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An Auto-management Thesis Program WebMIS Based on Workflow

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Abstract

An auto-management WebMIS based on workflow for bachelor thesis program is given in this paper. A module used for workflow dispatching is designed and realized using MySQL and J2EE according to the work principle of workflow engine. The module can automatively dispatch the workflow according to the date of system, login information and the work status of the user. The WebMIS changes the management from handwork to computer-work which not only standardizes the thesis program but also keeps the data and documents clean and consistent.

Keywords: workflow；self-management；WebMIS

1.Introduction

WebMIS is more and more popular for its hyper-text link, platform irrelevant, distributed, dynamic and alternative features. But for the MIS in which operations demand time limit and/or have compulsive logical relationship, the Web based on TCP/IP will not work well[1].

Workflow is a series of tasks which are linked up and can be processed automatively. Workflow management system is a computer system which not only can define, process and manage the workflow, but also can coordinate the information among workflow and users. The workflow should be handled only by workflow management system.

Workflow technique is a new domain comprised of multiple subjects, which draws more and more attentions for its effectuality in applications. Workflow reference model among different workflow management systems and a series of workflow industry standards are set by the Workflow Management Coalition, which is the workflow industy standardization organization and was founded in 1993. There are

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3 main aspects in workflow technique research including workflow theory research, workflow system realization technology research and workflow application research now[2].

The bachelor thesis program is manually managed in which the computer and Internet are used just as a tool in our university for a long time. The form of bachelor thesis program is more and more diversified and more and more people prefer to communicate and transform their documents on the Net. In order to meet these requirements, the thesis management WebMIS is designed and programmed, which enhances management from handwork to computer-work. The WebMIS not only can dispatch task automatively according to the preseted task schedule and the user work status but also can standardize documents during the thesis program automatively according to the data in the system, which not only improves the efficiency of the thesis program management but also ensures the uniformity of the documents and data of the system.

2.WebMIS Desigen

The thesis management WebMIS is designed and developed on Linux platform, in which the Apache and Tomcat are used as web server and MySQL is used as database server. MVC is selected as the development model and the system architecture is in conformity to J2EE.

The rules and regulations of the thesis management include thesis mobilization, program planning, user qualification, thesis topic submission and checking, two-way selection between teachers and students, thesis openning report, thesis monitoring and checking, thesis paper and result submission, thesis evaluation, thesis debate scheduling rejoin arragement, thesis result management, leader inspection and other tasks are analyzed and optimized firstly.

The basic function of the system is extracted according to the user requirement and the rules and regulations of thesis program management. In order to highlight the time-limitation and logicality of each work flow, the thesis program is divided into 12 operation flows, illustrated in figure 1, including mobilization and arrangement, thesis topic submission, thesis topic selection, thesis openning report, intermediate checking, thesis results submission, thesis results evaluation, thesis scoring arrangement, abnormal operation processing, communications arrangement, inspection and checking, data statistics and the system business flow diagram.

According to the user qualification, the user of this system is categorzed into teacher, student, leader and seceretory. The final work flow of thesis program management and system functions are determined after being modelled and optimized. The relationship among operation flow, user actors is determined as described in figure 2.

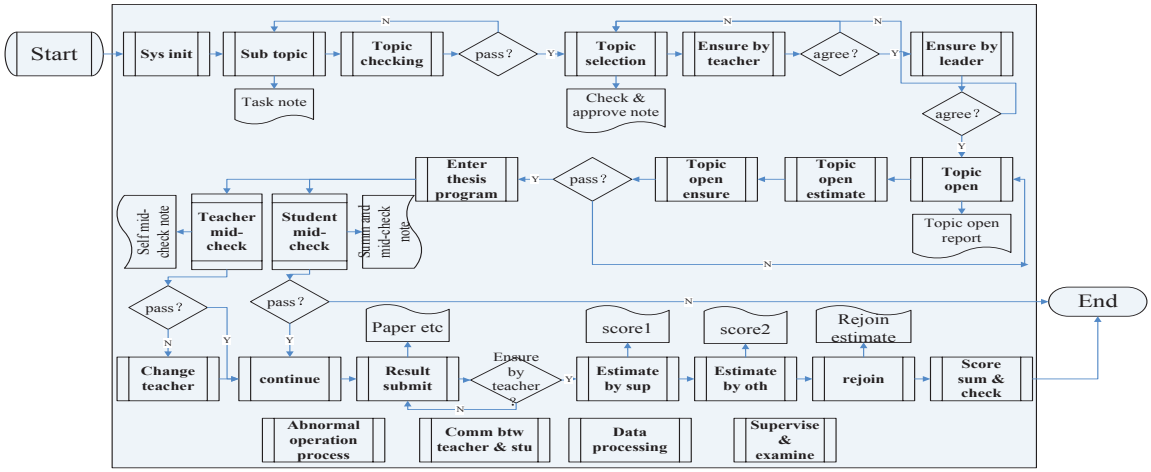

Figure 1. Diagram of System Business Flow

Figure 2. Relatiaonship between Users and Main Workflow

3.Workflow Engine Design

Workflow dispatching is automated in accordance with the preset rules which can not only make the system auto-managed but also make the workflow management system different from others webMIS[3].

Data in the auto-management thesis program webMIS is divided into 2 classes, one is data used to define and control the workflow including workflow definition, running environment and status of workflow description, dispatching rule of the workflow engine, user information etc. . The other is data generated during the thesis program operations such as thesis topic information, thesis topic selection information, thesis topic openning information, intermediate-checking information, thesis results and thesis results evaluation information[4].

Workflow engine is a software application that manages and executes modeled computer processes, which is a key component in workflow technology and typically makes use of a database server. The workflow engine interprets events according to defined computer processes and facilitates the flow of information, tasks, and events[5].

It is not feasible to buy a workflow engine in our thesis program WebMIS because of the cost. We should design a light workflow engine worked on relational database. [6~8] gave some advices on workflow engine design. In this auto-management thesis program webMIS, a module used for work flow dispatching is designed and developed based on J2EE and MySQL which indicates the work flow of the thesis program according to the work principle of workflow engine. The module can dispatch the workflow according to the date of system, login information and the work status of the user automatively. The detailed operations of the module are given in the figure 3.

User information, schedule of the bachelor's thesis program and the abnormal task table are required for the workflow auto-dispatching module. In this self-management thesis program webMIS, all the user information is entered into the database during the system initialization.

Schedules of the program are formated into a database table including the following fields: taskID used to identify the unique task, taskName used to name the task, prevTaskID used to store the directed previous task ID, nextTaskID use the store the directed subsquent task ID, taskPage used to store the task process

page name, taskResult used to describe the task result, resultPage used to store the page name through which the task result can be used, resultUsers indicates who can use the task result, startDate is the start date of the task, endDate is the date by which the task should be finished, excutor is the actor of the task excutor, taskDescription used to describe the task.

The workflow engine provides the task interface only when the previous task has been finished on time and the date is the preset date for this task. If the previous task is not finished on time, the workflow engine provides the user an interface to fix it upon approval. This workflow jumps according to an abnormal task table which includes fields such as userID used to indicate who should finish this task, userClass gives the usr class, taskID is the task ID, appID is the ID of abnormal task application, appDate is the date of abnormal application, appApv is the user who approved the abnormal task application, apvDate is the date of the application being approved, appLog is the user who logs the application in the system, appLogDate is the date of the application being logged, taskStartDate is the start date of the abnormal task and the taskFinishDate is the date by which the abnormal task should be finished.

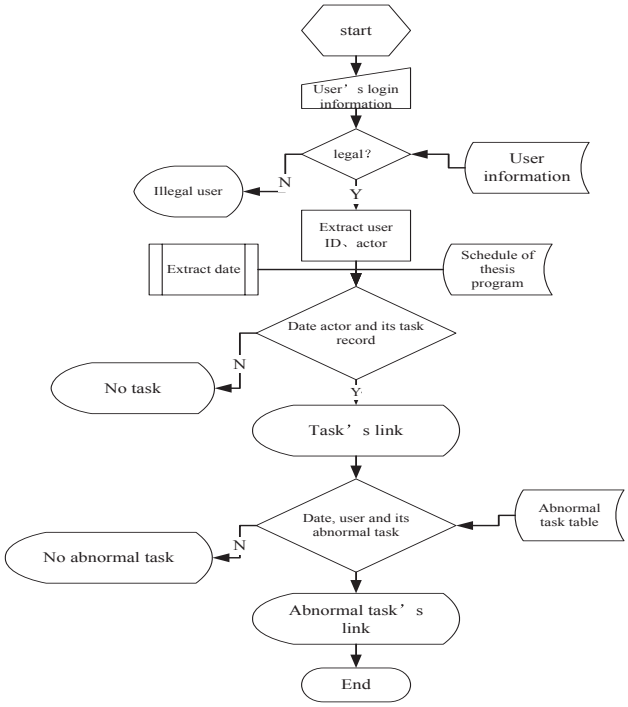

Figure 3 Chart of the Workflow Engine of the Thesis Program WebMIS

4.System Structure And User Interface

In the self-management bachelor’s thesis program webMIS, all of the workflows are controlled by the workflow engine which is a servlet. Tasks are processed through the jsp page given by the workflow engine. In this self-management bachelor’s thesis program webMIS, java beans are used to handle the business operation as the model in MVC, java servelets are used as a controller to receive input and initiate a response by making calls on model objects, jsp web pages are used to render the model into a user interface suitable for interaction. The detailed system architecture is given in figure 4.

There are 3 layers of the interface pages in this system. The first layer is the homepage of the system, which provides an interface for users to log in the system and some hyper text links to download notice and reference documents. In order to improve the stability and security of the WebMIS, the validate code is

used while logging, Email url is validated by regular expression and the ID code is also validated.The actor homepage is the second layer interface page including title, navigation bar and main display area. The navigation bar is created by the workflow engine automatively according to the user and date. The third layer is the interface jsp pages which display in the main display area in the actor homepage. The detailed structure and the interface of the WebMIS are given as figure 5, the homepage of the system and the actor homepages are presented in figure 6.

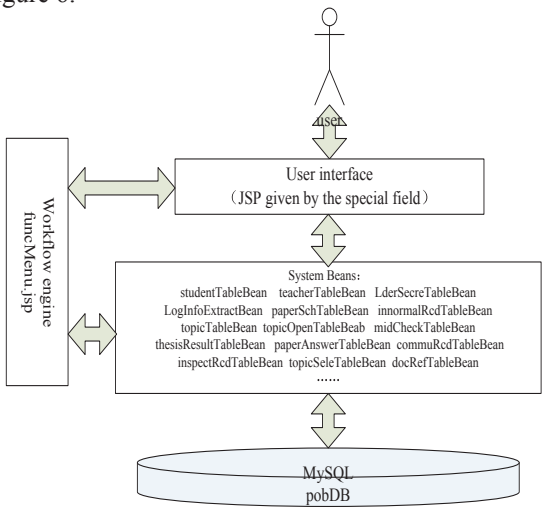

Figure4 System Architeture

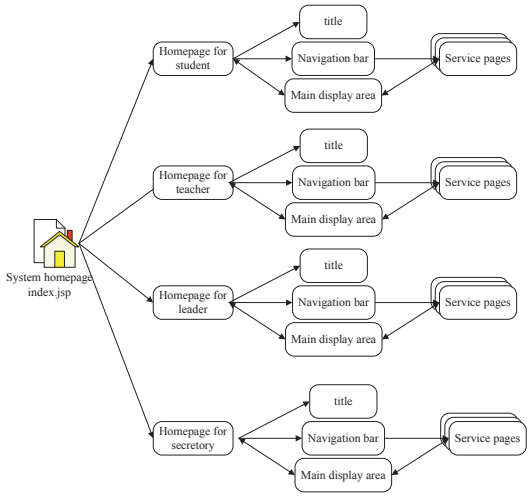

Figure5 System Structure Map

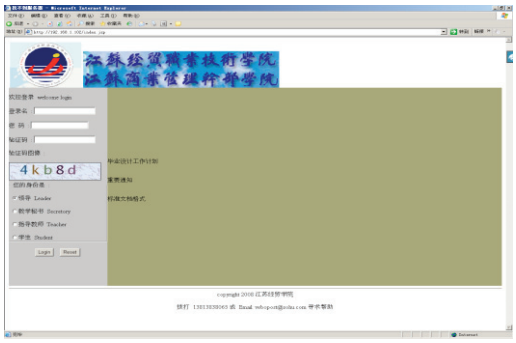

Figure6A Structure Map of the System Homepage

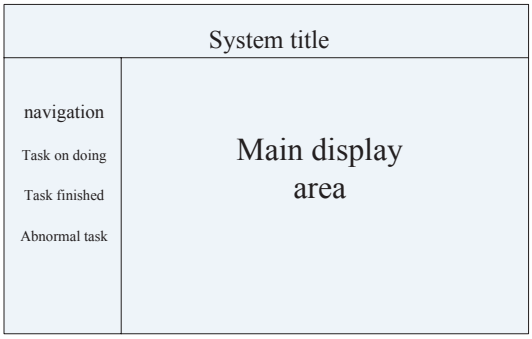

Figure 6 B Structure Map of the Homepage for Each Actor

5.Conclusion

This auto-management bachelor's thesis program webMIS has been implemented using Linux platform, on which Apache and Tomcat are used as web server, MySQL is used as database server. The webMIS can manage the whole workflows of the program according to the preset scheduling and managemet rules. This webMIS not only standardizes the bachelor' thesis program management, but also keeps all the data and documents clean and consistent. The webMIS has been used in test running and was approvaled by teachers, students and leaders.

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