An Add-In for UN/CEFACT's Modeling Methodology 2.0

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ABSTRACT
UN/CEFACT's Modeling Methodology (UMM) is a UML based
modeling language and has become the method of choice for the
modeling of inter-organizational business processes. The complex-
ity of UMM, however, makes it difficult to use for novice modelers.
In order to overcome this limitation and to allow for a seamless
integration of UMM into any UML modeling tool of choice, we
have developed the UMM Add-In. The UMM Add-In builds upon
the UML modeling tool Enterprise Architect [5] and assists a busi-
ness modeler in creating a valid UMM model. Thereby the Add-In
consists of a UMM specific tool bar, a quick link feature, and a
UMM validator. Using our UMM Add-In even an inexperienced
business modeler can quickly create inter-organizational business
process models.

1. INTRODUCTION
In recent years collaborative business process modeling has be-
come more and more popular. Inter-organizational collaborations
have to be maintained and understood among all participating busi-
ness partners and involved stakeholders. The United Nation's Cen-
ter for Trade Facilitation and Electronic Business (UN/CEFACT)
took up the challenge and started to develop a methodological mod-
eling approach resulting in UN/CEFACT's Modeling Methodology
(UMM) [7]. UMM allows the business modeler to model inter-
organizational processes independent of the underlying implemen-
tation technology - e.g. Web Services or ebXML - following the
open-edi standard [3]. The concepts of UMM are realized as a
UML profile. UML profiles enable the customization of the popu-
lar Unified Modeling Language (UML) [4] and allow to shape the
UML to the specific needs of e.g. collaborative B2B.

UMM is a broad approach and therefore holds a high grade of com-
plexity. Hence, the implementation of UMM business models is
a challenging task, especially for novice users. In order to foster
a better understanding of UMM we have developed a tool called
UMM Add-In, supporting the business modeler in creating valid
UMM models. Since the theoretical concepts of UMM are realized
as a ready-to-use tool, they are easier to perceive for inexperienced
modelers. Our current UMM Add-In implementation supports the

UMM 2.0 specification [7]. In the following we highlight the most
important features and concepts.

2. UN/CEFACT'S MODELING METHODOL-OGY
UN/CEFACT's Modeling Methodology (UMM) is defined as a UML
profile on top of the UML 2.0 meta model. Using stereotypes,
tagged values and OCL constraints the UML meta model is tailored
to the specific needs of inter-organizational business process mod-
eling. UMM comprises three distinctive views namely *business
requirements view* (BRV), *business choreography view* (BCV), and
business information view (BIV). Within the *business requirements
view* the specific requirements of the business process are captured.
Using these requirements the modeler completes the formal rep-
resentation of the business process in the *business choreography
view*. The business documents exchanged in an inter-organizational
business process are modeled in the *business information view*.

A UMM model defines an inter-organizational business process
from a global perspective and defines a so called business chore-
ography. A business choreography then serves as a template for
the participating business partners in order to successfully config-
ure their local IT systems. If each business partner defines his own
IT configuration without adhering to a global choreography, the re-
sulting IT system configurations are unlikely to match.

Currently there are two versions of UMM available. UMM 1.0 [6]
has already been released as a final specification. The most recent
version of UMM is UMM 2.0, being currently under development.
The new version of UMM has several enhancements facilitating its
use in comparison to the prior version.

3. THE UMM ADD-IN 2.0
The UMM Add-In is realized on top of the UML modeling tool
Enterprise Architect. Using the API of Enterprise Architect the dif-
ferent features of the Add-In are realized and programmed in .NET
C#. The UMM Add-In 2.0 offers three main features: firstly, the
UMM specific toolbar integrates the UML profile into Enterprise
Architect, secondly, personalized quick links ease the development
of UMM models, and finally, a UMM Validator checks the model
for UMM 2.0 compliance.

3.1 Profile integration
In order to use all the UMM stereotypes defined in the UML profile,
it is necessary to integrate these stereotypes into Enterprise Archi-
tect. Instead of defining each UMM element by hand, it is more
convenient to provide the modeler with a set of predefined model-
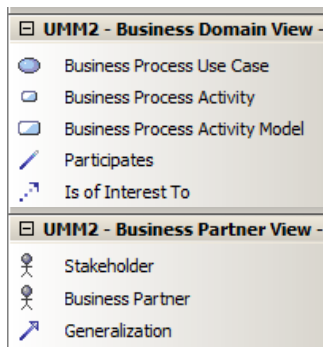ing elements, according to the UMM specification. In Enterprise
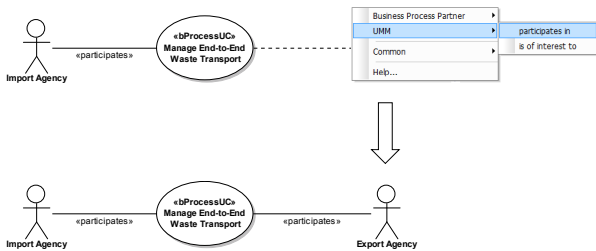
Figure 1: Screenshot of the UML profile

Figure 2: Screenshot of the *Quick Link* functionality.

Architect the UML profile for UN/CEFACT's Modeling Methodology is presented to the modeler as a dedicated tool-bar. Using the predefined elements from the tool-bar, the modeler can simply drag and drop elements onto the modeling canvas.

Figure 1 shows a cut-out from the UMM specific toolbar within Enterprise Architect. For each view and sub-view in UMM a dedicated compartment in the UMM toolbar is created. On top of figure 1 the relevant artifacts for the *business domain view* are shown and at the bottom those for the *business partner view*. Please note, that due to space limitations not all artifacts are shown in figure 1.

The integration of the UML profile as a specific toolbar is not limited to the UML modeling tool Enterprise Architect. In general the UML profile can be imported into any UML modeling tool of choice, providing the business process modeler with the correct artifacts for each view.

3.2 Personalized Quick Links

In order to ease the development of UMM models the UMM Add-In supports the concept of *Quick Links*. Instead of adding new elements and relations by hand, *Quick Links* enable the modeler to create and allocate elements automatically. Additionally a restricted list of valid connection types can be provided depending on the specific context. Figure 2 depicts the business process use-case *Manage End-to-End Waste Transport* and its related business partners. As shown on top of figure 2 the modeler may use a context specific menu in order to add a new business partner to the use case. The new business partner is automatically added to the model and the appropriate connection stereotype is set (*participates*). The quick link functionality of the UMM Add-In in particular aids inexperienced users since only valid connection types and elements are proposed by the *Quick Linker*.

3.3 UMM Validator

As outlined before, the UMM is defined as a profile on top of the UML 2.0 meta model. Using OCL constraints, tagged values and stereotypes the UML is customized for the specific purpose of business process modeling. Thereby the UMM specification [7] specifically defines the relationships between the different modeling artifacts, which elements are allowed in which view, etc. A UMM model is valid, only in case it does not violate any of the constrainst specified in the specification. However, since the UMM specification holds a multitude of different constraints it is very difficult especially for an inexperienced user to follow them all.

During the modeling process, artifacts are created in an iterative manner and often errors occur. The UMM Add-In provides a UMM validator checking the constraints specified in the specification against any given UMM model. In case of factual errors in the model the user is provided with detailed error messages helping to correct the model. In prior publications we have already shown, that a UMM model may also be used to derive deployment artifacts for a service oriented architecture [1] [2]. However, in order to allow for such a derivation mechanism a valid UMM model is a crucial prerequisite, otherwise a derivation algorithm will either fail or generate invalid code.

3.4 Conclusion and Outlook

In this paper we have shown how the UMM Add-In supports a business modeler in creating valid UMM models. Thereby the theoretical concepts of UMM, which are hard to conceive for an inexperienced modeler, are realized using a tool support. For the future several extensions of the UMM Add-In are planned. First, the integration of the business document perspective into the UMM Add-In will be of importance. Similar to the concept of UMM and the business process perspective, UN/CEFACT develops a UML profile for the modeling of business documents called UPCC (UML Profile for Core Components). The concepts of the UPCC will also be integrated into the UMM Add-In. Second, the generation of deployment artifacts for service oriented architectures out of UMM models is planned for the future. Finally the development of a registry connector allowing the storage and retrieval from a model repository is planned for the future.

4. REFERENCES

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