

Chapter 20

Modeling for Tools and Environments Specification

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ABSTRACT

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 - From the Model to the PALOMA Tool
- Modeling a Resource Repository Management Process
 - The Main Q4R Process
 - Analysis of Organizational Needs
 - Elaboration of the Q4R KIT
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This chapter presents a series of projects where the MOT modeling technique was used to specify some software tools, systems or Web-based environments. These activities are similar to those where a software engineer uses visual languages such as UML to specify a tool or a system. The main difference here is that MOT can be used by

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designers who are not necessarily software engineers, as we have pointed out when introducing this representation language in Chapter 2.

As we have also underlined in Chapter 14 on Ontology Engineering, except in simple cases, semi-formal models in MOT+ will have to be transformed in an ontology-based language like OWL-DL, or in software engineering specifications using UML before the tool or system is built. It is also possible, as we will show in the last example of this chapter, that designers can be trained to put their conceptual models already in OWL-DL format using the MOT+OWL or the MOWL ontology modeling tools presented in Chapter 10, leaving the task to computer specialists to integrate later in the ontology the technical elements needed to implement the system.

The following applications are in two groups. In the first three sections, we will see that conceptual designers have used the basic MOT language to build semi-formal process models where the actors are involved in using a tool that they want to see constructed: a learning object repository manager (PALOMA) in the first case, a quality for reuse (Q4R) tool kit in the second case, and a competency self assessment tool (COMPETENCE+) in the third case. In the last section, we will present how the MOT+OWL has been used to build an ontology-driven environment like PONCELET, which serves to teach projective geometry.

20.1 MODELING LEARNING RESOURCE MANAGEMENT TOOLS¹

The models in this section, designed and produced by the LICEF Team, include models defining various functions of a Learning Resource Manager (LRM). A LRM inspired by these models was first included into the Explor@ Learning Management System (Paquette, Miara, Lundgren-Cayrol & Guérette, 2004) for online teaching and learning. Later on, it evolved to an autonomous tool that is widely used called PALOMA. The LRM

was planned to manage all kinds of resources involved in online learning, including learning events, documents for both learners and teachers, tools and services.

It is important to point out that this modeling experience was carried out before the IMS Learning Object Metadata specification became a standard and that all implications for sharing online resources were not known. The LRM developed here aimed at an institutional resources sharing by professors, tutors and instructional designers.

Model Description

Resource management is a multi-actor process where users find interesting resources and describe them using an electronic metadata template. Other roles interact within this process, for example to add or retrieve resources and to reference resources with metadata according to some standard. The set of metadata templates constitutes the repository.

An LRM allows users to search and retrieve resources in different manners (free search, search by specific metadata, thesaurus, etc...). Users are also encouraged to annotate each resource to improve and maintain quality of both resources and the repository itself. It is essential for all actors in online learning to have access to a learning resource repository and an easy to fill-in template to supply metadata, which serves to describe each resource. These constitute information that facilitates search and retrieval.

The model was built with the objective to convey design ideas from the Pedagogical Research Team to the software developers that were to build the LRM. Figure 1 presents the main user process, called “Request Search” for resources and the resulting activities, depending upon whether the result is satisfactory or not. If, satisfactory, three activities are possible and if not, two other activities are suggested.

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