Chapter VII

A Language-Action Approach to the Design of UML Models

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ABSTRACT

The language-action perspective provides a communicative view on the organization. In it, an organization is characterized as a system of interacting agents. This view is helpful in understanding how the organization works, and it can also contribute to the design of information systems in support of it. This design is often done in UML, a language that views an information system as a system of message-passing objects. We suggest an approach to support this design by mapping action models onto UML models.
INTRODUCTION

In a reengineering project, it is not uncommon to encounter a situation where none of the available modeling methods can complete the whole task. We met such a situation in an interorganizational project where we used one such approach, the language-action perspective, to analyze the business process. This approach was useful for understanding the business situation, eliciting problems, and proposing the design of an improved organization. But some of the problems consisted of poor or missing information system support, and we considered that UML would be more useful for finding solutions to them. That left us with the task of “implementing” our organizational designs, which we developed in DEMO, in a new language, UML, a task that was by no means straightforward owing to the fact that both languages represent different views on a system (the following paragraphs elaborate this point). As a consequence, we developed a language-mapping framework to support this task. In the remaining sections, we introduce the languages involved, develop the mapping procedure, and relate empirical findings regarding this approach.

In his paper “Representation and Communication,” Johannesson (1995, p. 291) writes: “There are several different views of the functional role of information systems. Two of the most important ones are the model view and the communicative action view. According to the model view, the primary purpose of an information system is to provide a model of a universe of discourse (UoD), thereby enabling people to obtain information about reality by studying the model. In this respect, an information system works as a passive repository of data that reflects the structure and behaviour of the UoD. In contrast, the communicative action view states that the major role of an information system is to support communication within an organisation by structuring and coordinating the actions performed by the organisation’s agents. The system is seen as a medium through which people can perform social actions, such as stating facts, making promises, and giving orders.”

He reconciles both views by suggesting a language that is similar to the data-flow diagrams of the model view, but which is founded on the speech acts of the communicative action view. The choice of terminology for the two views is unfortunate, though. On the one hand, proponents of the action view also employ models to picture the system in question (typically an organization). On the other hand, languages that provide a model view often define a concept of action. But the two views are based on ontological foundations that are so fundamentally different that the two concepts of “action” have little in common. The following paragraphs explore this issue.

Figure 1. Action view and reaction view

A: Agent
- Action pair
O: Object
-> Message
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