

Workflow Engine for Mobile-Based Healthcare System

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Abstract

The recent push for healthcare reform has caused healthcare organizations to focus on ways to streamline processes in order to secure high quality care as well as reducing costs. Healthcare enterprises involve complex processes that span diverse groups and organizations. These processes involve clinical and administrative tasks, large quantities of data, and large number of patients and personnel. We propose the mobile-based workflow system of passable communication as an important factor in the B2B healthcare. Based on the above proposal the workflow system of business process was designed and implemented on the basis of Java, UML and XPDL.

Key Word : Modeling, Mobile, Workflow, Healthcare, Communication

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1. Introduction

Business process means tasks, limited conditions and a serial processes including resources to achieve the goal. The business process is important because it enhances the effective activities of organization through the structure provided [1, 2, 3]. The most important information technology in the business process is the workflow consisted of process, information and organization as basic elements. And Workflow Management System(WfMS) instruct, mediate and control the tasks to be done successfully[4, 5].

The healthcare business process applied as shown in this paper consisted of properties related to complicated and diverse organizations. Especially, business processes change dynamically according to the behaviors of each healthcare sectors[6]. Moreover, for the case of hospital material purchasing task the connection forms between supplier and hospital are established through many wholesale merchants participated. Currently, by introduction of e-commerce system brought the hub site applied healthcare B2B[7]. Efforts focused on the workflow introduction for the entire processes optimized to enhance productivity. In this paper, for the process of hospital materials purchasing, healthcare B2B workflow system was implemented. The modeling tool proposed enables important communication in the process of hospital materials purchasing. And the modeling tool was applied for the mobile-based workflow engine.

2. Workflow Modeling Tool Using Communication Patterns

The healthcare B2B workflow demands an effective working environment to define and accomplish the diverse business processes generated among sectors. A workflow management system supports the definition and execution of workflow processes that model business applications through a coordinated set of process activities. A process activity may be a manual activity or an automated activity. A manual activity can be represented as a work item in a work list pending completion by a workflow participant. In this paper, the specification[8, 9] of WfMC(Workflow Management Coalition) based workflow participants were divided into manual and automated process. The workflow modeling method on the basis of this conception has a structure divided into two layers of task and actor (see Figure 1).

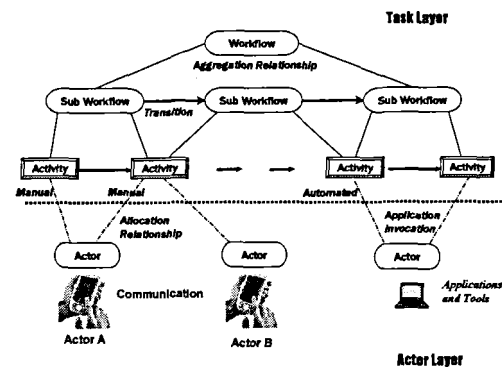

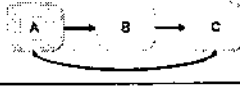




Figure 1: Structure of Workflow Modeling

The workflow modeling method adopted in this study is hybrid concept of the activity-based modeling method and the communication-based

modeling method. An advantage exists in practical possibility of healthcare B2B by systematic combination of the mobile-based task and information flow. Referring some studies on workflow pattern[10, 11] the present paper was proposed focusing on the communication pattern[see Table 1].

Table 1: Communication Patterns

Pattern		Notation
Communication Pattern	Static Configuration	
	Dynamic Configuration	
	Multi-Dynamic Configuration	
	Dynamic Configuration	

In this paper, UML was expanded and diagrammatized to apply for business progress and in respect of workflow process. The workflow progress definition language XPDL was used and defined for the exchange of process. The healthcare B2B workflow modeling method implemented with above mentioned are as shown in the Figure 2.

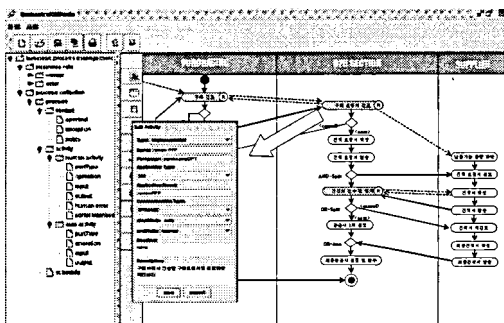


Figure 2: Workflow Modeling Tool for Healthcare B2B

3. Workflow Engine for Mobile-Based Healthcare

The mobile-based workflow engine is used to manage the workflows or business processes created by the business process modeling tool and simulate the executions of them.

The main functions of the system include:

- The user management including new user registry and user login.
- The project management includes project creation and display of projects information.
- The simulation of the workflow or business process execution.
- Automatic Data storage function

1) User login

The "User login" Window will turn up every time when a user initiates the system. The user must input the proper user name and password to login before using the system. The following figure 3 shows the UI of "User login".

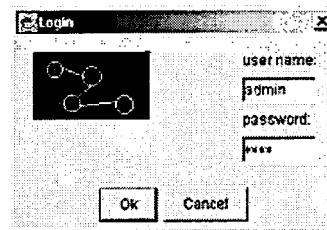


Figure 3: User Login Window

2) Project management function

- Project creation

After a user enters the system, the user can create a project related to a workflow or a business process. The following figure 4 shows

the main UI of the system after a user enters the system.

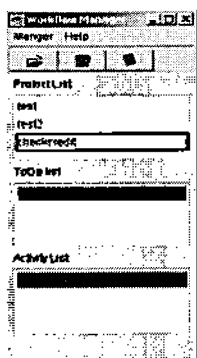


Figure 4: Main UI of the System

- Display of projects information

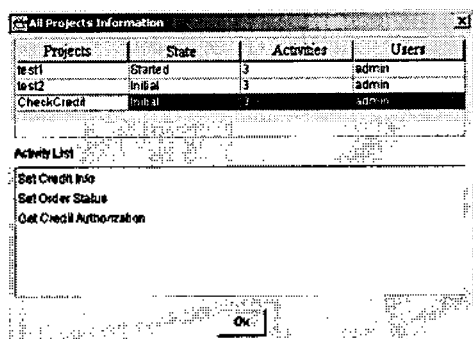


Figure 5: Projects Information Dialog

After a user login to the system, the user can check up the all projects information by selecting "Projects Information menu item in the "Manger" menu. Then a "All Projects Information" dialog will turn up(see figure 5).

The dialog shows the information of all projects created in the system. There are four columns in the table of the dialog, which are "Projects", "State", "Activities" and "Users". The Activity List will list all activity names and the current states associated to the project which the

user select in the table.

4. Conclusion

Currently, the principal infrastructure has seldom provided for the effective operation of B2B to drive healthcare business, moreover, the purchasing process between hospital and supplier in electronic procurement system has been found ineffectual. For healthcare, the successful human communication create a superb work efficiency, and provide clients satisfaction consequently.

In this paper exploited the mobile based healthcare B2B workflow system for the effective communication. For the first, the workflow modeling method originated from WfMC, the application method of property and the pattern of workflow was proposed. In addition, in the field of healthcare which requires a sound communication, the communication pattern was emphasized to create an efficient workflow modeling. The mobile-based workflow engine was proposed for the workflow process modeled to be exchanged and executed. For the optimum process in the material purchasing business, an efficient communication could be provided by the workflow system in the field of health as shown in this paper.

The further studies are required on the exploitation of varieties of workflow systems in HIS(Hospital Information System) including PACS(Picture Archiving and Communication System) and OCS(Order Communication System).

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