

Business Process Definition Metamodel

B. D.

May 24, 2021

1 Abstract

To be able to manage a process within an organization it is necessary to be able to describe the process in an unambiguous way. This enables the comparison of different processes without actually implementing them. This in turn is necessary to distinguish between desirable and undesirable modifications to this process. Different metamodels are applicable like Petri Nets, UML-activity diagrams or event-driven process chain charts. One of the more common metamodels used for this application are BPMN models. To enable automated translation from one metamodel into another and improve cross-organizational communication about business processes the Business Process Definition Metamodel (BPDM) was created. The idea behind BPDM is to define a very extensive set of concepts so that other modeling tools can easily be implemented in a compatible way by providing mappings from their own modeling language to the concepts of BPDM.

2 Metamodel

A metamodel defines the framework for modeling systems on a schematic level. A central part of a metamodel is its language that is used to define models. The modeling language contains the objects used to create models as well as it includes their syntax and semantics. Also part of the metamodel are the representations of the resulting models including graphic-representations and file-format representations. The third component of a metamodel is the modeling procedure used in the creation of models [7].

The choice of the metamodel used for creating a model defines what information is incorporated into the model as well as how this information is understood. Although in the best case no additional information but the metamodel is needed to understand a model in reality almost always additional domain-specific knowledge is necessary.

3 Business Process

"A business process consists of a sequence of coordinated activities. These are either tasks or subprocesses. Tasks are always atomic, i.e. they are not further detailed in the context of a process definition." [2, p. 1]. It is important to distinguish between a process and a process-instance [5]. A business process is the general concept of a sequence of activities

(for example 'appointment scheduling') while an instance of a business process describes an actually occurring event (for example 'Ms. X calls and books an appointment for Friday 1st of January') [7].

4 Business Process Model and Notation (BPMN)

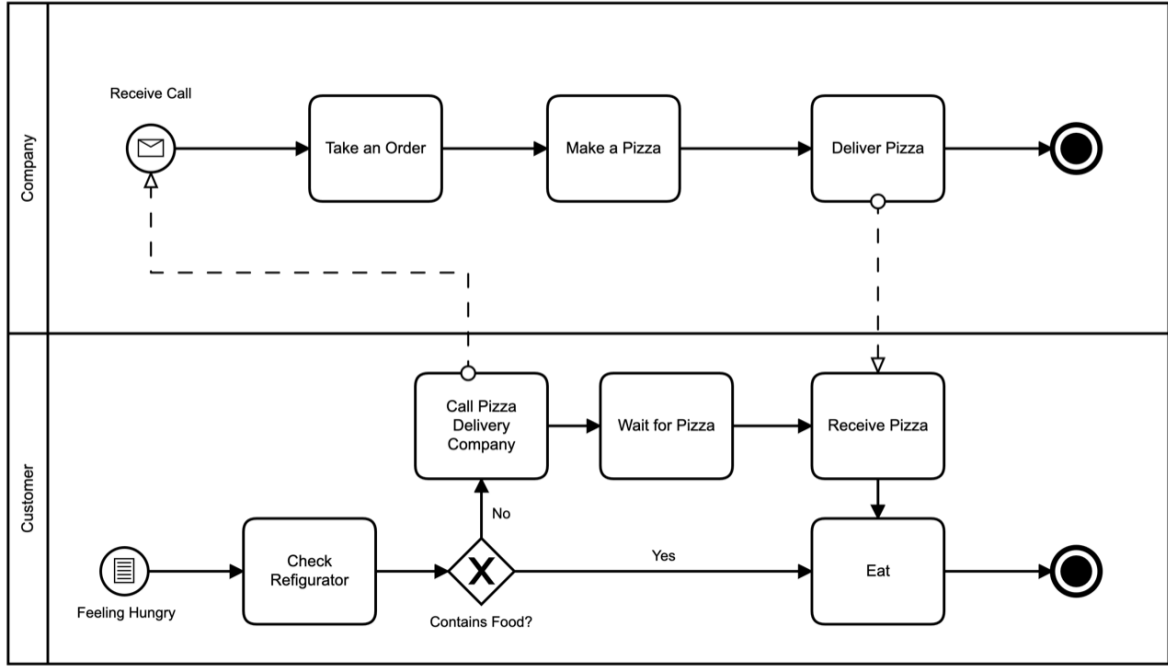


Figure 1: Example BPMN model for the process of ordering a pizza.

BPMN is a metamodel used to describe business processes. In its original version published in 2007 it was only a graphical notation not a full metamodel as the definition was rather informal and focused mainly on the visual elements not on the underlying semantics. These gaps were closed with the release of the BPMN 2.0 specification in 2011 by providing more detailed information on the semantics of model elements as well as standardized data-format for BPMN-models based on the XML format. The BPMN 2.0.1 specification was promoted into an ISO standard in 2013 [3].

5 Business Process Definition Metamodel (BPDM)

The Business Process Metamodel consists of an extensive set of concepts in the form of language elements. Although this concepts can be used to describe business processes BPDM does not provide the modeling language to do so. The fundamental idea is to provide a unified vocabulary for other tools and modeling languages. When implementing such a modeling language one would define a so called 'mapping' between the created model and BPDM. This

enables translation between different models without changing the meaning of the portrayed system. Also this would enable platform independence for models as different software vendors could provide a mapping between their data-format and BPDM [6].

BPDM consists of different components that focus on different aspects: the condition model, the composition model and the course model. The *condition model* defines different ways to represent boolean expressions and their relation to the real world. The *composition model* describes concepts that can be used to describe the relation of entities in the real world. The *course model* contains the concepts to incorporate dynamic behavior into the models like events and changes over time [4]. The BPDM definition does not stay completely true to its motivation of being a metamodel independent of modeling languages but does include some references to BPMN.

6 Relevance of BPDM

Both BPDM and BPMN are maintained by the Object Management Group (OMG). OMG does also maintain the UML standard. When the original version of BPMN was published in 2004 it was developed within the Business Process Management Initiative that in 2005 merged with OMG under the OMG name. In 2006 OMG released the official BPMN 1.0 standard which did not include a full metamodel. One year later the vice-president of the OMG organization Jon Siegel stated that OMG was working on BPDM to provide a metamodel not only for BPMN but also for all other business process models although BPMN was specifically considered when designing BPDM. Also BPMN 2.0 was meant to integrate into BPDM by providing a corresponding mapping and using BPDM terminology [6]. The BPDM specification was published in its final form in 2008. Three years later in 2011 BPMN 2.0 was released. But instead of building on BPDM as a metamodel it defines its own metamodel.

In conclusion it is clear that BPDM was mainly created to provide a metamodel to the already existing BPMN while also providing compatibility to other modeling languages [1]. To archive this the metamodel had to be more complex than otherwise necessary if it would only support BPMN and other models had to adopt the BPDM. Today there is no wide variety of modeling languages that adopted BPDM.

References

- [1] Jordi Cabot. Has the success of BPMN 2.0 killed BPDM.
<https://modeling-languages.com/has-success-bpmn-20-killed-bpdm-business-process-definition-metamodel/>, November 2010.
- [2] Jochen Göpfert, Heidi Lindenbach. *Geschäftsprozessmodellierung mit BPMN 2.0*. Oldenbourg Wissenschaftsverlag, 2013.
- [3] ISO/IEC Information Technology Task Force. ISO/IEC 19510:2013, 07/2013.
- [4] Object Management Group. *Business Process Definition MetaModel*. Volume 1, 2008.

- [5] Object Management Group. Business Process Model and Notation (BPMN) Version 2.0, January 2011.
- [6] Jon Siegel. BPDM: Die OMG-Spezifikationen zur Geschäftsprozessmodellierung. *OBJEKTSpektrum*, 2007.
- [7] Alfred Winter. Vorlesung: Architektur von Informationssystemen im Gesundheitswesen. Uni Leipzig, 2020.