Chapter VII

ICN–Based Workflow Model and its Advances

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ABSTRACT

This chapter introduces the basic concepts of information control net (ICN) and its workflow models. In principle, a workflow model is the theoretical basis of a workflow modeling methodology as well as a workflow enactment architecture. Particularly, the workflow model is directly related with how its major components are embodied for implementing the underlying workflow enactment system, too. Accordingly, the authors describe the graphical and formal representations of ICN-based workflow model and its advanced models—role-based model and actor-based model—that can be automatically transformed from the ICN-based workflow model in order to improve their verifiability, maintainability and usability. Conclusively stating, we strongly believe that the ICN-based workflow model and its advanced models be very useful not only for maximizing the quality of workflows but also for strengthening theoretical backgrounds of the recent research issues, such as workflow verification/validation, workflow reengineering, workflow intelligence, workflow mining/rediscovery, and advanced workflow architectures, and so on.

INTRODUCTION

In general, a workflow management system consists of two components—modeling component and enacting component. The modeling component allows a modeler to define, analyze and maintain all of the workflow-related information which is necessary to describe a workflow procedure, and the enacting component supports users to play essential roles of invoking, execut-
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In this chapter, we introduce a typical workflow modeling methodology, the so-called information control net abbreviated to ICN, and describe the basic concept of ICN-based workflow model and its formalism through graphical notations and their different ways of executing workflow procedures and different efficiencies as well. Therefore, the workflow model and the workflow architecture have to incorporate the advanced technological and organizational features so that the corresponding workflow management system not only displays an efficient way of modeling work and effective supports of executing performance, but also acclimates itself to a new technological and organizational environment. As the important technological trends that may affect the innovation of workflow model and architecture, we consider the powerful networked personal computing facilities like Grid/P2P computing environment, and the increasingly large and complex workflow applications; The advanced workflow models and their architectures introduced in this chapter are the outcomes of those research activities trying to improve the expressiveness of the traditional workflow model and architecture for acclimating the recent technological trends.

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![Figure 1. The constituents of a workflow management system](image)