

Chapter 8

Modeling Multi-Actor Activity Scenarios

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ABSTRACT

- Instructional Engineering and Learning Scenarios
 - The MISA Method
 - Process-based delivery scenarios
 - Process-based learning scenarios
- Multi-actor Processes and Workflows
 - Workflow models
 - The Business Process Modeling Notation (BPMN)
 - Basic Elements
 - Control workflow patterns
 - Patterns for personalization
 - Learnflows vs. workflows

- The MOT+LD and the TELOS Scenario Editors
- A Scenario Modeling Process

In this chapter, we concentrate on a very interesting type of model: multi-actor processes. These processes can be found in all domains of human activity, particularly to describe work processes in organizations or learning scenarios. In both cases, we will use the term “activity scenario”. These models are characterized by a sequencing of activities, accomplished by one or more actors who use and produce a variety of resources.

We will first present an instructional engineering method, MISA, which enables designers to produce learning or training scenarios. Then we generalize the notion of activity scenario by

DOI: 10.4018/978-1-61520-839-5.ch008

considering work processes, making a distinction between product-oriented and actor-oriented processes. After that, we present activity scenario modeling tools and a first synthesis of the scenario modeling process that can be applied both to learning and work processes. Through this, we discover that competency modeling is a central element of all these processes.

8.1 INSTRUCTIONAL ENGINEERING AND LEARNING SCENARIOS¹

Instructional Engineering can be defined as “A method that supports the analysis, the design and the delivery planning of a learning system, integrating concepts, processes and principles of instructional design, software engineering and knowledge engineering” (Paquette 2004, p. 56).

Located at the crossroads of these disciplines, from which it inherits most of its properties, Instructional Engineering is a particular systemic method in the field of educational problem solving. It is founded on the System Sciences (Le Moigne 1995; Simon 1973) where a system is defined as a series of units in dynamic interaction, organized in order to achieve specific goals.

The origin of *instructional design* goes back to John Dewey (1900), who, a century ago, advocated the development of an “interlinked science” between learning theories and educational practice. In American literature, this discipline is known as “Instructional Design (ID)”, “Instructional System Design (ISD)” or “Instructional Science” (Reigeluth, 1983; Merrill, 1994). In Europe, one of the pioneers of the field used the term “Scientific Pedagogy” (Montessori, 1958).

Since the fifties, the evolution of this new discipline has been carried by influential researchers such as B.F. Skinner (1959), Jerome Bruner (1966) and David Ausubel (1968). In the seventies and eighties, *instructional theories* have blossomed through the work of researchers such as Gagné (1970), Scandura (1973), Merrill (1983), Landa

(1976), Reigeluth and Rogers (1980), Collins and Stevens (1983), to name a few. These instructional design models and theories have been built on solid foundations and present an impressive body of work. However, today it seems necessary to renew the instructional design methods and tools to support the creation of distributed learning systems (DLS) that are heavily dependent on information and communication technologies.

The MISA Method

There is a large set of interrelated decisions involved when we build technology-based learning systems. These are decisions such as the following. What kind of learning delivery model shall we use or what mixture of these models? What kind of learning scenarios do we need for this course? Should it be predefined, offer multiple learning paths or be learner-constructed? Which actors will interact at delivery time, what are their roles, what resources do they need? What kind of interactivity or collaboration should be included? What are the materials that can be reused and are there new ones to build? What kind of standards will be used? How do we take in account the technological diversity between groups of users within the target population?

To cope with all these decisions and others, we have built an instructional engineering method called MISA over a number of years. This method is the result both of research in the field of instructional engineering, but also of the practical experience acquired through the development of many elearning courses or workplace training. This effort started in 1992 and has led to the MISA 4.0 version (Paquette 2001, 2002) and to a Web-based support tool, called ADISA (Paquette et al 2001). The knowledge editor MOT+ is a key element in the method and is embedded in the ADISA system and accessible through a web browser from any workstation linked to the Internet.

A knowledge modeling approach has been used to define the Instructional Engineering method,

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