Chapter XV

An Extension to a UML Activity Graph from Workflow

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ABSTRACT

This chapter proposes an extension to the activity graph of the Unified Modeling Language (UML) to support the Workflow Management Coalition (WfMC) standard. The definition of a business process has been standardized by the WfMC with the purpose of satisfying the need of interaction and connectivity between process definition tools and different workflow systems. Here, the WfMC meta-model is explained. The UML activity diagrams, used for the business process modeling, support less detail than the WfMC standard. In this chapter, an extension of the UML’s activity graph meta-model is proposed, and its formalization using the workflow meta-model is defined. The purpose of this chapter is to obtain an extension of UML to support the workflow process definition without changing the standard with the same expressive power as the WfMC. It increments the expressive power of the activity diagrams so that the business processes modeled with the UML notation can be executed by a workflow engine.
INTRODUCTION

A workflow process is defined as the automation, in a total or partial way, of a business process during which documents, information, or tasks are passed from one participant to another for action according to a set of procedural rules (Allen, 2000). That is, there is a system that manages the execution of workflows through the use of software running on one or more workflow engines. This environment where the processes are interpreted and executed is called Workflow Management System (WMS). The environment is capable of interactions with participants of the workflow and of invoking tools or applications, when necessary.

A process involves a set of logically-related steps that are executed with the intention of obtaining a particular result (Champy, 1995). A workflow process is a coordinated (parallel and/or serial) set of business activities that are connected in order to achieve a common business goal. Such activities may be manual activities and/or computer-automated activities. There are also human as well as material resources and business procedures involved; all of them with the purpose of producing a benefit for the organization.

A workflow process is a special case of a business process, i.e., it is a business process that is automated (Allen). Therefore, there are details in the workflow process that are not necessary in the normal business process, but are essential in a workflow for their execution by the Workflow Enactment Services (WfES).

The process modeling or business modeling is a means to help in the visualization of tasks, activities, and flows of a process. It also shows the different organizational units involved in the process (Jacobson, 1996; Davenport & Young, 1990; Hammer & Champy, 1993).

In the development of every industry, it is very important to have a coherent, well-planned process. A coherent, well-planned workflow provides much better possibilities: faster adaptability, easier reengineering, and simulation of the future processes. In any case, a coherent, well-planned representation of the process is advisable, and sometimes indispensable, to ensure that an organization does the right things at the right time and in the right way.

A UML activity diagram (Rumbaugh, Jacobson & Booch, 1999) is an example of a tool that may be used to build models of organizational processes. It might as well be employed for modeling computational processes (Rumbaugh, Jacobson & Booch, 1999). However, while each of these models is created in a different application domain, both strive to put software into context. That is, both business process engineering and product engineering work to allocate a role for computer software and, at the same time, to establish the relationships that tie software to other elements of computer-based systems. Workflows are a special case of business processes that are much more intrinsically-related to software; that is, because the activity diagram would be a tool for business. Nevertheless, the activity diagram’s notation supports a relatively high level of abstraction. Some details cannot be properly modeled, and this produces ambiguities and/or inconsistencies in the interpretation. Therefore, a process specification based on activity diagrams would not be correctly interpreted and executed automatically by a workflow engine.

The level of details supported by this notation is not adequate to model the major specificity that present the workflow processes. A workflow process has its own details
Using the Semantic Web Rule Language in the Development of Ontology-Driven Applications
Martin O'Connor, Mark Musen and Amar Das (2009). Handbook of Research on Emerging Rule-Based Languages and Technologies: Open Solutions and Approaches (pp. 525-539).
www.igi-global.com/chapter/using-semantic-web-rule-language/35873?camid=4v1a