Chapter VI

Using a Model Quality Framework for Requirements Specification of an Enterprise Modeling Language

John Krogstie, SINTEF ICT and IDI, NTNU, Norway
Vibeke Dalberg, DNV, Norway
Siri Moe Jensen, DNV, Norway

ABSTRACT

As more and more modern modeling tools provide the possibility of developing specialized and new modeling languages (also called meta modeling or method engineering), the need for methodologies and guidelines to perform requirements specification in the development and evolution of these languages increases. Based on work on quality of models and modeling languages, we have defined a methodology to attack this problem, taking as an outset the goals of modeling, modeling tasks, and related roles involved in model development and model interpretation. This chapter presents the application of this methodology for selection and refinement of a modeling language for a process harmonization project in an international organization. The harmonization project uses process models...
as the basis for developing a support environment for the new harmonized process. The process models were used for many different tasks, and it proved to be very beneficial to structure the modeling language requirements specification process to be able to prioritize what was to be implemented in the specialized language.

INTRODUCTION

Whereas a lot of work has been done on abstractly defining new modeling languages, going back to the 1970s with DFD and ER-modeling, relatively little work is reported on methodologies for developing modeling languages to be used in a specific organizational setting. Although meta-modeling tools and approaches have been available for a number of years, it is first over the last five years tools and approaches making meta modeling comparatively easy to do have appeared. This supports a shift of focus from technical implementation of the tool support for the modeling language to specifying the requirements to the new modeling language. On the one side, within UML, extension mechanisms have been defined within the language itself, starting with profiles in UML 1.X (OMG, 2001), and many UML tools provide these possibilities to their developers. Full meta modeling has been made available in tools for domain specific modeling (DSM), such as MetaEdit (Kelly & Tolvanen, 2001) and enterprise modeling, such as METIS (Lillehagen, 1999).

Based on Curtis, Kellner, and Over (1992) and Vernadat (1996) enterprise models, including enterprise process models can be said to be usefully utilized in the following different areas:

1. Human sense making and communication: The main purpose of modeling is to make sense of aspects of an enterprise and communicate with other people.
2. Computer-assisted analysis: The main purpose of modeling is to gain knowledge about the enterprise through simulation or deduction.
3. Model deployment and activation: The main purpose of modeling is to integrate the model in an information system and thereby actively take part in the work performed by the organization. Models can be activated in three ways:

   - **Through people** guided by process “maps”, where the system offers no active support or enforcement;
   - **Automatically**, where the system plays an active role in enforcing the “script”, as in most workflow engines; and
   - **Interactively**, where the computer and the users cooperate in interpreting the model in the situations that arise.