Chapter 9
Model-Based Validation of Business Processes

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ABSTRACT

Validation should be done in the context of understanding how a business process is intended to contribute to the business strategies of an organization. Validation can take place along a variety of dimensions including legal compliance, financial cost, customer value, and service quality. A business process modeling tool cannot anticipate all the ways in which a business process might need to be validated. However, it can provide a framework for extending model elements to represent context for a business process. It can also support information exchange to facilitate validation with other tools and systems. This chapter demonstrates a model-based approach to validation using a hospital approval process for accessing patient data in a data warehouse. An extensible meta-model, a flexible data exchange layer, and linkage between business processes and enterprise context are shown to be the critical elements in model-based business process validation.

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1. INTRODUCTION

In today's ever changing world, organizations need to make their business processes as agile and flexible as possible. Some organization may even go as far as using adaptive processes that evolve constantly (Baresi & Pasquale, 2010). To achieve this goal, they need to have an extensible business process management framework (Chung et al., 2004). Ideally, one should be able to leverage a model-based approach throughout the framework in order to support business process management via an explicit representation of the processes. In particular, one would like to integrate support for verification and validation into both the modeling tool used and the overall management framework.

Business process modeling tools are able to provide rich support for verification including simulation to verify functionality and optimize process execution as well as formal checking to ensure consistency, correctness and completeness. However, validation of business processes is more challenging. To validate a business process, one has to reason about the enterprise context in which the process is situated and integrate with tools and systems outside of the modeling tool itself. One has to consider how the business process is intended to contribute to the goals and strategies of an organization and be able to validate on an ongoing basis in production that it is continuing to contribute in the intended manner. There are also many dimensions along which processes could be validated within an enterprise context, including legal, financial, customer value, and quality. A modeling tool cannot possibly anticipate all the different ways in which a business process will need to be validated. However, a modeling tool should ideally provide a framework for extending the model elements it supports in order to represent context information. It should also provide a mechanism for exchanging information in order to facilitate model-based validation in collaboration with other tools and systems.

In this chapter, we take the case of an approval process at a major teaching hospital for access to sensitive patient data in a data warehouse and demonstrate a model-based approach to validation. The process is described at the operational level together with how it is aligned with the organization's business objectives and policies. We show how a modeling tool (Mussbacher, 2010) can be extended and integrated with a performance management system (IBM, 2010). The purpose of this is to validate the performance of a business process in production against key performance indicators. We also demonstrate how the same tool can be extended and integrated with a requirements management system (Rational/IBM, 2010), in order to verify compliance with applicable legislation, especially privacy. The business process model was defined using URN, the User Requirements Notation (ITU-T, 2008). An extensible meta-model, a flexible data exchange layer, and the ability to model the linkage between business processes and enterprise context are shown to be the critical elements in model-based business process validation.

2. BACKGROUND

2.1. User Requirement Notation and the jUCMNav Tool

The User Requirements Notation (URN) is an ITU-T standard (ITU-T, 2008) that combines goals and scenarios in order to help capture, model and analyze user requirements at the early stages of design. It can be applied to describe most kinds of reactive and distributed systems as well as business processes. URN is the only modeling language that can model goals and processes at the same time while providing traceability between them. URN integrates two notations, namely the Goal-oriented Requirement Language (GRL) and Use Case Maps (UCM). GRL is used to model, with AND/OR graphs, the relationships and strate-