Transforming the OOram Three-Model Architecture into a UML-Based Process[1]

Jesús García Molina, M. José Ortín, Begoña Moros, Joaquín Nicolás, Ambrosio Toval
Software Engineering Research Group. Departamento de Informática y Sistemas.
Facultad de Informática. Universidad de Murcia. Spain.
Phone: +34 968 36 46 10; fax: +34 968 36 41 51
{molina, mjortin, bmoros, jnr, atoval}@um.es

Abstract

Three-model architecture (TMA) is a software process defined for the OOram method, and aimed at developing business information systems. In our experience, TMA is very helpful in building client-server applications using object-oriented and database technology. However, in order to use a standard notation and to take full advantage of the benefits provided by use case-driven processes, it is convenient to transfer TMA to UML. In this paper, we present the translation of TMA into a UML-based process. The enterprise, information and task models of TMA are translated into UML models while preserving their original purpose. An important benefit of the process obtained is to provide guidelines for the elicitation of use cases and domain classes from the enterprise model.

1. Introduction

OOram [15] is a method, based on the concept of role, for performing object-oriented modeling. *Three-model architecture* (TMA hereinafter) [16] is a process defined to support the analysis of information systems by means of OOram. Three years ago, we used this process for modeling a workflow information system in a project aimed at developing the workflow tax system for the Regional Information Systems and Telecommunications Office in the Regional Government [12]. This experience made us to realize that TMA is very suitable for developing business applications involving object-oriented and database technology in a client-server architecture. In addition, we improved TMA by using techniques drawn from the IDEA method [2] to undertake the database design. Furthermore, we realized later the usefulness of using UML [1], instead of the techniques of OOram and IDEA, since UML is the OMG standard language for object-oriented modeling.

Thus, in this paper we describe how to translate TMA into a use case-driven UML-based process, by showing the mapping from the OOram concepts into those of UML, and the way of expressing the OOram models through UML diagrams.

It is important to remark that we do not deal with the problem of expressing the role concept of OOram in UML. This problem was addressed in a previous paper [13], which was presented prior to the interesting discussion on this matter, which is still open in the UML RTF forum [11]. Moreover, role modeling is not essential in the underlying techniques of TMA.

This paper is structured in the following way: TMA process is briefly described in section 2; sections 3, 4 and 5 deal with the mapping from each model of TMA into UML. Finally, in section 6 we set out our conclusions.

2. The three-model architecture of OOram

Three-model architecture [16] is a software process based on the building of three models: *Enterprise Model, Information Model* and *Tool Model*. The first is used for identifying the roles that are played by the workers in the organization, and how they collaborate in order to fulfill the business tasks. The second model describes the information managed by the enterprise. The third model shows the interfaces between the users and the services which provide access to the information (to databases), that is, the software tools used by users in order to perform their tasks by accessing the information services. Figure 1 (extracted from [16]) shows the relationships between the three models. We can see that tasks and business information are provided by the enterprise model, and the

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