Identification of an Appropriate Modelling Method for the Value Reference Model

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Abstract. The focus of this paper is towards identification of an appropriate Modelling Method for the Value Reference Model. In order to address such challenge, paper first outlines a brief use case description to identify the object under observation and to define the actual purpose of modelling. Second, an application of the Generic Modelling Method Specification framework is outlined and applied for the specification of the modelling method in question according to works by Karagiannis and Kühn. And, third questions that should be answered before selection of the appropriate modelling methods are identified, based on the introduction of VRM and SCOR conceptual frameworks, comprising the actual conceptual skeleton of the appropriate modelling method.

Keywords: Value Reference Model, Supply Chain Operations Reference-Model, Modelling Method, Meta Models

1 The Goal of Model based Approach

The goal of this short paper is to identify the pre-requisites necessary for selection of an appropriate Modelling Method for the Value Reference Model (VRM) [1]. In a first step the object of observation and the purpose of modelling is identified based on the requirements imposed by the selected use cases and applicable Model-based approaches. Second the Generic Modelling Method Framework Specification [2] is briefly introduced in order to cover the conceptual aspects. Finally the research approach is introduced that aims to find the appropriate modelling method for the VRM.

1.1 Use Cases as Object under Observation

We have selected following use cases to serve as possible Objects of Observations:
(1) Retail Industry in Lithuania: high number of SME's is involved in the retail industry of Lithuania. Most of these SME's cannot afford large investments in individualized IT systems. They need e-business systems, which use either open source or affordable technologies and also open information exchange standards in order to enable better organization, optimization and risk management. [3].
(2) Agro-food Industry in Turkey: Agriculture sector in Turkey is currently too slow on adapting to changes in the markets affected by globalization. The investment in the

e-business and application of agreed information exchange standards could result in an approach allowing activity-based cost, optimisation and risk management, thus raising the adaptivity level toward external/internal changes [3].
(3) Furniture Industry in Spain: Aidima[4] is engaged with high quality technological developments and provisioning of innovation services for the Furniture Industry in Spain. Their activities require, application of a collaborative-based platform providing support in the process acquiring information regarding AS-IS scenarios in production, supply chain and customer relations, and support idea management. This platform should be capable of allowing redesign of the supply chain based on innovations [4].
(4) Mechanical Engineering Industry in Italy: Loccioni is researching, designing and developing innovative customized solutions and systems for the improvement of quality. These activities require support by a collaboration platform that is capable of managing (acquiring) the information coming from production, supply chain and customer relations and in a subsequent step the processed information is returned in order to improve the processes [4].
(5) Textile Industry in Italy: Cashmere production via cross-sector workflow. In order to raise the sustainability level against the risks within the supply chain, the stockholders in this workflow need collaboration tool that collects information from whole supply chain and enables interoperability for exchange of documents [6].

1.2 Purpose of Modelling

After considering the stakeholders requirements from the use-cases, the purpose of modelling of the aforementioned object of observation can be one of the following:
(1) Strategic management, (2) Performance management, (3) Programme and initiative management, (4) Business Process and Supply Chain Management; (5) Process analysis and optimisation, (6) Process performance management, (7) Quality and information management, (8) Governance, risk management, compliance, (9) Implementation of business process in IT systems, (10) Supply Chain management (11) IT Architecture and Service Management; (12) IT Governance, (13) Enterprise architecture management, (14) IT service management.

2 Specification of Modelling Methods

The Generic Modelling Method Specification Framework - GMMSF (depicted in Fig.1) classifies each modelling method in (a) a modelling technique part and (b) a functional part considering mechanisms and algorithms. Hence this GMMSF shares the vision on mechanisms and algorithm applied on models. This viewpoint defines models as objects on which functions are applied on. Similar to a construction plan, that is used to apply static calculations on, which are further used. Hence the static calculations are mechanisms applied on the construction plan – which is seen as a model. The model is therefore not only for documentation purpose, but concrete functions are applied on models that could not be performed without a model.

The modelling technique considers the modelling language and the corresponding sequence of necessary steps to create a model. This sequence of necessary steps is called modelling procedure, whereas each step of the modelling procedure requires a different part of the modelling language. Similar to construction plan, the available modelling concepts are different depending on the status of the planning phase. Hence different models have different pre-conditions, e.g. that business models are specified before business rules can be defined, or location diagrams of stocks are specified before logistic processes can be defined.

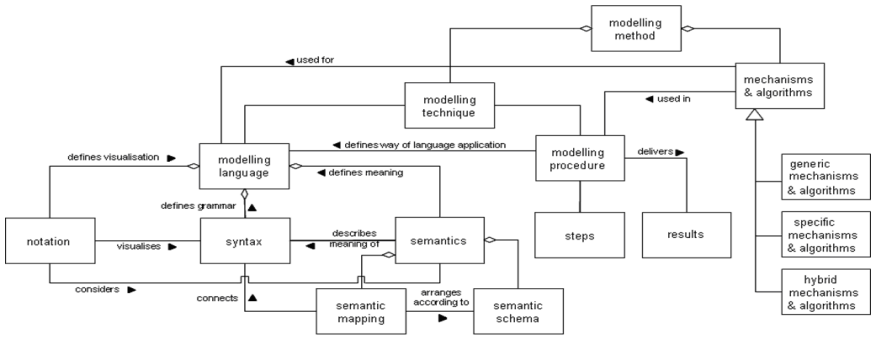

Fig. 1. Generic Modelling Method Specification Framework, source [2]

3 How to find the appropriate Modelling Method

This section raises the research question on the identification of the appropriate modelling method for the VRM.

3.1 Conceptual Framework

First both frameworks (1) VRM and (2) SCOR are used to define the conceptual skeleton for appropriate modelling methods. Fig. 2 introduces on a very high level the two conceptual frameworks.

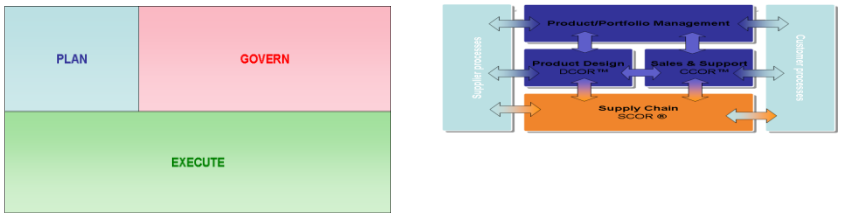

Fig. 2. Mapping Model based scenarios to existing Supply Chain Management Frameworks [7,8]

3.2 Identified Dimensions of Modelling Methods

Before identifying the appropriate modelling method a set of questions need to be considered: What is the domain? What is the purpose of modelling? What is the object of observation? Which properties are reduced for simplification? What nature is the object of observation? What is the appropriate level of detail? What is the appropriate s semantic expressiveness? How does the model evolve? How is it maintained? Who and how is interpreting the model? What is the underlying formalism of the object of observation? Which level of abstraction is appropriate? What kind of thinking paradigm is used?

Answers to these questions may vary from scenario to scenario and are defined based on the end user requirements, market demands, conceptual philosophies and technical applicability.

4 Applied Research Approach and Conclusion

This short paper provided a brief introduction on the problem of selecting the appropriate modelling method for a specific scenario – in this application, the VRM and SCOR. Currently this complex process is under research in [4] and the focus is towards applying a pragmatic scrum like research method to enact creative sprints based on brain-storming, end user feedback, literature input, and input from the existing tools. In the consideration phase, the new ideas are specified in correct model types, model artefacts, semantic expression, notations, modelling stacks and functional requirements and are realized in a series of prototypes. .

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