

A Business Process Management System based on Workflow Technologies

Meng Fanbo

School of Economics and Management
Shenyang Ligong University
ShenYang, China
gangwan5758@tom.com

Jin Minli and Peng Wuliang

School of Economics and Management
Shenyang Ligong University
ShenYang, China
Peng-wuliang@163.com

Abstract—Due to the requirements of business process redesign (BPR) or business process integration, the business process management system is regarded as a new technology and has attracted a lot of academic attention. In this paper, a business process management system is analyzed and designed. After giving the relative concepts, such as schemas and instances, we presented conceptual design by using the class diagram, and the control flow is analyzed. Subsequently, the Architecture of BPM based on workflow technologies is designed. Finally, the business process management system is developed by using Java EE technologies and the models and architecture is verified.

Keywords—business process management; workflow; object-oriented method

I. INTRODUCTION

Due to the requirements of business process redesign (BPR) or business process integration, the business process management system is regarded as a new EAI technology and has attracted a lot of academic attention[1]. From the literatures in the past years, most researchers consider business process management (BPM) to be the “next step” after the workflow technology[1,2]. Therefore, we use workflow terminology to define BPM in this paper.

The Workflow is defined by Management Coalition (WfMC) as: “The automation of a business process, in whole or part, during which documents, information or tasks are passed from one participant to another for action, according to a set of procedural rules.” [3]. WfMc also defined Workflow Management System (WFMS) as: “A system that defines, creates and manages the execution of workflows through the use of software, running on one or more workflow engines, which is able to interpret the process definition, interact with workflow participants and, where required, invoke the use of IT tools and applications.” [3]. Note that both definitions emphasize the focus on enactment, i.e., the use of software to support the execution of operational processes. In the last couple of years, many researchers and practitioners started to realize that the traditional focus on enactment is too restrictive. As a result new terms like BPMS have been coined[4]. There exist many definitions of BPMS but in most cases it clearly includes Workflow Management (WFM)[5,6,7]. Summarizing the current researches, BPMS can be defined as: The information system supporting business processes using methods, techniques to design, enact, control, and analyze operational processes involving humans, organizations, applications, documents and other sources of information.

In this paper, we designed a Business process management system to manage business process by using WFM technologies and Object-oriented Method, and it is named business process management system based workflow (BPMWF). After giving the relative concepts, we presented conceptual design by using the class diagram, and the control flow is analyzed. Subsequently, the Architecture of BPM based on Workflow technologies is designed. Finally, the business process management system is developed by using Java EE Technologies.

II. SCHEMAS AND INSTANCES

Business process management system and workflow management system deal explicit modeling of the automated parts of application processes with the aim of controlling their execution in given technical and organizational environments. BPMWF is software system which is designed to perform this task. In order to do so, a workflow management system needs a specification of the automated parts of application processes and the organizational and technical environment in which they will be executed. These specifications are known as schemas. When an application process starts, an internal representation of the automated parts of the business process is created. This representation is called instance.

III. THE DESIGN OF WORKFLOW SYSTEM

This section presents the conceptual design of BPMWF. The entity class model is shown in Figure 1. It is described using the Uniform Modeling Language (UML), which is an object-oriented modeling and design language. In the entity class diagrams, the workflow class is the central class in the meta-schema, which is either BPMWF schema object or instance object. Workflows can be classed into simple workflow and business process, and this property of workflows is reflected in meta-schema by defining business process and simple workflow as sub-classes of workflow class. The workflow hierarchy (i.e., the relationship between a business process and its sub-workflows) is modeled by BF-WF Relationship class, which defines a relationship between business process and simple workflow.

Schemas and Workflow instances are identified by different states of workflow objects. We remark that no object changes its state from “schema” to “instance” or vice versa. There are constraints on relationships of instances and schemas, which can be specified in UML. One constraint involves the structure of business process and its instances. While each instance can only be simple workflow of one business process, workflow schemas can appear as sub-