Chapter 24

A Methodology for Adaptive Workflows

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A workflow methodology is required to analyze business logic and model workflow components. Current studies handle business process modeling and workflow modeling in an independent manner, making it hard to analyze the information system and organization requirements while modeling business logic. Moreover, current methodologies also lack support for modeling complex dynamic processes in adaptive workflows. In this chapter, a methodology is proposed to unify business process modeling and workflow automation. The information system and organization perspectives of workflow are identified in each development phase. An analysis of the domain and an object notation in the methodology can help to build a stable system.

INTRODUCTION

Workflow provides a way to automate business processes. A workflow methodology is important for the analysis of business logic, and to model workflow components. Many commercial products provide guidelines for workflow design. These guidelines can be regarded as methodologies (Changengine admin Edition Process Design Guide, 1998). However, they are based on specific workflow products. A general methodology can facilitate heterogeneous workflow application. Unfortunately, there are only a few general approaches for analysis and design, such as WIDE (Baresi, Casati et al., 1999) and Derung’s approach (1997).
WIDE (Baresi et al., 1999) proposes a methodology for supporting workflow design, which is divided into three phases: workflow analysis, workflow design and mapping to target workflow systems. The workflow analysis starts from existing well-defined business processes, goals and external Information systems. The business process goals and characteristics are analyzed to determine the "workflowability" of the proposed business processes. In the design phase, the normal process flow is decomposed into sub-processes, super-tasks, business transactions, and tasks. A pattern-based approach is adopted for specifying typical exceptions to the normal flows. In the mapping phase, the results of design are mapped onto commercial workflow products and standard workflow models.

Derungs et al. (1997) propose a methodology to support the transformation of business processes into workflow applications. The methodology contains three central steps: Requirement Specifications, Conceptual Design and Realization. The Requirement Specification investigates the data and function requirement gaps between the process design and the As-Is-System, and then identifies the relevant workflow. Following that, the requirements and a plan for the infrastructure are determined. The Conceptual Design identifies activities, assigns them to work steps and describes the activities for the program design from the business viewpoint. The integration mechanism and the dialog for the user will be determined in this phase. The organization structure is designed and implemented too.

Michael Amberge (1997) proposes a two-stage modeling procedure for the development of workflow relevant application. The first-stage uses business process modeling to identify the relevant business tasks to be supported. The second stage uses workflow modeling to specify in detail the domain-related requirements for workflow application. However, no further details on notation and step-wise guidance are presented.

In these studies, business process modeling and workflow modeling are separated. Workflow methodology is used to automate a well-defined process. This is also true for most workflow products. For example, ARIS (1997) is a process modeling tool and FlowMark (1996) is a workflow modeling tool. An ARIS-to-FlowMark interface (1997) is used to integrate them. However, this separation results in several drawbacks. Firstly, since the process model and workflow model use different notations and tools, integration can be costly. Secondly, workflow automation can affect business logic. For example, a traditional commerce payment process is different from e-commerce payment process, since the latter has to consider network security problems. A well-defined business process may have to be changed when workflow is automated. It would be better to identify such changes as early as possible. Thirdly, workflow systems usually focus on hardware/software integration, resource integration and organization coordination. On the other hand, business processes only emphasizes on functional re-

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