Dynamic Workflow of Clinical Pathway System

Lin Tongchuan and Qi Deyu

Research Institute of Computer Systems
South China University of Technology
Guangzhou 51006, China
{linckham,qideyu}@gmail.com

Abstract. Workflow is one of the important technologies in enterprise business process automation. It has many advantages such as raising efficiency of business operation, improving resource utilization, increasing flexibility and adaptability of business execution and so on. However, traditional workflow systems have shortcomings of hard coding and flexibility. Based on the analysis of these shortcomings, a dynamic workflow system based on rule engine is put forward to enhance the flexibility of the system. This system has greatly improved the maintenance and flexibility.

Keywords: Workflow, Rule engine, Clinical pathway.

1 Introduction

For last ten years, many researchers have given different definition for workflow. So far, there is not completely unified definition for workflow. For example, the definition of Workflow Management Coalition WFMC[1], IBM Almaden Research Center[2], Amit Sheth[3] and W.M.P. Van der Aalst [4]. According to these definitions and myself understanding of workflow, in this paper I give a definition: Workflow is a computing model of working process, that is saying how the work of the workflow before and after the organization together in the computer logic and rules of the appropriate model to represent and calculate its implementation, in short, business process automation or semi-automated implementation. Workflow mainly includes the concept of business process, definition of process, activity, workflow management system and the instance of process [5].

Rules engine is a component that is embedded in the application. Its task is to test and compare the current submitted to the engine’s data object and the loading business rules in the engine, activating the business rules which are consistent with the current data status, according to the execution logic declared in the business rules, trigger the operation of the corresponding application. The rules engine contains the functional modules of context, agenda, working memory and rules container [6].

Clinical pathway is a means to establish a standard for a particular disease, treatment modalities and therapeutic procedures, is a comprehensive model on clinical treatment. It can promote the treatment organization and the methods of disease management, which is based on medical evidence and guidelines; finally it can achieve the purpose to regulate medical practice, reduce variation, reduce costs and
improve the quality. Relative of the guide, the content of clinic pathway is more concise, readable, and adapting for multi-disciplinary, multi-section action. It is for diagnosis and treatment of specific disease process, it focuses on synergy, result and time during the process of treatment [7].

The existing operating model of workflow system has some flaws and limitations when it applies for actual application [8]. Firstly, the rules of business process are fixed in the code by the form of “If-Then-Else”; secondly, most workflow systems lack of central rules information repository, centralized management mechanism of rules and strategy; finally, in response to complex business rules and record variations, the workflow system can’t handle these complex rules and rapidly respond to changes in the rules. However, the introduction of the rules engine technology can bring great improvement in this situation. The rules engine technology separates the business logic code from the application and defines these codes as rules that computers can identify. Rules engine is charging for rules management, maintenance and computing, providing rules service for workflow engine and providing operating pages for business operator. The function of rules service is to reason and compute the rules in the context, and return the result for the process instance. Workflow engine is particularly charging for process operation, sometimes calling the rules of business decisions when necessary. When business rules have changed, there is no need for modifying relative source code; it only need update the rules repository in the edit pages by business operator. This system has greatly improved the maintenance and flexibility.

2 Overall Design

2.1 System Framework

Dynamic Workflow of Clinical Pathway System adopts the classic MVC framework, Struts is used for presentation layer, Spring is used for business layer, Hibernate is used for persistence layer. The development environment of system is MyEclipse6.5 +Tomcat6.0+JBoss Rule+Oracle9i; The framework of system as show in Fig.1.

Fig. 1. The framework of clinical pathway system