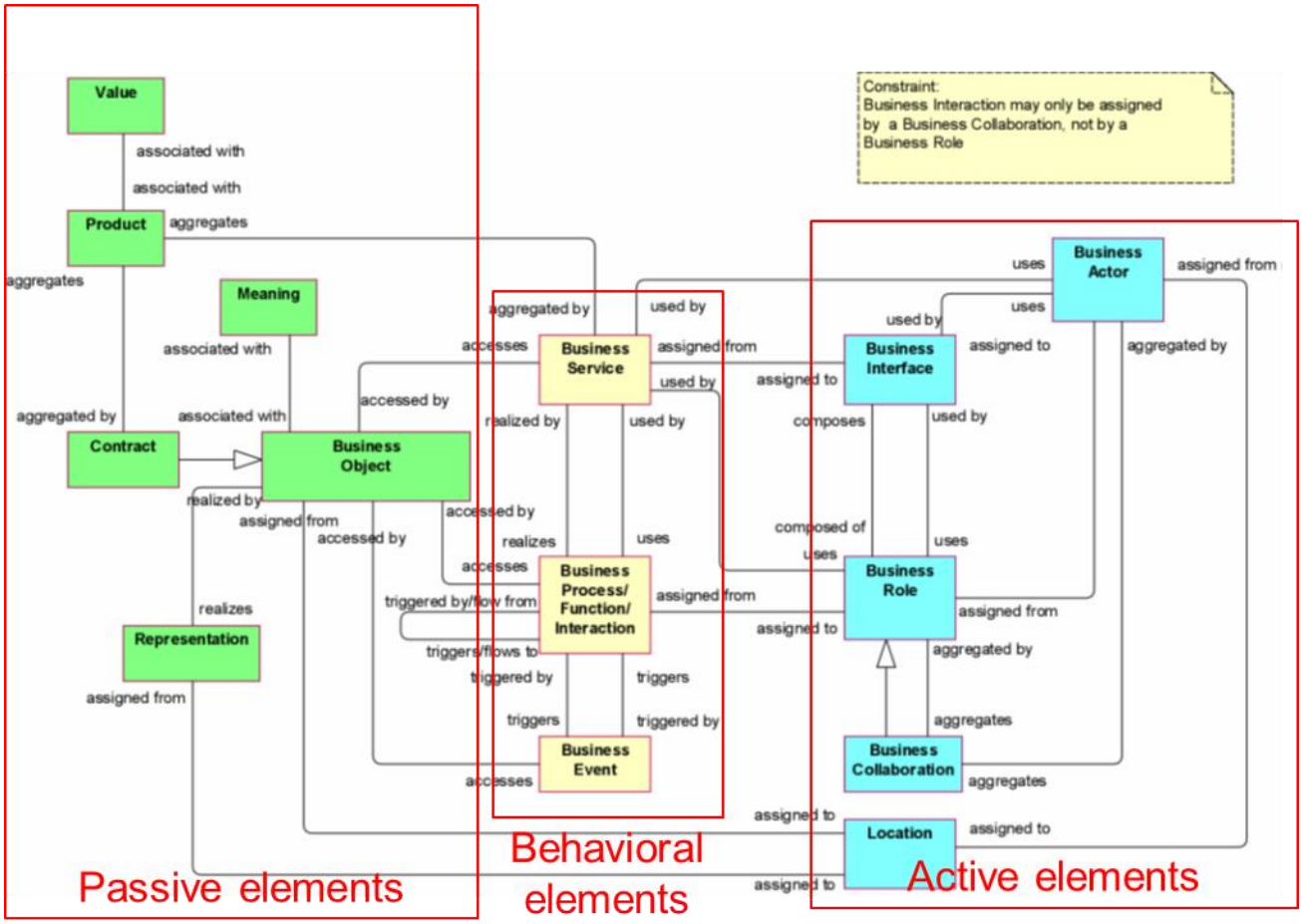

Figure 1: Business layer metamodel

Not all business classes are relevant for the description of the European electricity market. Hence, this chapter aims at describing the elements that will be used to model the EEMRM.

6.2. Active elements

Business role

The only active element which will be used is the Business role, represented in Figure 2, which is defined as the responsibility for performing specific behaviour.

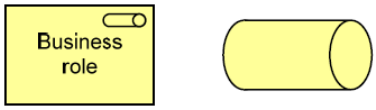

Figure 2: Business role notation

This generic class allows to cope with roles as they are defined in network codes, and will be sufficient for the description of active elements. More specifically, actors taking part in the electricity market will not be described, but the roles they fulfil in the various processes will be modelled.

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If, in one of the sources documents, a described role is always fulfilled by another role, then this sub-role will not be described separately.

Additionally, roles which are only involved in fallback processes will not be described in the EEMRM.

6.3. Behaviour elements

The purpose of the EEMRM is to define responsibilities assigned to the different roles described in network codes and guidelines from regulation. There is no information specifically concerning the processes allowing to fulfil these responsibilities in practice (e.g. timing considerations or sequences of events).

Two classes will be used to describe behaviours performed by active elements.

Business service

The main class used for the modelling of behaviours is the Business service, represented in Figure 3, which is defined as a service that fulfills a business need for a customer.

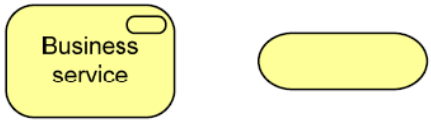

Figure 3: Business service notation

This class is a generic element which will describe the services fulfilled by business roles, and used by other business roles.

6.4. Passive elements

Business object

The only necessary passive element is the Business object, represented in Figure 4, which is defined as a passive element that has relevance from a business perspective.

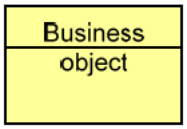

Figure 4: Business object notation

For the modelling of the electricity market from a business perspective, it is not necessary to describe objects too specifically. Hence, this element allows to describe generic business objects handled by behaviour elements.

6.5. Colors used

Colors are for information purpose only.

The main source of the EEMRM model will be network codes. However, in some cases, additional information might be retrieved from other sources (e.g. other models).

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Elements (classes or associations) coming from other sources will be identified, and a specific colour will be used for each source. A legend will be created to match colours and the associated sources.

8. Relationship elements used

Relationship elements also have to be defined in order to link classes and to model the interactions between active elements, behaviours, and passive elements.

For the development of the EEMRM model, the relationships[2] listed in Table 1 will be used.

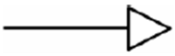
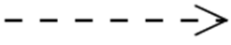
Relationship	Description	Notation	Comments
Association	Association models a relationship between objects that is not covered by another, more specific relationship.		This will be used to describe generic relationships.
Access	The access relationship models the access of behavioral concepts to business or data objects.		This will be used to describe how behavioural elements access passive elements.
Used by	The used by relationship models the use of services by processes, functions, or interactions and the access to interfaces by roles, components, or collaborations.		This will be used to describe how active elements use services provided by other active elements.
Assignment	The assignment relationship links units of behavior with active elements (e.g., roles, components) that perform them, or roles with actors that fulfill them.		This will be used to link active elements with the behaviours they perform.
Composition	The composition relationship indicates that an object is composed of one or more other objects.		This will be used to describe the composition of business objects, e.g. areas
Triggering	The triggering relationship describes the temporal or causal relationships between processes, functions, interactions, and events.		This will be used to describe events that trigger behaviours.
Junction	A junction is used to connect relationships of the same type.		This will be used to connect similar relationships.
Specialization	The specialization relationship indicates that an object is a specialization of another object.		This will be used o define specializations of an active or a passibe element.
Dependency	A Dependency is a relationship that shows that an element, or set of elements, requires other model elements for their specification or implementation.		Generic relationship used in detailed views.

Table 1: List of relationships used

In detailed views representing the responsibilities for a give role, in order not to overload the model with too much information, only the generic "dependency" relationship will be used.

[2] The relationships used by Archimate are the relationships developed in the UML modelling language.

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When the dependency relationship is used, the conventions used for the direction of the corresponding arrows is described in Figure 5.

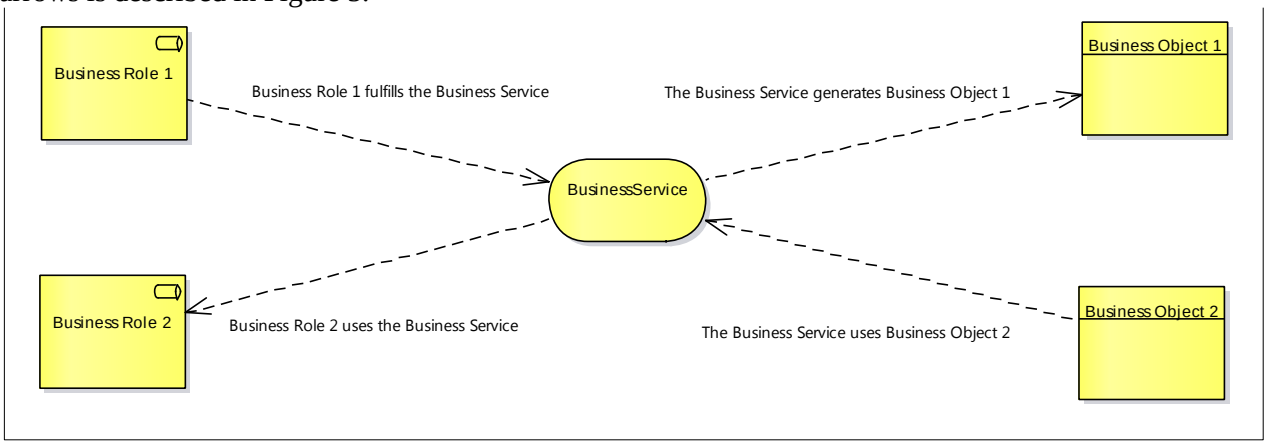

Figure 5: Direction conventions for the dependency relationship

9. Modelling example

A very simple example showing the interactions between the Archimate classes using relationships is shown in Figure 6.

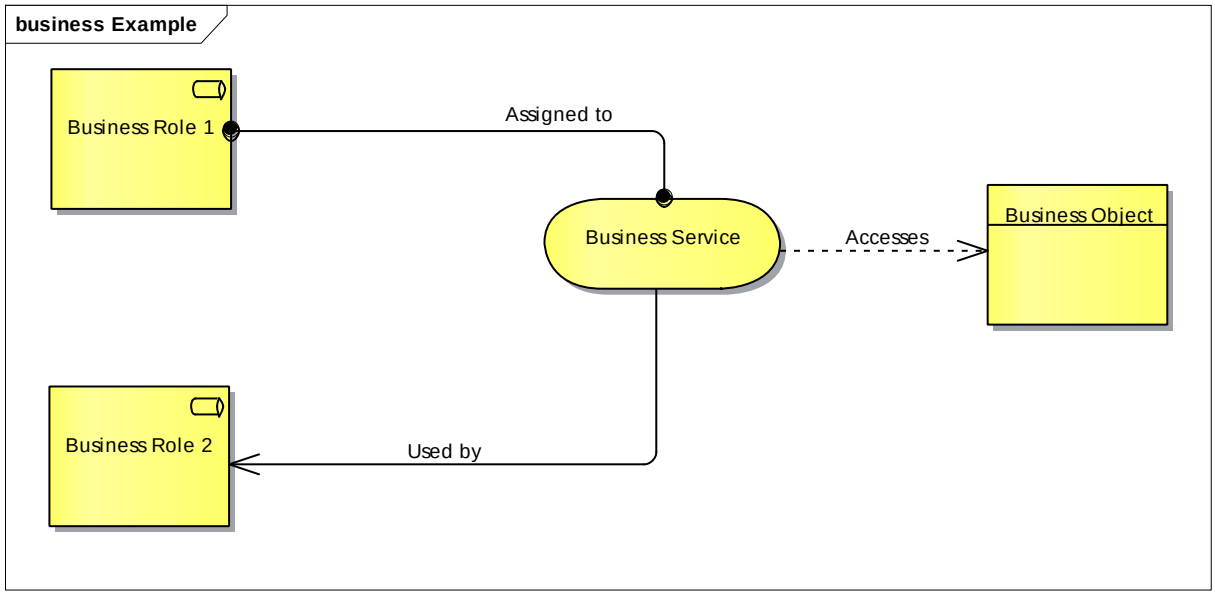

Figure 6: Modelling example

In this example, a role called “Business Role 1” provides a Business Service used by “Business Role 2”. This Business Service accesses a Business Object.

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10. Annex 1: Colors used in the EEMRM

The sources of the information contained in the EEMRM model, as well as the associated colours, are presented in Table 2.

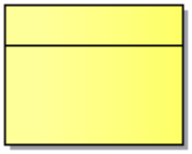
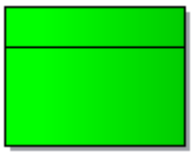
Color used	Corresponding source
	CACM Network code
	Market Integration Working Group model

Table 2: Colours used and corresponding sources

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