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Conference Management System

Hui Guan

A Project

In

The Department

of

Computer Science

Presented in Partial Fulfillment of the Requirements

For the Degree of Master of Computer Science at

Concordia University

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ABSTRACT

Conference Management System

By Hui Guan

Internet has been recognized and accepted by the public and organizations around the world as a new and exciting opportunity for expanding the management through WWW site and changing the way those companies, large and small, do business. Conference Management System (CMS) – a web-based information and database management application system is developed to provide the solution to a large academic information management system for international professional conference. CMS consists of a 3-tier client/server application framework. CMS object is not a monolithic piece of code; instead, it is more like a Lego of cooperating parts that we can break apart and then reassemble along the 3-tier client/server line. The front tier displays the visual aspects of the CMS. These visual objects typically live on the client. The middle tier works with the server objects that represent the persistent data and the CMS logic functions. The back tier is the database that stores all the system information, and it can also be administrated without influences from the front and middle tier. Middle-tier server objects interact with their clients (the view objects) and implement the logic function of the CMS. The main functions of Conference Management System (CMS) are to interactively collect conference papers and their corresponding information from the web site, putting them into database and then allocate these papers among the Program Committee members. Also it provides all the information to the General Chair and assists administrating the Conference Management System and database.

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1 Introduction

Information System has become a powerful solution to the efficient organization management. Internet has been recognized by organizations around the world as a new and exciting opportunity for expanding the enterprise through Web sites. A web application can be as simple as a keyword search on a document archive or as complex as an electronic storefront. Web applications are being deployed on the Internet and on corporate intranet and extranet, where they have the potential to increase productivity and change the way that companies, large and small, do business. The project of Conference Management System gives a great inspiration to practically explore more opportunities in this field. This document is a record of techniques used in developing this useful high tech system.

Conference Management System (CMS) is a web based information and database application system using a 3-tier client/server application framework. CMS object is not a monolithic piece of code. Instead, it is more like a Lego of cooperating parts that we can break apart and then reassemble along the 3-tier client/server line. The first tier represents the visual aspects of the CMS. These visual objects typically live on the client. In the middle tier are server objects that represent the persistent data and the CMS logic functions. In the third tier are existing databases. Middle-tier server objects interact with their clients (the view objects) and implements the logic function of the CMS. They can extract their persistent state from the multiple data sources. For example, SQL databases

or HTML files. The server object provides an integrated model of the disparate data sources and back-end applications. Client never directly interacts with third-tier data sources. These sources must be totally encapsulated and abstracted by the middle-tier server objects.

The main functions of Conference Management System (CMS) are to collect papers and author information from the web site, put them into database and then allocate these papers among the Program Committee (PC) members. Also it provides all the information to the General Chair (GC) and assists him to administer the Conference Management System and database. Many of these functionalities are performed by the system. In analysis, design, implementation and testing, so many useful methods, techniques and methodologies can be learned. This project is aimed at getting a better understanding of the general aspects of the software development process and exploring some widely used techniques in the software development.

This report is divided into seven parts. Chapter one is the introduction of the project. Chapter two provides a whole picture and the features of the CMS system. Chapter three, four and five are system requirements, designs and database design. Chapter six is system testing. The last part, chapter seven, points out the possible problems of the implemented system and what can be improved in future.

2 System Description

2.1 The System Components

The Conference Management System provides a number of independent services from Web based user interface through Internet. They include the following:

- 1) Authors can submit their personal information and papers to the CMS system through the Internet.
- 2) Program committees (PC) members can register their personal information with the web based user interface.
- 3) The system can automatically allocate the papers among the PC members who will be responsible to review the papers.
- 4) PC members can download the paper files that they are to review and send their reviews to the system through the web.
- 5) The system can help the General Chair (GC) to automatically send reminder email to the PC member.
- 6) The system can generate summery reports and tables on the web page to assist the GC to maintain the information for the conference through the Internet. The system classifies user privilege levels for authors, PC member and GC. Also, object-oriented design principle is used for easy extension of the system to meet the need of the future changes of information and their applications.

2.2 Software Used

The CMS is a 3-tier client/server application. HTML is used as the front-end of the server. The middleware is Servlet server and the back-end is MySQL, which is the database management system. Also the project uses the JDBC to access the MySQL database. Client side only needs web browser to run the client program. After server is set up, client side can run client program by accessing the following URL:

<http://cindi.cs.concordia.ca:88/forms/Confsys.html> in the web browser.

2.2.1 Servlet

In this project, Servlet is one of the key components of server-side Java. A Servlet is a small, pluggable extension to a server that enhances the server's functionality. Servlets are commonly used with web servers, where they can take the place of CGI scripts. Servlets are Java technology's answers to Common Gateway Interface (CGI) programming. By comparing with traditional CGI, this section explains the reasons to choose Servlet as web extension instead of CGI. In part five I will describe how servlet works. Here, Servlet's advantages are introduced as follows:

- **Efficiency**

With traditional CGI, a new process is started for each HTTP request. If there are N simultaneous requests to the same CGI program, the code for the CGI program is loaded into memory N times. With servlets, the Java Virtual Machine stays running and handles each request using a lightweight Java thread, not a heavyweight operating system process. If there are N simultaneous requests to the servlets, however, there would be N

threads, but only a single copy of the servlet class. Finally, when a CGI program finishes handling a request, the program terminates. This makes it difficult to cache computations, keep database connections open. However, servlets remain in memory after servlets are started, even after they complete a response, so it is straightforward to store arbitrarily complex data between requests.

- **Convenience**

Servlets have an extensive infrastructure for automatically parsing and decoding HTML form data, reading and setting HTTP headers, handling cookies, tracking sessions, etc.

- **Powerfulness**

Servlets support several capabilities that are difficult or impossible to accomplish using regular CGI. Servlets can talk directly to the web server, whereas regular CGI programs cannot, at least not without using a server-specific API. Communicating with the web server makes it easier to translate relative URL into concrete path names, for instance. Multiple servlets can also share data, making it easy to implement database connection pooling and similar resource-sharing optimizations. Servlets can also maintain information from request to request, simplifying techniques like session tracking and caching of previous computations.

- **Portability**

Servlets are written in the Java programming language and follow a standard API. Consequently, servlets written for, say, Enterprise Server can run virtually unchanged on

Apache, Microsoft Internet Information Server (IIS), IBM WebSphere, or StarNine WebStar.

- **Security**

One of the main sources of vulnerabilities in traditional CGI programs stems from the fact that it is often executed by general-purpose operating system shells. So the CGI programmer has to be very careful to filter out characters such as back quotes and semicolons that are treated specially by the shell. This is harder than one might think. A second source of problems is the fact that some CGI programs are processed by languages that do not automatically check array or string bounds. So programmers who forget to do this check themselves open their system up to deliberate or accidental buffer overflow attacks. Servlets suffer from neither of these problems. Even if a servlet executes a remote system call to invoke a program on the local operating system, it does not use a shell to do so. And of course array bounds checking and other memory protection features are a central part of the Java programming language. A server can further protect itself from servlets through the use of a Java security manager.

- **Elegance**

Servlets code is clean, object-oriented, modular, and amazingly simple. One reason for this simplicity is the Servlets API itself, which includes methods and classes to handle many of the routine chores of servlets development. Even advanced operations, like cookie handling and session tracking, are abstracted into convenient classes.

2.2.2 JDBC

JDBC (Java Database Connectivity) is an Application Programming Interface (API) that is industry standard for database-independent connectivity between the java programming language and a wide range of databases. It consists of a set of classes and interfaces written in Java that allow the programmer to send SQL statement to a database server for execution and in case of Sql query to retrieve query results.

Why did I use Servlets and JDBC to develop the CMS web application? Because Servlets, with their enduring life cycle, and JDBC, a well-defined database-independent database connectivity API, are elegant and efficient solution for hooking web sites to back-end databases. So we started working with servlets specifically because of this efficiency and elegance. Writing database applications in Java using JDBC has at least two advantages: 1) portability across database servers and 2) portability across hardware architecture. The portability across database servers is a consequence of the JDBC API. The value of the JDBC API is that an application can access virtually any data source and run on any platform with a Java Virtual Machine. In other words, with the JDBC API it isn't necessary to write one program to access a Sybase database, another program to access an Oracle database, another program to access an IBM DB2 database, and so on. One can write a single program using the JDBC API, and the program will be able to send SQL or other statements to the appropriate data source. The JDBC drivers take care of the server dependencies, and the applications written in Java using JDBC are independent of the database server. The portability across hardware platforms is a result of the Java language; one doesn't have to worry about writing different applications to

run on different platforms. Hence, the combination of Java and JDBC to develop database applications is an ideal match, as it is possible for the applications to be written once and run anywhere.

The Java programming language, being robust, easy to use, easy to understand, and automatically downloadable on a network, is an excellent language basis for database application. What is needed is a way for Java application to talk to a variety of different data sources. JDBC is the mechanism for doing this.

2.3 Operation of CMS

Conference Management System allows users to interact with the system via Internet. Server program, running on web server before any client program starts, acts as middle layer between a request coming from a Web browser or other HTTP client and database. When a user types a URL on a address line, follows a link from a Web page, or submits an HTML form, a browser generates the GET or POST request for the web pages. The server will read any data sent by the user and look up any other information about the request that is embedded in the HTTP request. This information includes details about browser capabilities, the host name of the requesting client, and so forth. When server receives the data from the client, it will generate the results. This process may require talking to a database or computing the response directly and then format the results inside a document. In most case, this involves embedding the information inside an HTML page. Before sever sends the document back to the client the appropriate HTTP response parameters must be set. This means telling the browser what type of document is being

returned (e.g., HTML), setting caching parameters, and other such tasks. Finally server sends the document back to the client. In most cases, this document may be sent in text format (HTML).

In this project, Java language is chosen. Servlets and JDBC are all written in the Java programming language and follow a standard API. The cross-platform nature of Java is extremely useful for the CMS server running various flavors of the Unix and Windows operating systems. Java's modern, robust, secure, easy to use, object-oriented, memory-protected design allowed me to cut development cycles and increase system reliability. In addition, Java's built-in support for networking and enterprise APIs provides access to legacy data, easing the transition from older client/server systems. This made the CMS system easy to change. Also the combination of the Java platform and JDBC technology makes disseminating information easy and economical. CMS can continue to use their installed database and access information easily even if it is stored on different database management systems or other data sources. From the above introduction, we can see using Servlets, JDBC and Java makes CMS system more powerful, efficient, portable, safe and flexible.

3 System Requirement Definition and Specification

3.1 Product Requirement

Conference management, especially for large international academic conferences, is a quite complicated task and needs a lot of human resource input. The people involved in a conference generally include authors of papers, program committee, general chair etc. The conference management system needs to provide a variety of functions that manipulate input, output and modification of information in the system. Moreover, the system should be able to support multi-user concurrent access and has distinct interfaces for the different tasks.

The users of the system are divided into three groups according to their privilege levels:

- Author
- Program Committee (PC) member
- General Chair (GC)

3.2 Functional Requirements Definition and Specification

3.2.1 Paper Submission

Paper registration is for the paper's authors. Through it authors can submit papers and other information to the server. The following are the service provided:

- Submission

Paper information ---paper title, paper file name, paper's abstract.

Authors information ---author name, author title, author's email.

- Uploading Paper File

Choose a paper file and upload it.

- Input

Authors input their name, title, email and paper 's title, abstract, and submit the file.

- Output

When an author clicks the Submit button, a new window will popup, which acknowledges the information the author has entered. This window also contains a form that allows the author to enter the co-author information (see figure 3-2). If the paper was written by only one author then the author can click the 'Finish' button to finish the input.

The screenshot shows a web browser window with the address bar displaying "http://localhost:8080/servlet/PaPageServer". The main content area is titled "Paper Registration" and contains the following text: "Please fill in the following information and choose the file. The file must be named according to the CFP." Below this text are several input fields: "Author Name:", "Author Title:", "Author Address:", "Email Address:", "Paper Title:", "Paper Abstract:", and "Paper File Name:". A "Browse..." button is located to the right of the "Paper File Name" field. Below the input fields, there is a section titled "please choose the topics of your paper. Use 'Ctrl' key to select multiple items". This section contains a list box with the following items: "Access Methods and Data Structures", "Active Databases", "Authorisation and DB Security", "Concurrency Control and Recovery", "Constraint and Rule Management", "DBMS Architecture", and "Data Mining and Knowledge Discovery". At the bottom of the form, there are two buttons: "Submit" and "Reset".

Figure 3-1 Paper Registration

The image shows a screenshot of a web browser window. The address bar contains the URL: `http://localhost:8080/servlet/PaCoAuthorPageServer?palD=7`. The page content includes the following text: "Please fill in the following information for your co-author(s). if no co-author please click finish." Below this text are four input fields: "Co-Author Name:", "Co-Author Title:", "Co-Author Address:", and "Co-Author Email:". At the bottom of the form are three buttons: "Submit", "Reset", and "Finish". The browser's status bar at the bottom shows "Done" and "Local intranet".

Figure 3-2 Co-Author Information

3.2.2 PC Workstation

This service is provided for the Program Committee (PC) member. A valid ID and a password are required to access the site. The page provides the following services:

- PC Registration
- PC Download File
- PC Review
- Input
- Output

When a PC member chooses an option, a new window will pop up, which contains the page linked by the option.

- Constraints

All these options can be accessed only by PC member and GC.

Each task for the PC member is explained as follows:

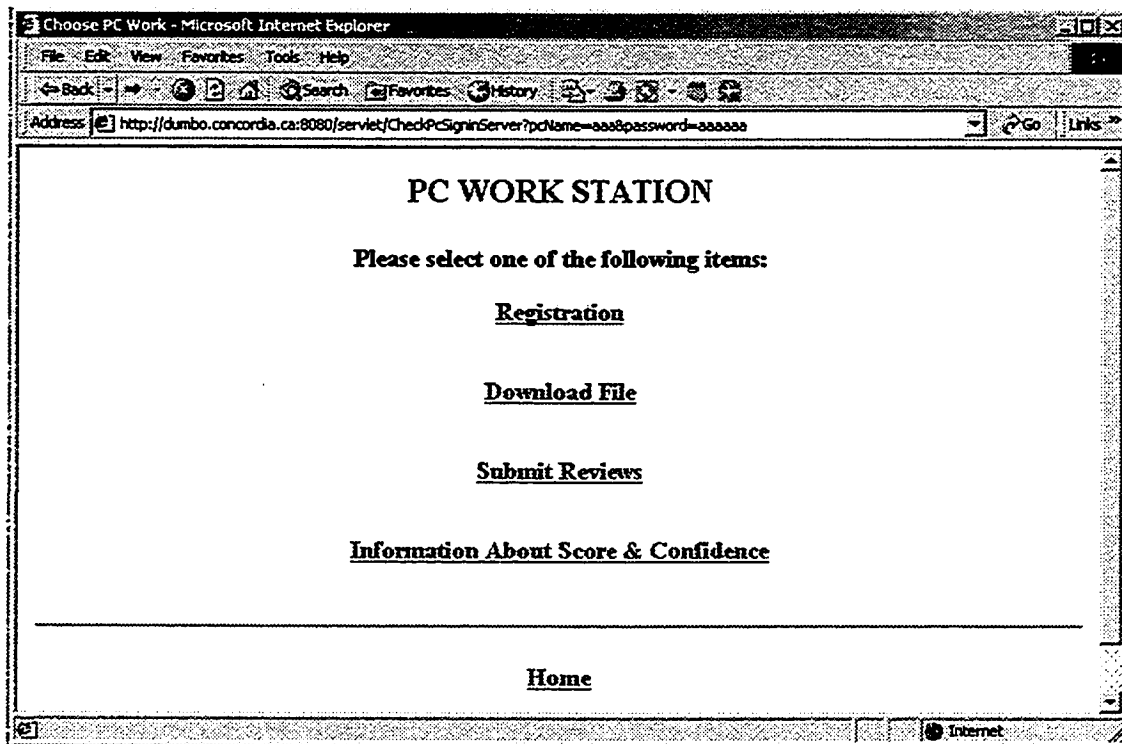


Figure 3-1 PC Workstation

Registration by PC member

The services provided to PC member are:

- Enter user's information for the system.
- Input

Input user's ID number, name and organization into the form.

- Output

When an user clicks the Submit PC member Information button, a new window will pop up, which acknowledges the information entered.

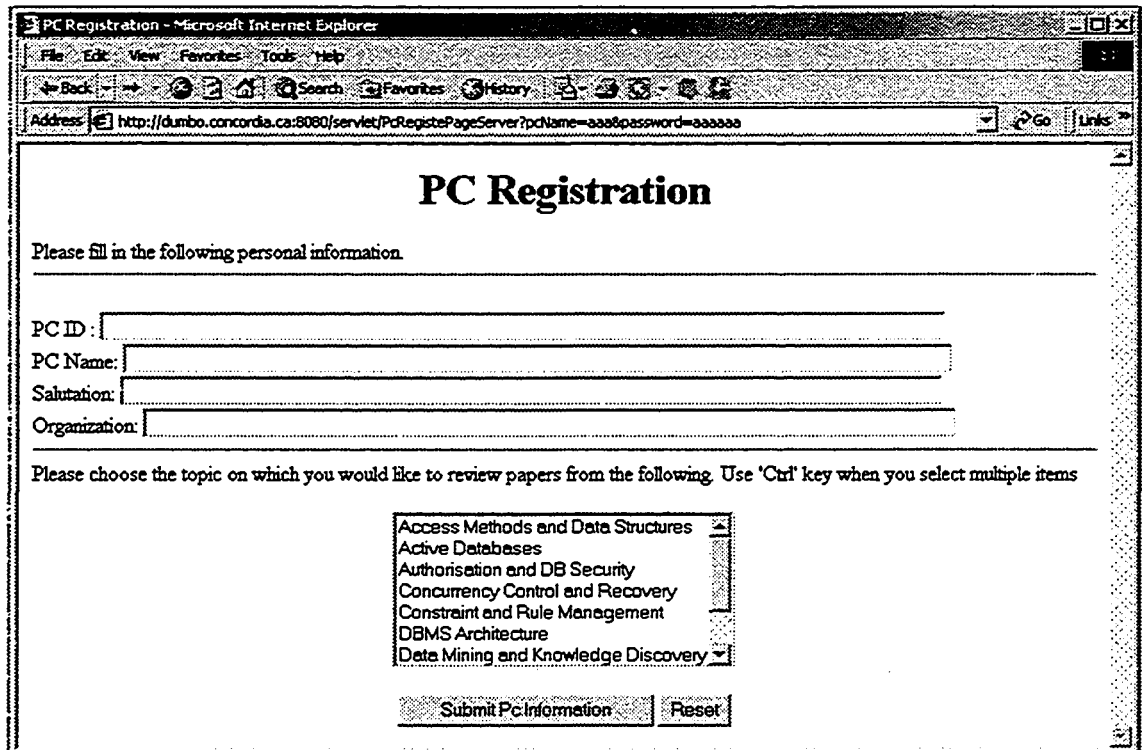


Figure 3-2 PC Registration

Download File by PC member

From this page PC member can download all the files to be reviewed. The services provided are:

- Show all the topics of interest to the PC member and all the files to be reviewed.

- Input

User can click on one of the files to download it.

- Output

Show the files that can be downloaded.

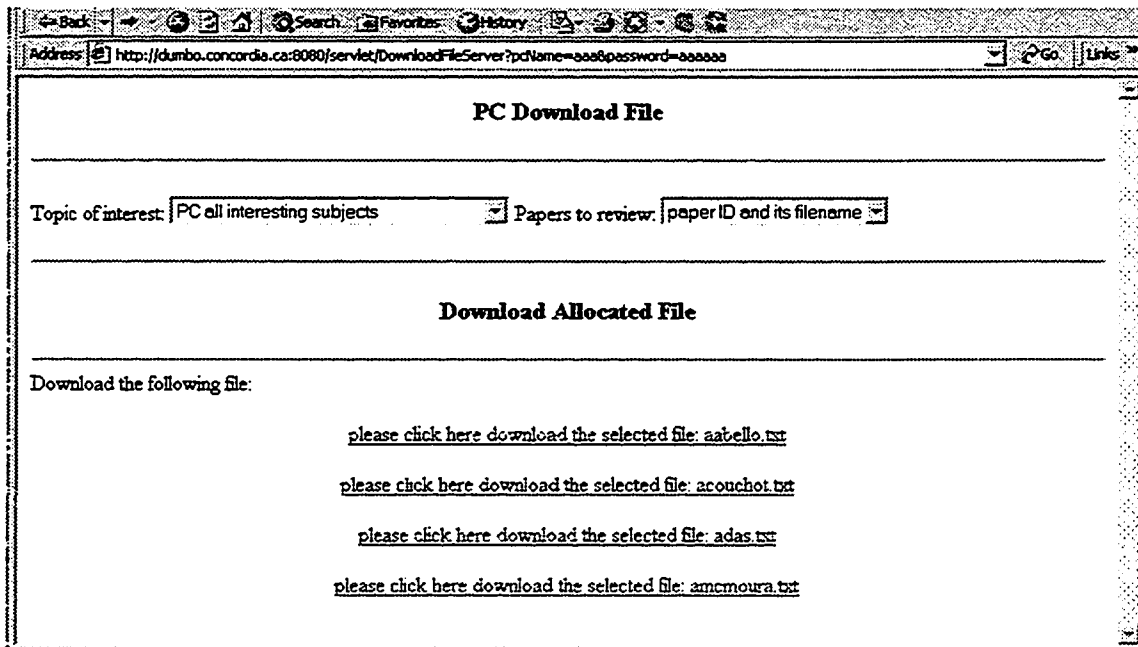


Figure 3-3 PC download file

Review by PC member

This web page provides the following:

- Input the information about each paper: the score, confidence and evaluation of the papers that is reviewed by the PC member.
- Input

PC member has to input paper's score, confidence and evaluation to the form.

Information about Score and Confidence

The service provided PC member information about how to give the score and confidence of the reviewed papers.

Back Search Favorites History

Address <http://dumbo.concordia.ca:8080/servlet/PcReviewPage1?pcName=aaa&password=aaaaaa> Go Links

PC Review

Please select the paper in the pull down menu before entering the Score and Confidence level, press Add Comments button to enter your comments for the paper.

Select paper reviewed

The Score is from 0-10 and the Confidence is from 0-4

Paper Score:

Confidence:

Figure 3-4 PC Review page 1

Back Search Favorites History

Address <http://dumbo.concordia.ca:8080/servlet/PcReviewPage2?pcPassword=aaaaaa&palIDAndFileName=1++aabello.txt&score=9&confidence=3.8> Go Links

PC Review

Enter the Comment in the following:

PAPER: 1 FILE: aabello.txt TITLE: Understanding Analysis Dimensions in a Multidimensional Object-Oriented Model

To Author:

To Chair:

Figure 3-5 PC Review page 2

3.2.3 GC Workstation

This service is for the general chair (GC). A Valid ID and a password are required for accessing this page. The services includes the following:

- Input data
- Send Email
- Allocate papers
- Examine paper's reviews
- Output

When the GC chooses an option, a new window will pop up, which contains the page corresponding to the option.

- Constraints

All the options are accessible only to the GC.

Each task the GC does is explained as follows:

Input Data

This service for GC manipulates the database and put information directly into the database. The services include the following:

- Create the database elements such as tables
- Input PC member information
- Input Topic Name of the conference
- Update GC name, password, and email address
- Output

Whenever GC finishes a task the corresponding feedback information will be displayed.

The screenshot shows a web browser window with the address bar containing the URL <http://dumbo.concordia.ca:8080/forms/GcInputPcInfo.html>. The page title is "PC Information Input". Below the title, there is a horizontal menu with six buttons: "DropTable", "CreatTable", "InsertAllTestTable", "InsertRealTable", "PrintAllTable", and "InsertPcRevToAuGc". Below this menu, there is a text prompt: "Enter PC name_ID, password and email". This is followed by four input fields: "PC ID No.", "PC Name:", "Password:", and "PC Email:". At the bottom of the form, there are three buttons: "SubmitPcInformation", "UpdatePcInformation", and "Reset".

Figure 3-1 PC Information Input

The screenshot shows a web browser window with the address bar containing the URL <http://dumbo.concordia.ca:8080/forms/GcInputSubInfo.html>. The page title is "Subject Input". Below the title, there is a text prompt: "Please input topic in the following text field." This is followed by a single input field labeled "Topic Name:". At the bottom of the form, there are two buttons: "Enter Topic" and "Reset".

Figure 3-2 Subject Input

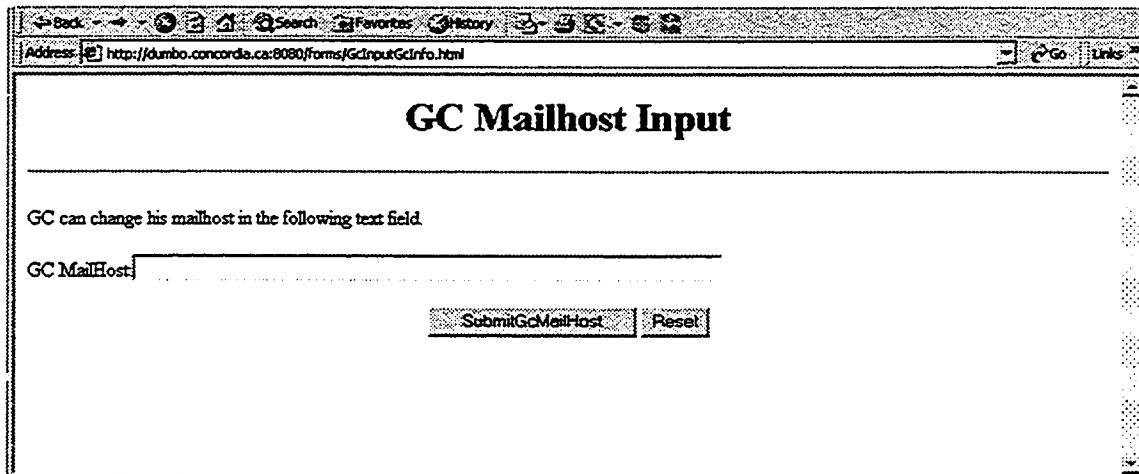


Figure 3-3 GC information Input

Send Email

This service allows the GC to send many types of email automatically. The services include the following.

- Send an email to PC members – giving their ID and password
- Send a message to PC members to remind them to submit topic of interest
- Send a message to PC members (who have not submitted all the reviews) to remind them to submit review for papers
- Send a message to authors
- Input

For each email to be sent some related information must be input as instruction.

- Output

Whenever GC finishes some task the corresponding feedback information will be displayed.

Back Search Favorites History

Address <http://dumbo.concordia.ca:8080/forms/GcSendEmail.html> Go

Send Email

Before sending email GC has to make sure that mailhost has been entered.

From:

Subject:

Message:

SendPc RemindSubmitSubject RemindSubmitReview SendAllPaperResultToAuthor

Figure 3-4 Send Email

Allocate Paper

This service allows GC to automatically allocate paper among the PC members. This service includes the following.

- Choose allocate rule
- Allocate paper
- Delete allocated paper from a given PC member
- Choose a new 'At Least' and 'At Most' parameters values to Reallocate paper
- Show all tables in the database
- Input

Before starting allocate, GC must input the lower and upper number of papers that PC members review.

- Output

Whenever GC finishes some task, the corresponding feedback information will be displayed. For some papers that cannot be allocated, the related information will be displayed.

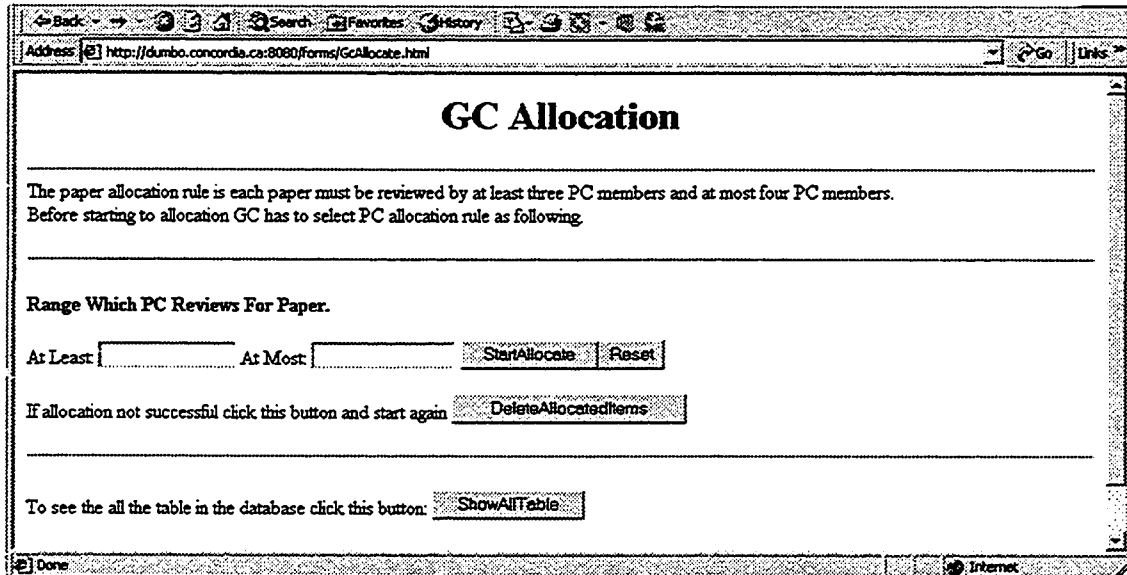


Figure 3-5 Allocate Paper

Examine Paper's Review

This service allows the GC to see the reviews written by PC members and allows GC to add his own review for authors. The services include the following.

- Show overview of all papers
- Submit GC comments to the database
- Input

GC has to input the each paper's review result to the form and then send it to the authors.

- Output

When GC click the button 'show overview all paper information', then all the paper', (What happens next?)

The screenshot shows a web browser window with the address bar containing the URL `http://dumbo.concordia.ca:8080/forms/GcReview.html`. The main content area is titled "Program Chair Decision". Below the title, there is a horizontal line followed by the text: "Please enter your decision and combine the content of review to author written by Pc together with the following text. Before entering your decision you must first enter the paper ID number." Another horizontal line follows. Below this, there is a "Paper ID:" label next to a small text input field. To the right of this is a large, empty text area for the "Decision:". Below the decision area are two buttons: "SubmitGcDecision" and "Reset". At the bottom of the form, there is a line of text: "You click the right button to show a total overview of all paper:" followed by a button labeled "ShowOverviewOfAllPaper".

Figure 3-6 Review Paper

3.3 Non-Functional Requirements

Non-functional requirements define system properties and constraints. The properties, for example, are reliability and response time. An example of constraints is the capability of the I/O device attached to system and the data representation used by other systems connected to the required system.

The non-functional requirements of CMS can be classified into three categories: product requirement, organization requirement and external requirement.

3.3.1 System Requirement

Computer Hardware and software requirements

The system should perform all its functionality efficiently on the following platforms:

Web server: any web server that supports Java Servlets

Operating system: Windows NT/Window 98/Linux

Servlet Software: JSWDK

(<http://java.sun.com/products/servlet/download.html>)

File Upload Program: com.oreilly.servlet package

(<http://www.servlets.com/resources/index.html>)

DBMS (Database Management System): MySql

End user:

In general, any computer, which can use graphical web browser through the Internet, can access the system.

Performance Requirements

The system should support user to access the servlets concurrently and allow many users access at the same time. System should work correctly and efficiently. The number of users is restricted by database management system and operating system.

4 System Design

4.1 Design Rationale

The characteristics of Conference Management System application includes

- Web based application

The main users of the CMS system, PC members, GC and authors, apply web browser to exchange conference relevant information through internet/intranet.

- Client/server model

The clients of CMS system are distributed worldwide and the physical location of the system server is also separated from the clients. The server should be ready to respond to the clients' request at any time. Server side also supports multi-user access concurrently.

- Implementation of web server and database

CMS system needs web server hosted on World Wide Web and at least one database to store quite large amount of conference information about papers and their abstracts, authors, PC members, etc. It is better to modularize the web server and database separately.

4.2 System Architecture

CMS system applies the Three Tier Application Model. It includes

- Front tier - provides presentation services.
- Middle tier - provides business services.
- Back tier – provides data services.

Figure 4-1 illustrates the overview of major components of CMS system architecture.

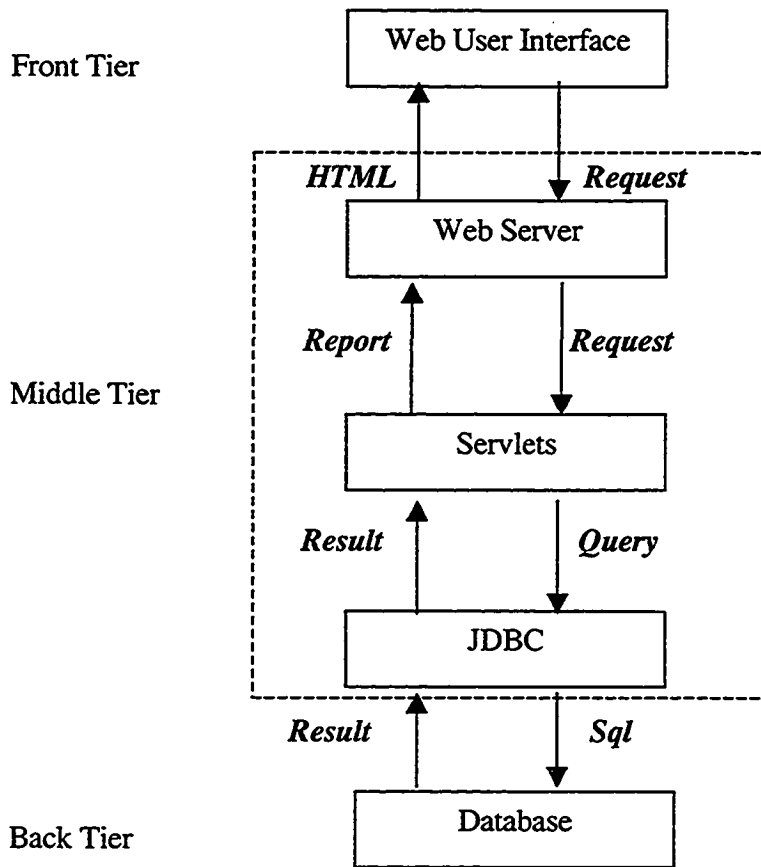


Figure 4-1 Three-Tier Diagram of CMS Architecture

The various components of the system identified by their functions are:

- **Web User Interface:** This is the front tier of the system that uses HTML format to provide system users the graphical user interface. It performs functions of displaying message, inputting request, downloading/uploading files and so on.
- **Web Server:** This is a host of HTML files. It accepts the request from the users, communicates with servlets and responds to the requests with information using HTML or through servlets.

- **Servlets:** This is the central part of the middle tier that integrates the core functions of the whole system, such as request/response mechanism, information processing algorithms, and generating data operation commands to the data module in the back tier. They also respond to and process events from web server.
- **JDBC:** It provides internal interface between servlets application programs and Database.
- **Database:** Stores and manages the system information.

According to the above three-tier model, CMS system is divided into three subsystems: user interface subsystem, server subsystem and database subsystem.

The following figure gives the organization details of the CMS system.

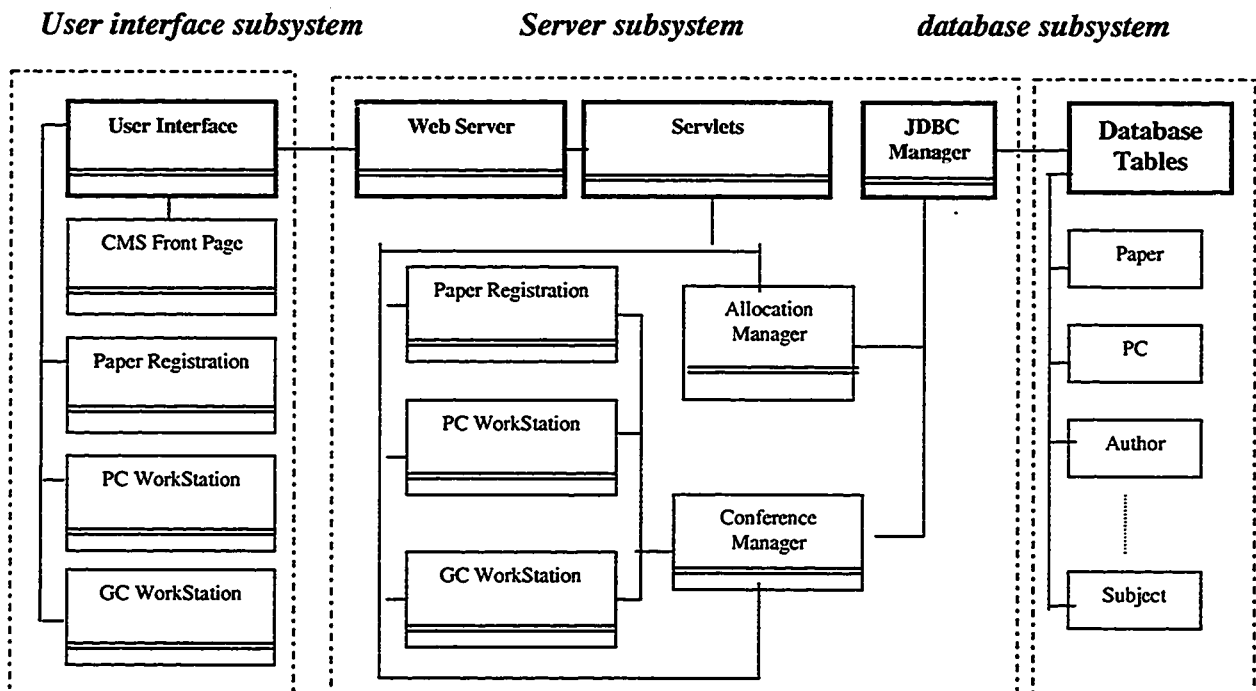


Figure 4-2 Conference Management System Architecture

This section mainly discusses user interface subsystem and server subsystem. Database subsystem will be discussed in the next section.

4.2.1 User interface subsystem

User interface subsystem includes three main components: Paper Registration, PC member WorkStation and GC WorkStation. The main linking hierarchy of the HTML files is shown in figure 4-3.

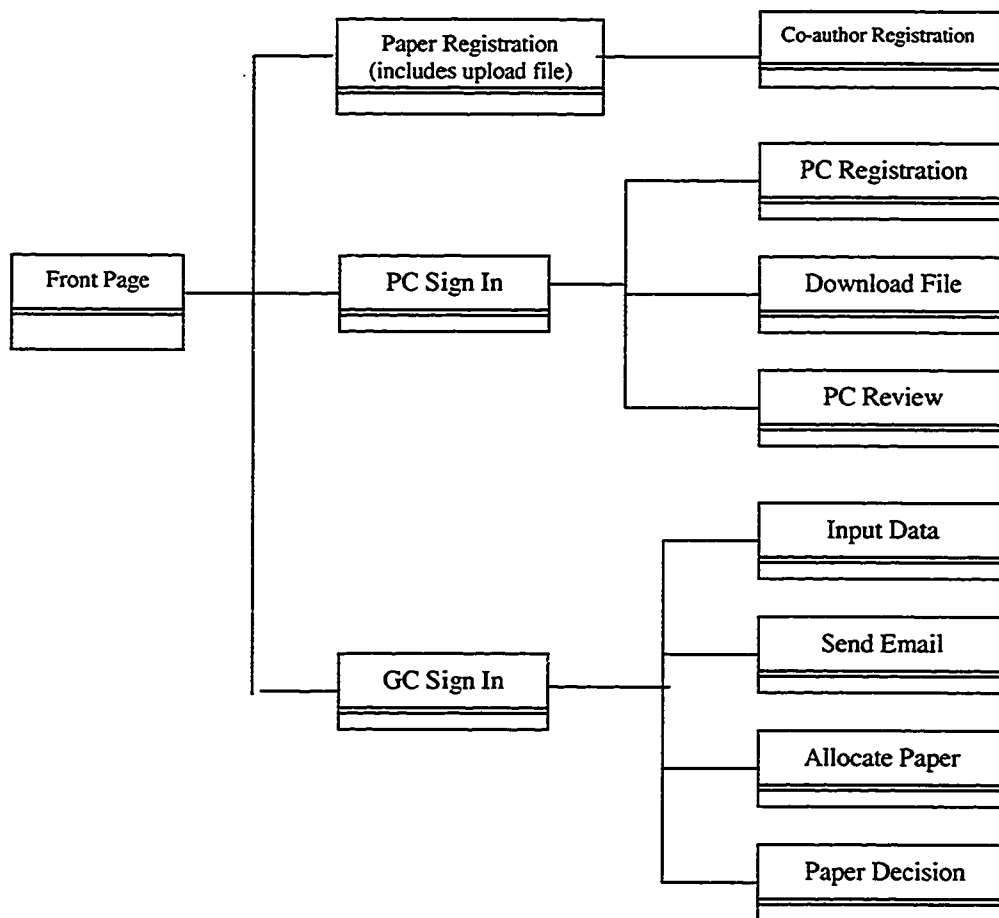


Figure 4-1 Interface Subsystem

4.2.2 Server subsystem

Server subsystem consists of three sections: web server, servlets and JDBC. Figure 4-4 displays its component details.

Servlets is responsible for handling user input, which includes interpreting user input and passing information and instruction between the web server and JDBC within server subsystem. When a client sends a request to the web server, it dispatches a request to a servlet by invoking the servlet 's doGet() or doPost() method to handle the event. When a client needs to retrieve some information from the database, the servlets sends a request to the database subsystem, and then transfer the required data to the user interface subsystem through web server. So in server subsystem servlets play a key role on the server side.

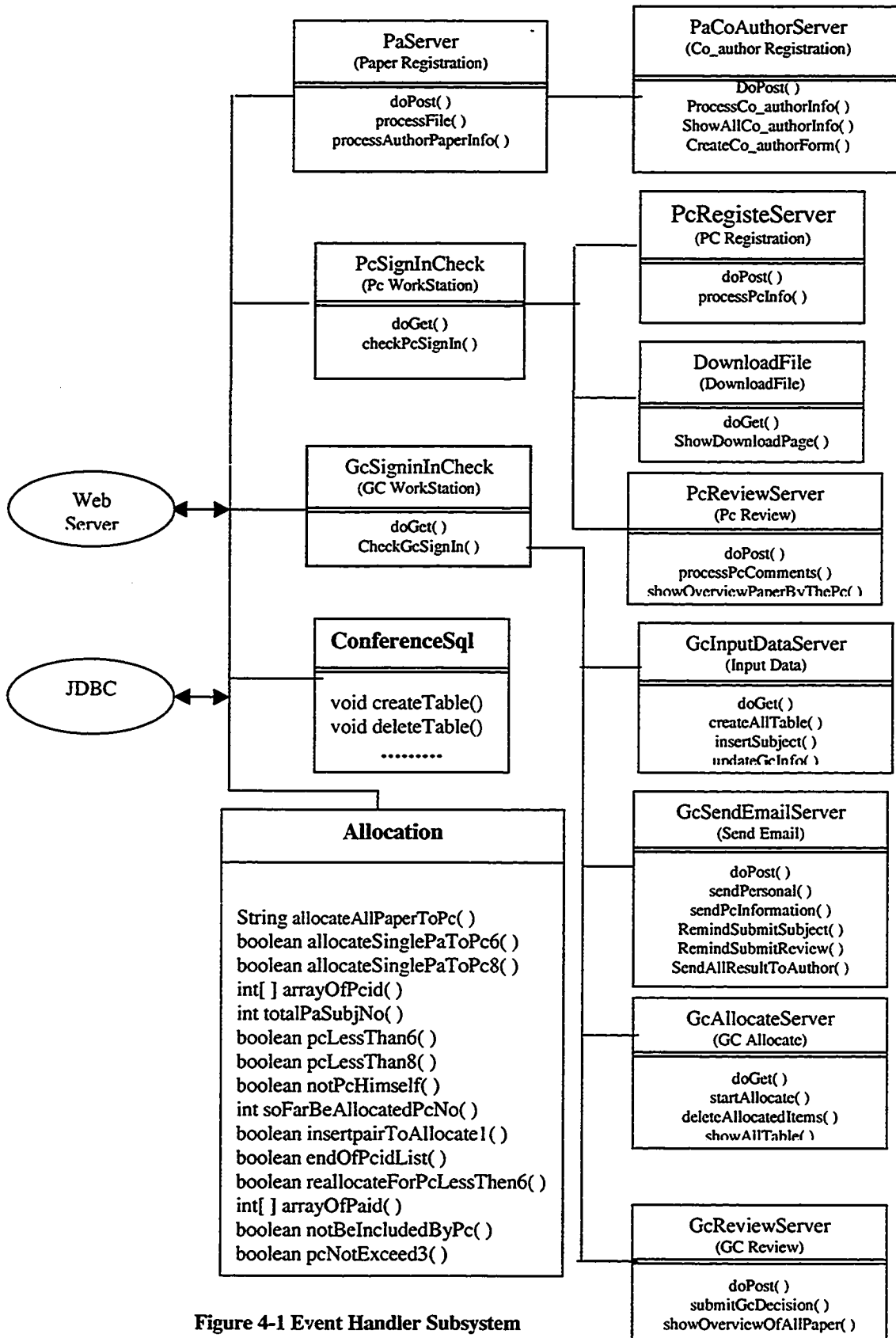


Figure 4-1 Event Handler Subsystem

4.2.2.1 Internal module description

Paper Registration

- `createPaperPage()`: creates a page and lets authors register their papers and other information.
- `createSubjectListBoxInPaperPage()`: creates a list box of topics in the paper page.
- `processFile()`: checks whether file name is duplicated, and if not, stores the file and displays information for the file to the author.
- `processAuthorPaperInfo()`: receives data from the author and stores it in the database. Then displays the feedback information to the author.
- `processCo_authorInfo()`: checks input data and stores the co-author information to the database.
- `showAllCo_authorInfo()`: displays all the authors information for the submitted paper.
- `createCo_authorForm()`: creates a form to input co-author information.

PC WorkStation

- `checkPcSignIn()`: checks PC member's password and name.
- `createPcRegistePage()`: creates a page for PC member to register information.
- `processPcInfo()`: gets the PC member input information and stores it to the database.
- `showDownloadPage()`: creates a list of file which can be downloaded by the PC members.
- `pageForScoreAndConf()`: creates a page for PC member to enter paper's score and confidence in the corresponding fields.

- `createPcCommentsPage()`: creates a page to let PC member input the paper's comments on it and obtains the paper's score and confidence before storing them into the database.
- `processPcComments()`: receives the PC member's comments before storing them into the database.
- `showOverviewPaperByThePc()`: displays the information of the papers PC member reviewed.
- `showPcComments()`: displays comments made by the PC member.

GC WorkStation:

- `checkGcSignIn()`: checks GC's password and name.
- `createAllTable()`: creates all the tables in the database.
- `submitPcInfo()`: receives PC member's information and then store them into the database.
- `insertSubject()`: extracts the topic from the web page then stores into the database.
- `updateGcInfo()`: update the GC's information in the database.
- `sendPersonal()`: sends emails.
- `sendPcInformation()`: sends a password and ID number to the PC members.
- `remindSubmitSubject()`: sends an email to PC members who haven't submitted topics of interest.
- `remindSubmitReview()`: sends an email to PC members who haven't submitted their reviews.

- `sendAllResultToAuthor()`: sends an email to all authors about result of paper's review.
- `startAllocate()`: assigns papers to PC members according to some rule.
- `deleteAllocatedItems()`: deletes all allocated items in the database.
- `showAllTable()`: on the web page, displays all the tables in the database.
- `submitGcDecision()`: stores the GC's evaluation of the paper into the database.
- `showOverviewOfAllPaper()`: displays all the information for all papers on the web page.

Allocation:

- `allocateAllPaperToPc()`: assigns all the papers to the PC members according to some rule.
- `allocateSinglePaToPc6()`: assigns one paper to the PC members according to some rule.
- `arrayOfPcid()`: finds out array of pcid which contain topics that the paper contains.
- `totalPaSubjNo()`: finds out total topic number that the paper has.
- `pcLessThan6()`: checks whether the number of papers that PC member was allocated is less than the value of parameter `pcAtLeasetReviewPaNo`.
- `pcLessThan8()`: checks whether the number of papers that the PC member was allocated is less than the value of parameter `pcAtMostReviewPaNo`.
- `notPcHimself()`: check whether the author of the paper is the PC member who is going to be allocated for the same paper.
- `soFarBeAllocatedPcNo()`: finds out number of PC member the paper was allocated.

- `insertPairToAllocate()`: inserts allocated pair of “paid” and “pcid” to the table which allocates and increments ‘total_pa’ and ‘total_pc’ variables respectively.
- `endOfPcidList()`: checks whether the array of pcid reaches the end.
- `reallocateForPcLessThen6()`:reallocates papers to the PC member, whose allocated number of paper is less than the value of parameter `pcAtLeaseReviewPaNo`.
- `arrayOfPaid()`: finds out the array of paper IDs that contain the topics the PC member has.
- `notBeIncludeByPc()`: finds out papers which have been allocated to the PC member.
- `pcNotExceed3()`: checks whether the paper’s allocated total PC member number is less than 4.

ConferenceSql:

All the method names of this class indicate their functions directly.

4.3 System data flow

The previous section describes the static picture of what CMS system and its components include. This section will explore how the data or message moves within CMS system and the interactions between its subsystems and subsystem components in the instance of different user task scenarios.

4.3.1 Paper Registration Scenario

When a user selects the Paper Registration option, the browser generates a request and sends the request to the server. Then the web server dispatches a request to a servlet,

PaPageServer, which is a java class (Figure 4-5). The web server invokes doGet() method of PaPageServer class with parameters of an object of HttpServletRequest class and an object of HttpServletResponse class. The doGet() method will call createPaperPage() method of the same class to create the paper register page for authors to register paper and input information. Also createSubjectListBoxInPaperPage() method is invoked to create a paper topic list to let authors choose the topics of the paper.

After filling out the form, the author clicks the submit button, another servlet, PaServer's doPost() method is called and again, this doPost() method invokes the processFile() method to accept the data and uploaded file from the author and saves it to the conference database. At last, the processFile() displays the received information to the author.

On another page, there is a form to input co-author information. The author will enter all these co-authors information. The co-authors information will also be stored in the database by invoking the methods of ConferenceSql class.

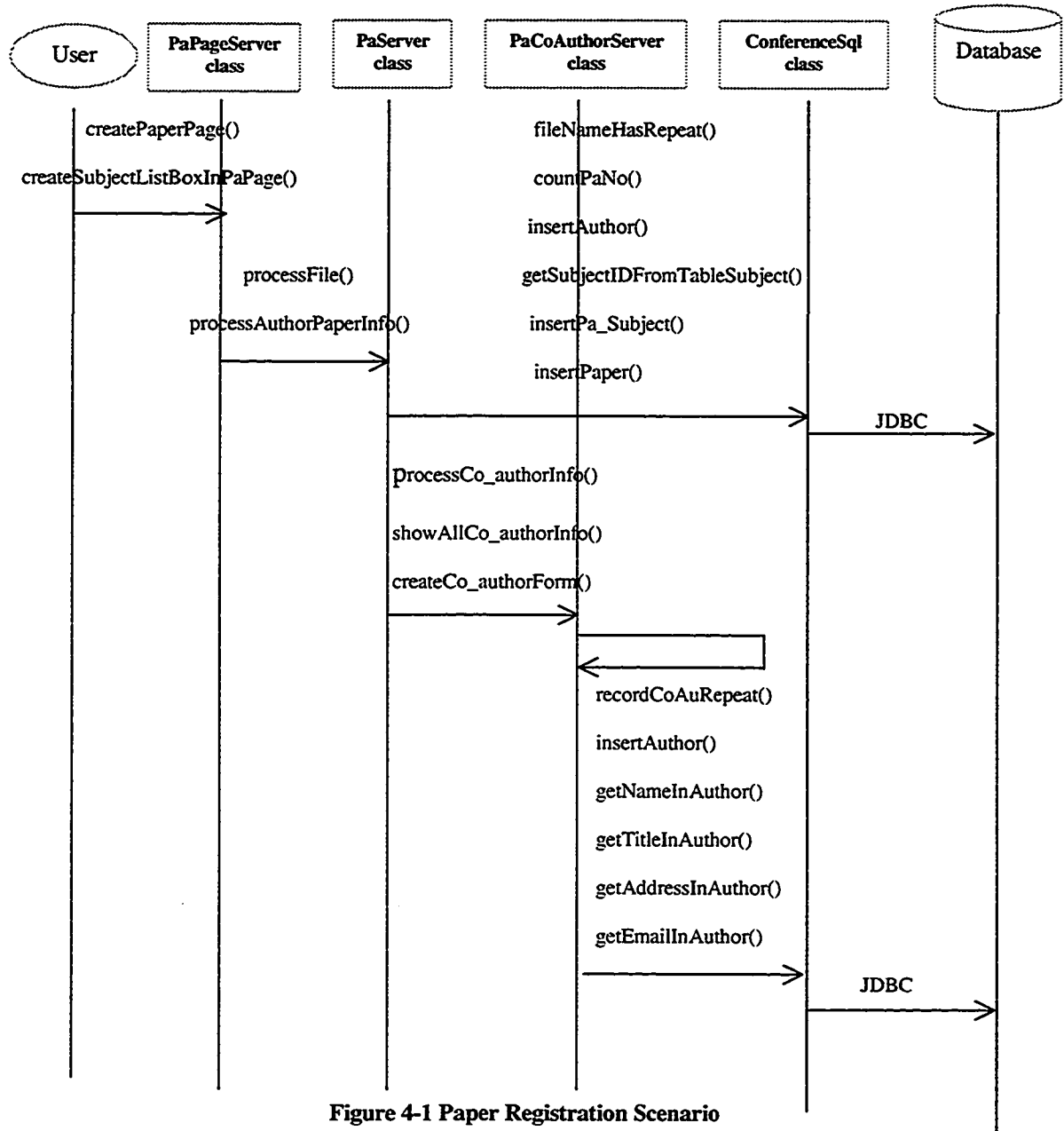


Figure 4-1 Paper Registration Scenario

4.3.2 PC WorkStation Scenario

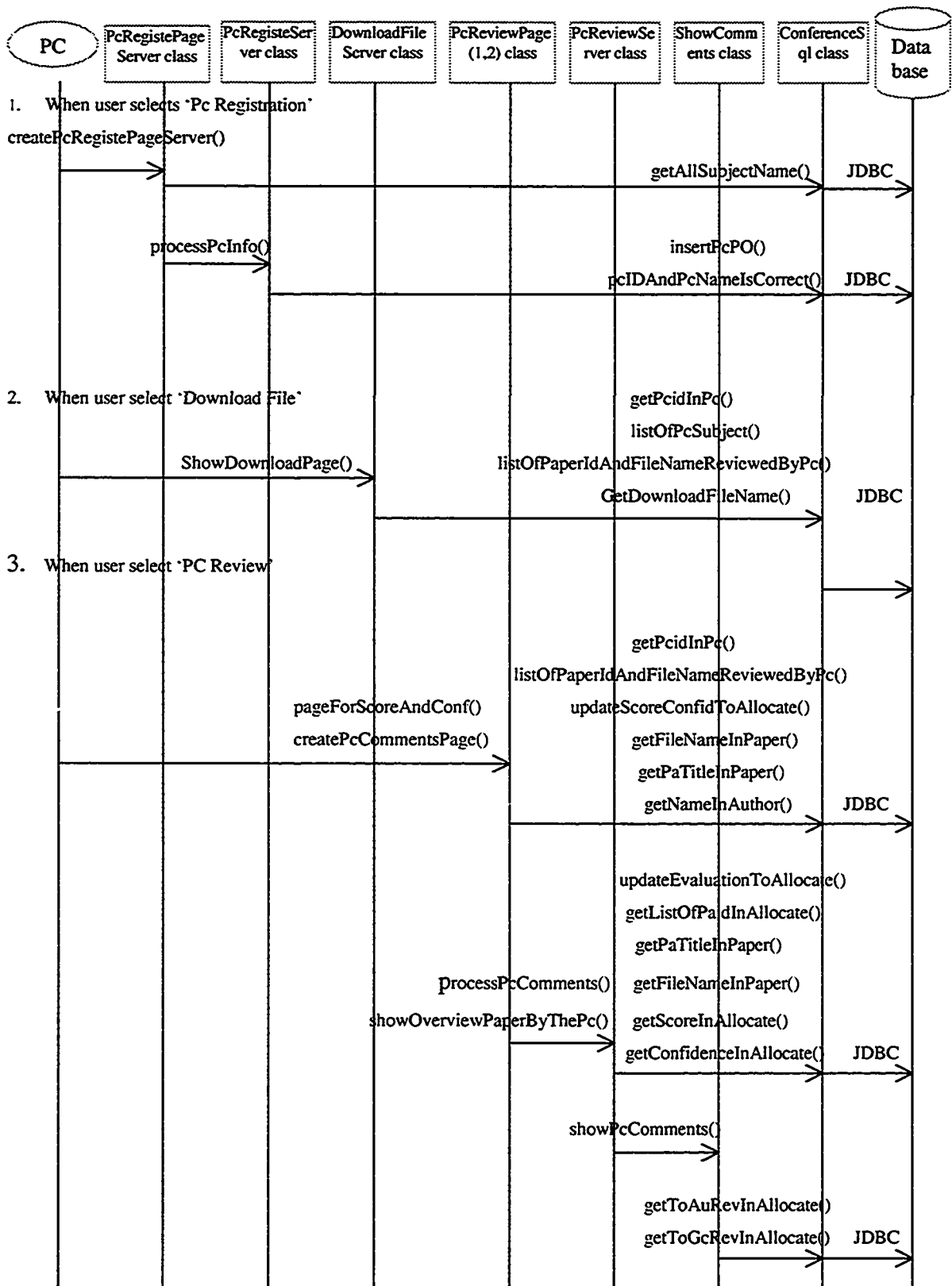


Figure 4-1 PC WorkStation Scenario

The user who selects the PC WorkStation option must first login with correct username and password before entering the PC working environment. Once the user provides the username and password and clicks the 'sign in' button, the servlet, CheckPcSigninServer class, is invoked to check the username and password. The next page will display only when the correct username and password is input.

When PC member selects the 'PC Registration', an object of PcRegistePageServer class is called to create a web page to let PC member enter his/her personal information. After 'submit Personal information' button is clicked, an object of PcRegisteServer class is invoked to deal with PC member's information. This process includes receiving, storing and displaying data for the PC member by invoking processPcInfo() method of PcRegisteServer class.

When PC member select the 'Download File' option, an object of DownloadFile class is invoked to display the file names of paper that are to be reviewed by the PC member, the topics of interest for the PC member, and all files which can be downloaded by the PC member.

When PC member selects the 'PC Review' option, an object of PcReviewPage1 class is invoked. When PC member submits the paper's score and confidence, another web page which is to let PC member continues to enter comments on the paper. After that the object of PcReviewServer class will invoke the processPcComments() method to receive and store it in the conference database. If PC member clicks the

'showOverviewPapaByThePc' button, all the information such as scores and evaluation for all papers reviewed by the PC member will be displayed.

4.3.3 GC WorkStation Scenario

Like PC WorkStation, GC WorkStation option also has username and password check enforced by CheckGcSigninServer class.

When GC selects the 'Input Data' option, server will invoke GcInputDataServer's doPost() method. In this method, it calls createAllTable() method to create all conference tables in the database. It also calls method insertPcInfo(), inserSubject() and updateGcInfo() to let GC update database. Method insertPcInfo() inserts PC member's organization information to database; method inserSubject() inserts available topics of the conference to the topic table; method updateGcInfo() lets GC change his own username, password, organization and email address.

When GC selects 'Send Email' option, server will invoke GcSendEmailServer class to let GC set some parameters and automatically create the email text to be sent. It calls sendPersonal() method to send email to a specific person. It calls method sendPcInformation() to send PC members email to inform PC members of their PC ID number and password. It calls method remindSubmitSubject() and remindSubmitReview() to send email to reminds PC member submit her/his topics and paper's evaluations. It calls method sendAllResultToAuthor() to send email to all the authors who had submitted a paper through the conference system's web pages.

When GC selects 'Allocate Paper' option, sever will use GcAllocateServer class to assign the papers to member of the PC. If allocation is not successful, click the 'deleteAllocatedItems' button and deleteAllocatedItem() method is called. Then you can type in another group of parameters to reallocate. This web page also provides a 'ShowAllTable' button which will display all the tables in the database.

When GC selectst the 'Review Paper' option, server will invoke servlet GcReviewServer class's doPost() method. After finishing the paper's evaluation, GC clicks the button 'submitGcDecision' to call the method submitGcDecision to store the information to the database. Also GC can click the 'ShowOverviewOf AllPaper' button to see all the papers's ID number, title, file name, all the scores and confidences of specific paper, and the PC member's evaluation.

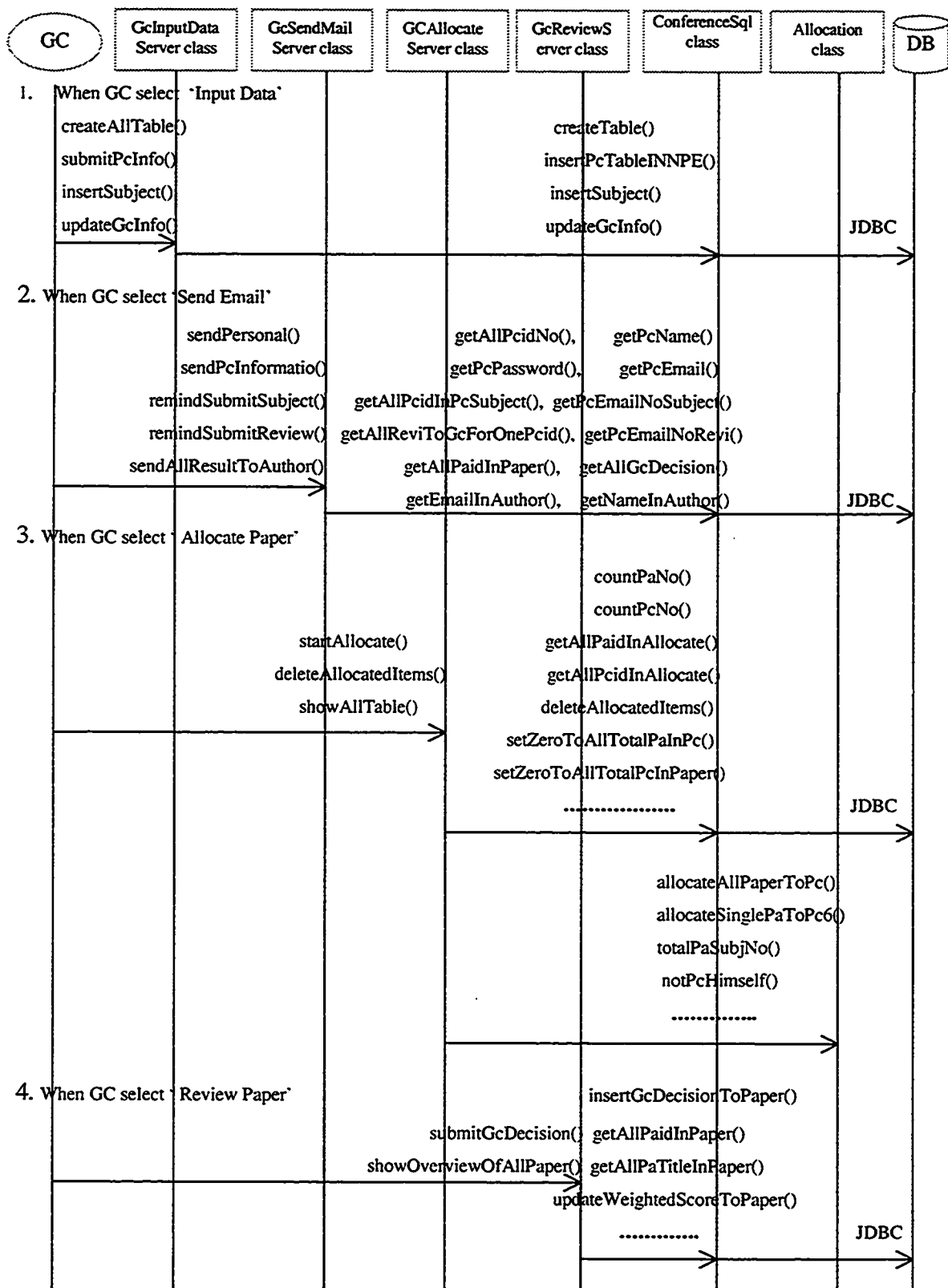


Figure 4-1 GC Workstation Scenario

5 Database Design

An effective information system must provide users with timely, accurate, and relevant information. There are alternative ways of organizing data and representing relationships among data in the database. Despite the use of excellent hardware and software, designing of database and choice a suitable database management system to launch and manipulate the operations on the database are also critical issues.

5.1 Selection of Database Model

Ralational data model is currently a dominant database model in use. This model represents all data in the database as two-dimentional tables called relations. The relational data model presents a logical view of a database. This is a simple and intuitive view of data that hides all the complex details of how the data is actually stored and accessed within a computer. The information in more than one table can be easily extracted and combined using DBMS providing language.

5.2 Selection of Database Management System

In this project, MySql is chosen as the Database Management system. MySql is one of the relational database management systems to be used by small to medium applications. It is an implementation of the SQL-92 standard Structured Query Language, a universal language that can be used to define, query, update, and manage a relational database.

5.3 Database Design

5.3.1 Design assumptions

- General Chair is responsible for administrating the Conference Management System and database. GC's ID number is set 1.
- The meeting has more than one topics.
- Each paper may have one or more topics of conference.
- Each paper may be written by one or more authors.
- A PC member cannot review a paper that is written by himself/herself.
- Each paper is to be assigned to a minimum of three and a maximum of four PC members.

5.3.2 Entity-Relationships Diagram

A semantic data model for the logical database design is used here. The ER diagram is showed in Figure 5.1. It clearly shows the entities and their relationships.

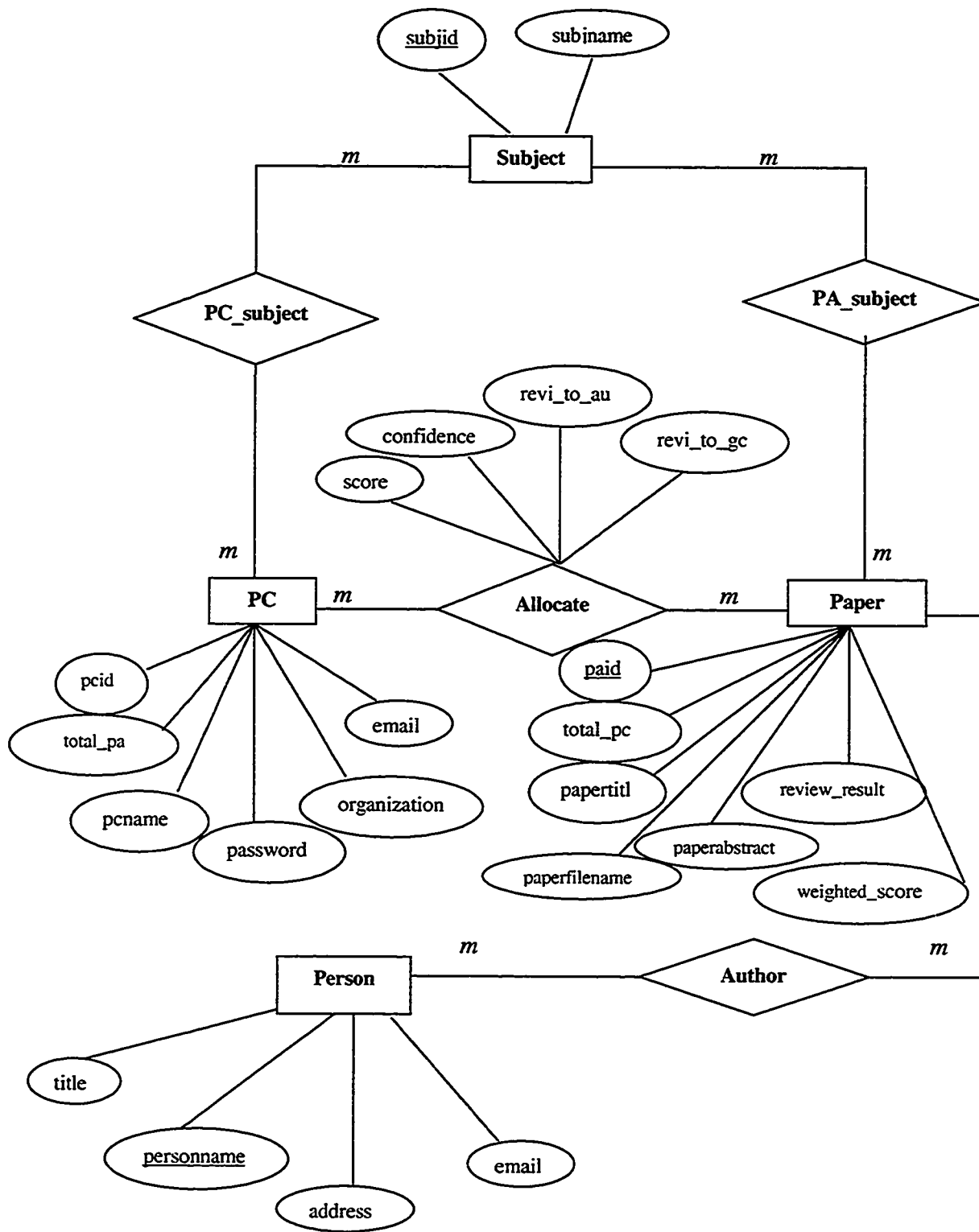


Figure 5-1CMS Entity-Relationships Diagram

5.3.3 Database Schema

Schemas are defined using SQL as followings.

pa_subject (paid:integer, subjid: varchar)

pc_subject (pcid: integer, subjid: varchar)

pc (pcid: integer, total_pa: integer, pname: varchar, password:varchar, organization: varchar, email: varchar)

paper (paid: integer, total_pc: integer, papertitle:varchar, paperfilename: varchar, paperabstract: varchar, review_result: varchar, weithted_score: varchar)

allocate (paid: integer, pcid: integer, score: double, confidence: double, revi_to_au: varchar, revi_to_gc: varchar)

author (paid: integer, authname: varchar, title: varchar, address: varchar, email: varchar)

Subject (subjid: integer, subjname: varchar)

5.4 Data Dictionary

This data dictionary contains the tables including entities and relations, and attributes and their descriptions. It will allow you to understand the database design and database implementation.

Data Dictionary Schema

Table Name*	Attributes***	Description for Attributes****
Description for table**		

- * Name of tables
- ** Description of table
- *** Name of attributes
- **** Descriptions of attributes

Relation Specification	Attributes	Descriptions
pa_subject information about topics each paper has	paid subjid	Paper ID number Topic ID number
pc_subject information about topics each PC member has	pcid subjid	PC ID number Topic ID number

Table 5-1 Data Dictionary (1)

Relation Specification	Attributes	Descriptions
Pc PC member information about name, password, organization and email address and total reviewed paper number.	Pcid total_pa pcname password organization email	PC ID number Paper number which is reviewed by PC member PC member name PC member password PC member's organization PC member's email address

<p>Paper</p> <p>paper information about paid (paper's file name), paper abstract, paper's review result and PC members total number which review the paper and weighted score.</p>	<p>Paid</p> <p>total_pc papertitle paperfilename paperabstract review_result weighted_score</p>	<p>Paper ID number</p> <p>pc number which review the paper</p> <p>paper title</p> <p>paper file name</p> <p>paper abstract</p> <p>the final result of review</p> <p>the final score computed by some rule</p>
<p>Allocate</p> <p>the information about which paper should be reviewed by which PC member and correspond PC member's evaluation to author and GC. Also include the information about paper' score and confidence.</p>	<p>Paid</p> <p>pcid score confidence revi_to_au revi_to_gc</p>	<p>paper ID number</p> <p>PC ID number</p> <p>paper' score made by PC member</p> <p>paper's confidence made by PC member</p> <p>paper's evaluation made by PC member</p> <p>paper's evaluation made by PC member</p>

Table 5-2 Data Dictionary (2)

Relation Specification	Attributes	Descriptions
Author information about author name, title, address, email and paid.	paid authorname title address email	paper ID number author name author title author address author email
Subject information about topics of conference	subjid subjname	Topic ID number Topic name

Table 5-3 Data Dictionary (3)

6 Testing

6.1 Objectives

Software testing is one of the major processes of system development. The objective of testing is to ensure that the system conforms to its requirement specifications (i.e. Software Verification) and the system implementation has met the expectation of the customer (i.e. Software Validation). A successful testing process should systematically uncover different classes of errors in a minimum amount of time and with a minimum amount of effort. It also demonstrates that the software appears to be working as stated in the specifications. The data collected through testing can provide an indication of the software's reliability and quality.

6.2 Testing Methods

I selected two stages of testing process, that is, Unit testing and Integration testing during implementation of the software.

- Unit testing — Individual components are tested. These components includes:
paper registration, PC workStation and GC workStation.
- Integration testing — This includes sub-system testing and system testing to test collections of modules which have been integrated into the sub-system and system. The integration testing was done for the client, the server, and the database. Incrementally a new module is added to test the system, until all modules are

combined together and work successfully. The integration testing represents all aspects of the complete system under all feasible and extreme conditions.

In order to satisfy the objectives of the verification and validation process, both static and dynamic techniques have been applied. Static verification is a method that involves static analysis and checking of system represented by the requirement document, design diagrams and the program source code at all software process stages. Static verification is applied to all processes. The dynamic validation has been used once the executable program was available. The top down approach was used in feasibility study and bottom up approach was used in Unit testing. It is carried out to ensure:

- The system Function can meet the customer's expectation.
- The system performance is acceptable
- The system reliability
- The system's robustness in terms of handling exceptions or incorrect input.

6.2.1 Input Control Testing

To verify the system the input control and assignment algorithm are highly dependable and remain capable of ensuring the desired degree of accuracy and system integrity, we document them to highlight our testing targets.

Control input is defined as the procedural controls necessary to handle data prior to computer processing. Input data must be handled very carefully since they are most probable source of errors in the entire system. For instance, in file uploading, if the name

of the uploading file being uploaded has already been used in the destination directory, the system will give a prompt and let the user change the file name. This will avoid an existing file being overwritten. If wrong data is input into the computer, the error results they generate may spread throughout the entire system. In order to keep errors to a minimum, the input items in the forms use selections as much as possible rather than typing. The data input validation and intelligent prompt will effectively speed up the input process and reduce data errors, such as entering user ID, name or password.

6.2.2 Allocation Algorithm Testing

Another important testing part is the assignments of papers to PC member for its complexity of the algorithm. Two groups of data samples were used for its testing. One is the small group of testing data that includes six PC members and five papers. When `pcAtLeastReviewPaNo` is 3 and `pcAtMostReviewPaNo` is 4, the result of allocation is successful. Another is a relatively bigger group of testing data that contains eight PC members and twenty papers. When `pcAtLeastReviewPaNo` is 6 and `pcAtMostReviewPaNo` is 8, the result of allocation is successful too.

But occasionally, when I changed the order of testing data the result was incorrect and zero value appeared in the paper ID number. After the allocation algorithm verification, the possible cause of this problem could come from the method `allocateSinglePaToPc6()` or method `allocateSinglePaToPc8()`. Those might make zero as part of `pcid` or `paid` for allocating PC member or paper. The result of individual testing case doesn't represent all the possible results. Using algorithm verifications can be more efficient than applying

testing case if the data quantity is quite large. Therefore the testing also involves those algorithm verification.

For real data allocation testing, the parameter list of `pcAtleastReviewPaNo` as 6 and `pcAtMostReviewPaNo` as 8 was used. The result of allocation shown was unsuccessful and the system threw an `ArrayIndexOutOfBoundsException`. So I checked all the code related to this allocation and fixed the size of arrays to make it big enough. But after extending the array size, the result is still unsuccessful, like “paid = 25” and “pcid =0”. Actually no PC ID number is 0. When the system tries to select `pcname` form `pc` table, `pcid='0'` threw a `java.lang.NullpointException`.

After testing this allocation algorithm, I analyzed and checked the code repeatedly. Finally I found that I missed the extreme condition (that is when the topics for many papers are of interest to a very limited number of PC members) that causes the error. And I fixed the bug.

6.3 Testing Plans and Test Cases

This section presents a series of testing plans and testing cases. I choose black box strategy to test all the Functions of CMS system based on the Functional Requirement Specifications in part 3. In the following SRD&S is abbreviation of System Requirement Definition and Specification.

6.3.1 Selection in Home Page

Testing cases:

- Enter 'Paper Registration' page.
- Enter 'PC Sign In' page.
- Enter 'GC Sign In' page.

Type	Selected Test Input Data	Expected Test Results	Testing Results	Comments (Special Requirements)
Function	Click on link 'Paper Registration'	Display 'Paper Registration' Page	Display 'Paper Registration' Page	Result satisfies SRD&S
Function	Click on link 'PC WorkStation'	Display 'PC Sign In' Page	Display 'PC Sign In' Page	Result satisfies SRD&S
Function	Click on link 'GC WorkStation'	Display 'GC Sign In' Page	Display 'GC Sign In' Page	Result satisfies SRD&S

Table 6-1 Admission Testing Case

6.3.2 Paper Registration

Testing cases:

- Show all the information that author submitted.
- Receive the paper files that author submitted.
- Show all the information about author and co-author.
- Upload files from web page.
- Back to the home page.

Test Type	Selected Test Input Data	Expected Test Results	Testing Results	Comments (Special Requirements)
Function	Author input all the information about paper and author then click submit button	Display all the information author just put in, and co_author form.	Display all the information author just put in, and co_author form.	Result satisfies SRD&S
Function	Go to jswdk1.0.1->webpage->collectedPapers directory to check just input file name.	The file author just input should be in the collectedPaper directory.	The file author just input should be in the collectedPaper directory.	Result satisfies SRD&S
Function	Author input all the co_author information into the co_author form then submit it.	Display all the author and co_author information and co_author form.	Display all the author and co_author information and co_author form	Result satisfies SRD&S
Function	Submit paper file which name has existed in the 'collectedPapers' directory	Display error message to let author rename file name.	Display error message to let author rename file name.	Result satisfies SRD&S
Function	Click on the link 'finish'	Return to the home page.	Return to the home page.	Result satisfies SRD&S

Table 6-1 Paper Registration Testing Case

The following figure is to show the data entered in Paper Registration form

Back Forward Stop Search Favorites History Home

Address: http://localhost:8080/servlet/PePageServer

Paper Registration

Please fill in the following information and choose the file. The file must be named according to the CFP.

Author Name: Peter

Author Title: Professor

Author Address: 423 St.patrick street

Email Address: peter@hotmail.com

Paper Title: Database Security

Paper Abstract: This is paper abstract.....

Paper File Name: D:\ConfSys\Meil.doc

please choose the topics of your paper. Use 'Ctrl' key to select multiple items

- Access Methods and Data Structures
- Active Databases
- Authorization and DB Security
- Concurrency Control and Recovery
- Constraint and Rule Management
- DBMS Architecture
- Data Mining and Knowledge Discovery

Figure 6-1 Data Entered in the Paper Registration Form

When an author finishes the above information and clicks the “Submit”, the corresponding feedback information shows as following figure6-2.

In the feedback information form, when user press the ok button the form of co-author’s information will displayed.

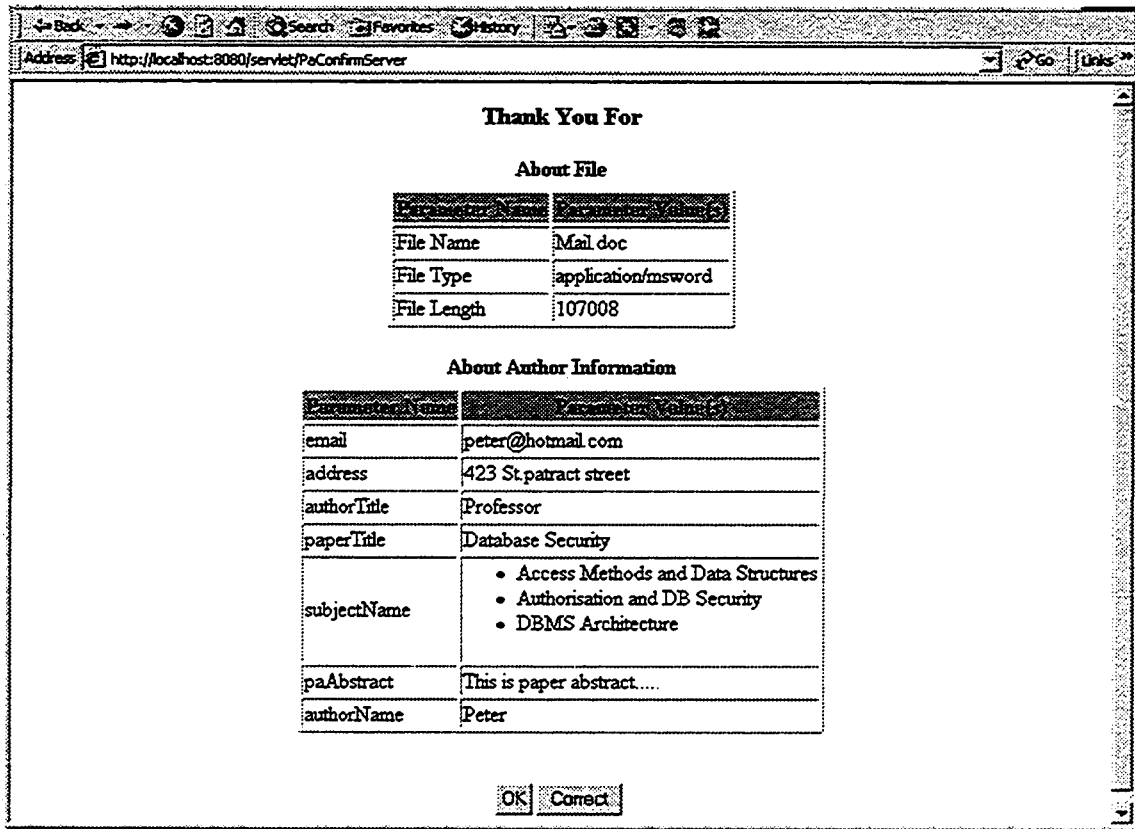


Figure 6-2 Feedback information entered in the paper registration form

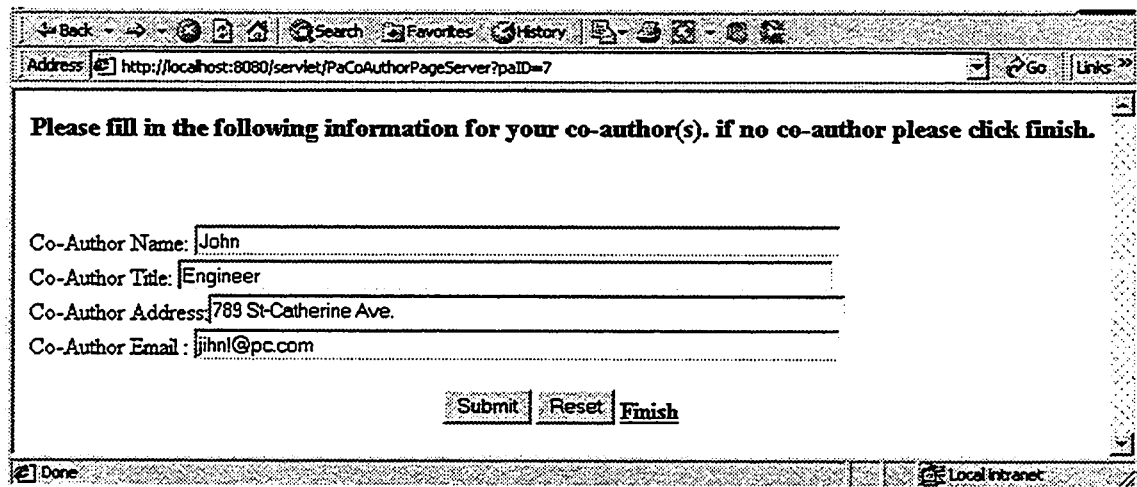


Figure 6-3 Data entered in the co-author form

The following figure shows the information of the above two co_ authors of the paper.

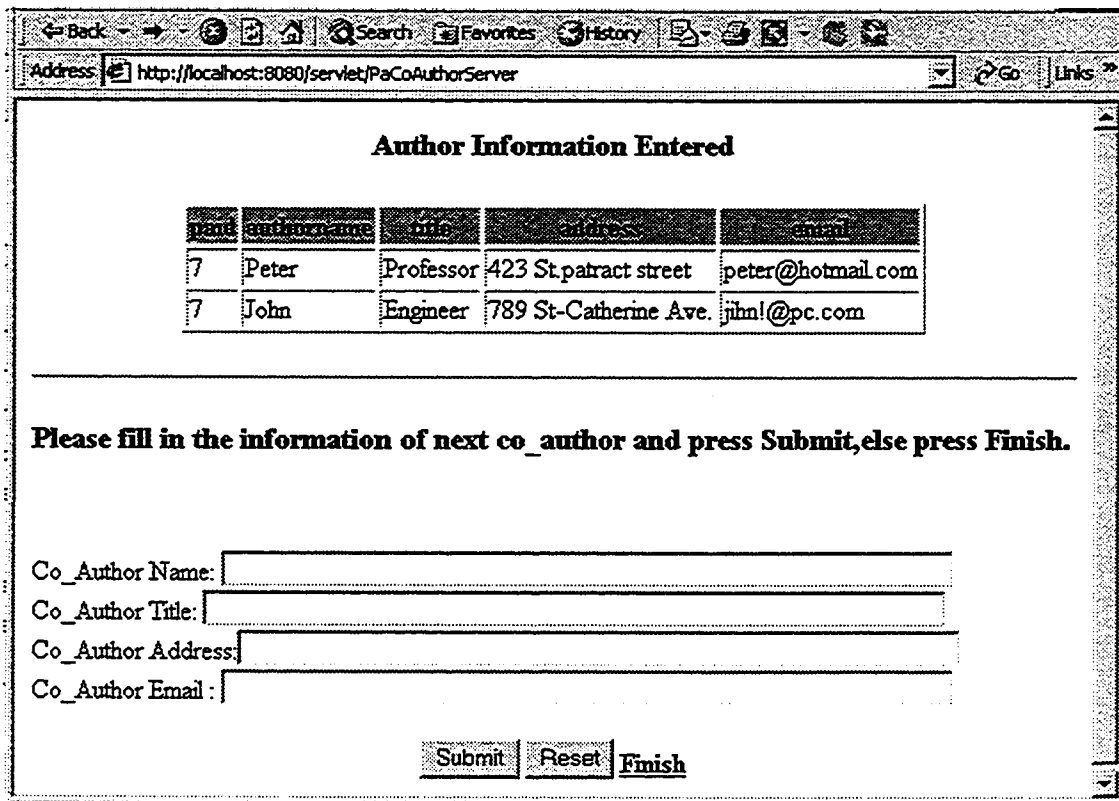


Figure 6-4 Show all the authors of a paper

6.3.3 PC Registration

Testing cases:

- PC member input correct name and password in “PC sign in” page.
- PC member input incorrect name or password in “PC sign in” page.
- PC member enters the “PC Registration” page.
- PC member input correct ID number and name and organization in PC registration page.
- PC member input incorrect ID number or name in PC member registration page.

Test Type	Selected Test Input Data	Expected Test Results	Testing Results	Comments (Special Requirements)
Function	PC member input the correct name and password in PC member sign in page then click the "Sign In" button.	Display the page that has four option for PC member	Display the page that has four option for PC member	Result satisfies SRD&S
Function	PC member input the incorrect name or password in PC member sign in page then click the "Sign In" button.	The error message will be displayed to let PC member type it again.	The error message will be displayed to let PC member type it again.	Result satisfies SRD&S
Function	PC member click the link 'PC Registration'	Display 'PC Registration' page.	Display 'PC Registration' page.	Result satisfies SRD&S
Function	PC member input correct ID number and name and organization. Then click submit button in the PC member Registration page.	Display information PC member just put in.	Display information PC member just put in.	Result satisfies SRD&S
Function	PC member input incorrect ID number or name. Then clicks submit button in the PC member Registration page.	Display error message and let member reenter PC member information	Display error message and let PC member reenter PC member information	Result satisfies SRD&S

Table 6-1 PC Registration testing case

In the following PC registration window, when PC member enters the PC member name, PC ID number, PC member organization, and clicks Submit PC member Information, a window which will display the information just enter appears.

The screenshot shows a web browser window with the address bar containing the URL: `http://dumbo.concordia.ca:8080/servlet/PCRegistePageServer?pcName=Zoe%20Lacroix&password=aaa`. The page title is "PC Registration". Below the title, there is a prompt: "Please fill in the following personal information." followed by four input fields: "PC ID:" (containing "4"), "PC Name:" (containing "Zoe Lecroix"), "Salutation:" (containing "Hl"), and "Organization:" (containing "Cagony University"). Below these fields is another prompt: "Please choose the topic on which you would like to review papers from the following. Use 'Ctrl' key when you select multiple items". A list box contains the following topics: "Constraint and Rule Management", "DBMS Architecture", "Data Mining and Knowledge Discovery" (which is highlighted), "Data Models", "Data Warehousing", "Database and Agent Technology", and "Database Benchmarks". At the bottom of the form are two buttons: "Submit PC Information" and "Reset".

Figure 6-1 PC Registration

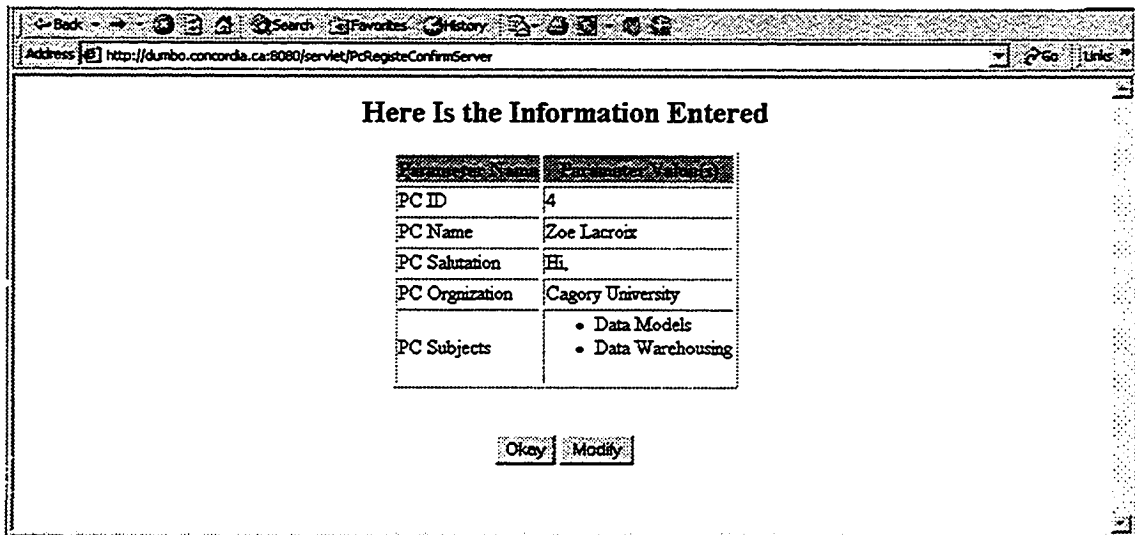


Figure 6-2 Show PC Information Just Put In

6.3.4 PC Download File

Testing cases:

- Enter the 'PC Download File' page.
- Check the list of files that the PC member is responsible for reviewing.
- Check the list of topics that PC member entered from the web pages.
- Download all the listed files which are going to be reviewed by the PC member.

Test Type	Selected Test Input Data	Expected Test Results	Testing Results	Comments (Special Requirements)
Function	PC member click the link 'PC Download File'	Display 'PC Download File' page	Display 'PC Download file' page	Result satisfies SRD&S
Function	Check the list of files names.	the list of files are the right files which the PC member is allocated for reviewing.	the list of files are the right files which the PC member is allocated for reviewing.	Result satisfies SRD&S

Test Type	Selected Test Input Data	Expected Test Results	Testing Results	Comments (Special Requirements)
Function	Check the list of topics	The listed topics are entered by the PC member from the web page before.	The listed topics are entered by the PC member from the web page before.	Result satisfies SRD&S
Function	Check whether the listed files can be download.	PC member can download all the listed files.	PC member can download all the listed files.	Result satisfies SRD&S

Table 6-1 PC Download file Testing Case

The following figure appears when PC member clicks the link ‘PC Download File’ option in the PC member work selection page. The following figure shows all the downloadable files name which are to be reviewed by this PC member. For example, PC member name is bbb and is allocated paper file name is shown in Figure 6-10.

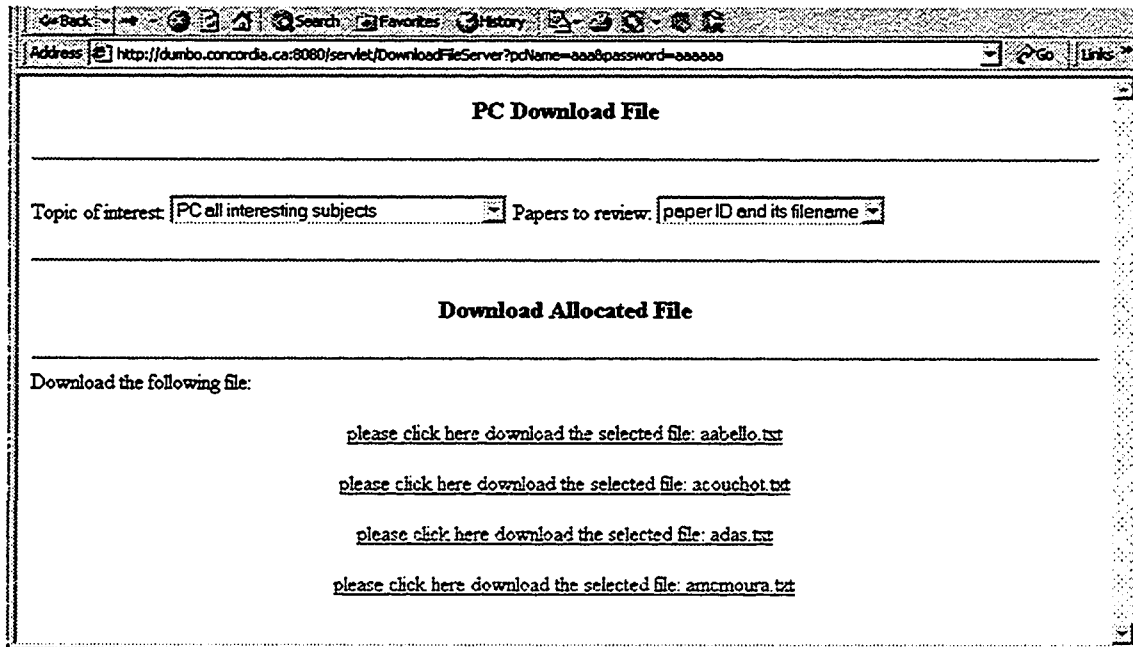


Figure 6-1 PC Download File

6.3.5 PC Review

Testing cases:

- Enter the 'PC Review Page1' page.
- Enter the 'PC Review Page2' page.
- Click the 'show Overview Paper Reviewed By The PC' button in the 'PC Review Page2' page
- Click the submit button in the 'PC Review Page2' page

Test Type	Selected Test Input Data	Expected Test Results	Testing Results	Comments (Special Requirements)
Function	PC member click the link 'PC Review'	Display 'PC Review Page1' page	Display 'PC Review Page1' page	Result satisfies SRD&S
Function	PC member click the button in the 'PC Review	Display 'PC Review Page2' page	Display 'PC Review Page2' page	Result satisfies SRD&S

Test Type	Selected Test Input Data	Expected Test Results	Testing Results	Comments (Special Requirements)
	Page1' page.			
Function	Click the 'show Overview Paper Reviewed By The PC' button in the 'PC Review Page2' page	Display ID, name, score, confidence, evaluation of all the papers reviewed by PC member.	Display ID, name, score, confidence, evaluation of all the papers reviewed by PC member.	Result satisfies SRD&S
Function	Click the submit button in the 'PC Review Page2' page	The database contains the information about paper's score, confidence, evaluation to author and GC the PC member just put in.	the database contains the information about paper's score, confidence, evaluation to author and to GC the PC member just put in.	Result satisfies SRD&S

Table 6-1 PC Review Page Testing Case

6.3.6 GC Input Data

Testing cases:

- GC input correct name and password in PC member sign in page.
- GC input incorrect name or password in PC member sign in page.
- GC enters the 'Input Data' page.
- Create database tables.
- Submit PC member's information to the database.
- Insert topic information into the database.

- Update GC's information in the database.

Test Type	Selected Test Input Data	Expected Test Results	Testing Results	Comments (Special Requirements)
Function	GC input the correct name and password in GC sign in page then click the 'Sign in ' button.	Display the page that has four options for GC	Display the page that has four options for GC	Result is correct
Function	GC input the incorrect name and password in GC sign in page then click the 'Sign in ' button.	The error message will be displayed to let PC member type it again.	The error message will be displayed to let PC member type it again.	Result is correct
Function	Click the link 'Input Data'	Display ' Input Data' page	Display ' Input Data' page	Result is correct
Function	Click 'create table' button	Database created all tables	Database created all tables	Result is correct
Function	Enter some PC member information then click submit button	In PC member table we can see the PC member's information just put in	In PC member table we can see the PC member's information just put in	Result is correct
Function	Insert topic name into the database topic table	From the topic table, the topic name just put in can be seen	From the topic table, the topic name just put in can be seen	Result is correct
Function	Update GC's some information in the PC table	From the PC table, we can see the updated GC's information.	From the PC table, we can see the updated GC's information.	Result is correct

Table 6-1 GC Input Data

6.3.7 GC Send Email

Testing cases:

- Enter 'Send Email' page.
- Send email to special personal.
- Send email to all the PC members to inform their ID number and password.
- Send email to some PC members who don't submit their topic yet.
- Send email to some PC members who don't submit their review yet.
- Send email to all the authors to inform the review results.

Test Type	Selected Test Input Data	Expected Test Results	Testing Results	Comments (Special Requirements)
Function	Click the link 'Send Email'	Display ' Send Email' page	Display ' Send Email' page	Result is correct
Function	From wang@cs.concordia.ca send email to Mr. Zang	Mr. Zang should receive the email from wang@cs.concordia.ca	Mr. Zang receives the email from wang@cs.concordia.ca	Result is correct
Function	GC send email to all the PC members. Click the 'sendInfoToAllPc' button	All the PC members should receive the email from GC	All the PC members receive the email from GC	Result is correct
Function	Set PC(ID=1) who doesn't submit topic. Then GC click the 'sendToPcRemindSubject' button.	PC member whose ID number is 1 should receive the email form GC.	PC member whose ID number is 1 receives the email form GC.	Result is correct

Test Type	Selected Test Input Data	Expected Test Results	Testing Results	Comments (Special Requirements)
Function	Set PC (ID =2) who doesn't submit paper's evaluation to author and GC. Then GC click 'sendPcRemindReview' button	PC member whose ID number is 2 should receive the email from GC.	PC member whose ID number is 2 receives the email from GC.	Result is correct
Function	GC send email to all the tested author	All the tested authors should received the email from the GC.	All the tested authors should received the email from the GC.	Result is correct

Table 6-1 GC send e-mail testing case

6.3.8 GC Allocate Paper

Testing cases:

- Enter 'Allocate Paper' page.
- Check the allocation result.
- Delete all the allocated items in database.
- Choose another group of parameters to reallocate.
- Show all the tables in the database.

Test Type	Selected Test Input Data	Expected Test Results	Testing Results	Comments (Special Requirements)
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Test Type	Selected Test Input Data	Expected Test Results	Testing Results	Comments (Special Requirements)
Function	Click the link 'Allocate Paper'	Display 'Allocate Paper' page	Display 'Allocate Paper' page	Result is correct
Function	Choose PC member review paper number then click 'startAllocate' button	If chosen parameters is right for the reality situation then will show successful result, otherwise show unsuccessful information	If chosen parameters is right for the reality situation then will show successful result, otherwise show unsuccessful information	Sometime result have some problem.
Function	If allocation is not success then click the 'deleteAllocatedItems' button	In the database all the allocated items should be deleted.	In the database all the allocated items are deleted.	Result is correct
Function	Reenter the parameters about paper number reviewed by PC member then click 'StartAllocate' button	If chosen parameters is right for the reality situation then will show successful result, otherwise show unsuccessful information	If chosen parameters is right for the reality situation then will show successful result, otherwise show unsuccessful information	Sometime result have some problem.
Function	Click 'ShowAllTable' button.	From web page GC can see most of tables just same as one in the database.	From web page GC can see most of tables just same as one in the database.	Result is correct

Table 6-1 GC allocate paper testing case

All the details about allocation test are discussed in section 6.2.2. For the convenience to GC, the button 'ShowAllTable' is set in GC Allocation form. By doing this, GC can check the information in the database.

6.3.9 GC Review Paper

Testing cases:

- Enter 'Review Paper' page.
- Submit GC's evaluation of paper.
- Show overview of all papers.

Test Type	Selected Test Input Data	Expected Test Results	Testing Results	Comments (Special Requirements)
Function	Click the link 'Review Paper'.	Display 'Review Paper' page	Display 'Review Paper' page	Result is correct
Function	After finishes the paper's evaluation then click submit button.	In the database paper table the GC's evaluation should be seen.	In the database paper table the GC's evaluation can be seen.	Result is correct
Function	Click 'showOverviewOf AllPapers' button.	In the web page all the papers's ID, title, file name, score, confidence, and so on, should be displayed.	In the web page all the papers's ID, title, file name, score, confidence, and so on, can be displayed.	Result is correct

Table 6-1 GC review paper testing case

In the GC review form there is a button allowing GC to view all the paper information.

This is convenient for GC to check the reviews about paper before evaluating the paper.

The following screen shot is provided as an example of each test data.

Back Search Favorites History

Address: http://dambo.concordia.ca:8080/servlet/GcReviewServer

Overview All Papers

PID	Title	Author	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1	Understanding Analysis Dimensions in a Multidimensional Object-Oriented Model	aabello.txt	6.0	2.2	9.0	3.8	7.0	2.3	7.0	3.3	7.0	
2	Improving Active Rules Termination Analysis by Graphs Splitting	acouchot.txt	7.0	3.3	8.0	3.0	8.0	3.5	6.0	3.3	7.0	
3	Tradeoff between Client and Server Transaction Validation in Mobile Environment	adas.txt	5.0	3.0	7.0	3.0	7.0	2.8	9.0	3.7	7.0	
4	Query Scheduling in Multiquery Optimization	agupta.txt	7.0	2.8	9.0	3.8	9.0	3.6	10.0	10.0	8.0	
5	Metadata Model for Email Classification	amcmoura.txt	9.0	3.6	8.0	3.4	8.0	3.3	No	No	8.0	

Done Internet

Figure 6-1 Show overview of all papers

7 Future Improvement

7.1 Assignment Papers to the members

The allocation algorithm is a complicated topic in CMS system. In many situations, no result can be found. The possibility of finding the result depends on the difference between the distribution of the interested topics of PC members and the distribution of paper's topics. The smaller this difference, the easier the assignment result can be found. If the difference is too big, no result can be found. This is one of the reasons why the paper assignment is difficult to be successful.

To some degree, the GC can control the distribution of PC member's interested topics, but not the distribution of Paper's topics. If the GC can receive most papers of the conference earlier and then invite the PC members, the GC may make the PC member's interested topics closer to the distribution of the papers. But generally it is not easy.

In this project, I have utilized one algorithm and several groups of parameters. It is quite difficult to get a perfect assignment result by doing it once according to the predetermined rule (each PC member needs to reviewed at least six papers and at most eight papers). So when the assignment was unsuccessful, the parameter tuning was necessary.

Also it is more efficient to write a small program to generate testing data group automatically and test the allocation algorithm directly. There is a lot of space to improve the allocation algorithm.

7.2 Graphic User Interface Design

A good interface design can help to avoid the inconsistency between system functions and appearances. It also serves as a guideline to the system developers and users.

In this project, Graphic User Interface design is not emphasized as an important part of the overall system. Current system user interface mostly use our intuitions without strictly following some GUI design principles. So some interface designs are not satisfied. For example, in the GC workstation form help information should be added to tell GC how to interact with the system. In the GC review form, when GC decides which paper is to be reviewed, all the information about this paper should be displayed. It is convenient for GC to retrieve the information related to some paper.

7.3 Software Development Process

Object Oriented techniques are applied in the process of software development in this project. However, Object Oriented Analysis was not carried out as a distinct phase in this practice, System design can be extended by using heterogeneous design schemes such as function design etc.

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