Chapter I

Extending UML to Support Business Activity Modeling

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ABSTRACT

This chapter presents an extension that makes UML better suited for business activity modeling. We extend UML's activity diagrams with events in order to make UML more oriented towards modeling of business concepts. The resulting event-activity diagrams have several modeling advantages. They can be used to model a business as a set of concurrent activities that are synchronized by means of shared events and shared objects. This means that business activities can be modeled in a way that resembles the distributed and concurrent activities of real-world business actors. By staying inside UML, we ensure that business analysts and software designers can use the same framework when they collaborate in a systems development project.

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INTRODUCTION

Business activity modeling plays important roles in information systems development. In recent years, we have witnessed increased integration between human activity and activity performed by IT-systems. Internet-based businesses use IT-systems to maintain relations with customers, and to facilitate business transactions like ordering and payment. Hospitals use IT-systems to support medication, patient diaries, and patient administration. Educational institutions use IT-systems to support learning activities. In order to develop relevant IT-systems in such situations, it is necessary to obtain and express an understanding of the business activities (existing or new) within which the IT-systems are going to operate.

The integration of human activity and activity performed by IT-systems forces us to focus on business activities and the roles played by information and IT-systems herein. It is necessary to escape from the software-dominated perspective that characterizes many systems development methods (Jackson, 1983; Jacobson, Booch, & Rumbaugh, 1999; Mathiassen, Munk-Madsen, Nielsen, & Stage, 2000). The underlying assumption of such methods is that analysis and design of human work is outside the scope of systems development.

During the past 30 years, several attempts have been made to support business activity modeling (Avison & Wood-Harper, 1990; Goldkuhl, 1996; Lundeberg, Goldkuhl, & Nilsson, 1978; Nüttgens & Rump, 2002; Rittgen, 2003; White, 2004). Contextual design is a relatively new method for which success indicates that business activity modeling is being re-recognized as an essential systems development activity (Beyer & Holtzblatt, 1998).

UML is a collection of languages that primarily support object-oriented modeling of software systems in terms of flows, objects, and messages (Rumbaugh, Jacobson, & Booch, 1999). UML’s strength is its support for object-oriented software development (Rittgen 2003). Parts of UML support some forms of business activity modeling, but the underlying perspective of such modeling is dominated by object-oriented software concepts rather than business-oriented concepts.

Before UML entered the scene, the world of systems development was dominated by structured methods like structured analysis (De Marco, 1978). These methods recommend that development activities are based on an analysis of current information activities, design of new information activities, and design of software that can perform selected information activities. Ironically, one of the arguments in favour of newer object-oriented methods is that the structured methods focus too much on business activity analysis (Mathiassen et al., 2000).

The purpose of this chapter is to improve UML’s support for business activity modeling. We extend UML’s activity diagrams with shared events. The resulting event-activity diagrams can be used to model relations between triggering events and triggered activity. They can be used to model relations between interrupting events and interrupted activity. They can be used to model business transactions like ordering and payment. Events can be used to synchronize two or more independent activities that are performed by independent actors. Previous versions of our modeling approach were discussed in Bækgaard (2001, 2004).

We begin by providing background information in terms of a discussion of activity systems and languages that support business activity modeling. Next, we present event-activity diagrams in order to extend UML with support for event modeling. We discuss our results and compare them to related work. Following that, we discuss possible future trends and conclude the chapter.
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