CHAPTER 6

Implementation

6.1 Introduction

This chapter introduces the implementation phase of IBMS which consist of system setup, procedures in using IBMS and other important information regarding system implementation. As IBMS is modeled as a client server system, the implementation of the system involves the network connection, database connection and server installation. This will be explained in detail in section 6.2. The architectural model is followed by a set of procedures and tool as been explained in the implementation phase.

The next section describes the use of IBMS in a procedural manner. The complete details on using the system have been explained in detail in section 6.3 for both Instructor and participants.

6.2   Setting Up the System

The IBMS system was modeled as a three tiered client server architecture. The components of IBMS were divided into three layers:

1. Presentation layer

2. Functionality layer

3. Data layer

All this three layers were logically separated in between them as shown in Figure 6.1 below.

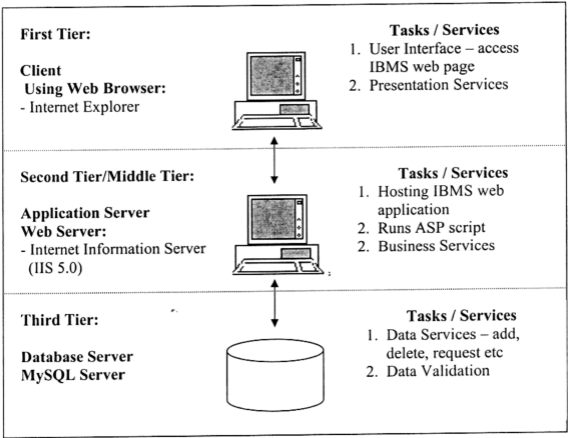| First Tier:	Tasks / Services
Client **Using Web Browser:** - Internet Explorer	1. User Interface – access IBMS web page 2. Presentation Services
Second Tier/Middle Tier: **Application Server** **Web Server:** - Internet Information Server (IIS 5.0)	1. Hosting IBMS web application 2. Runs ASP script 2. Business Services
Third Tier: **Database Server** **MySQL Server**	1. Data Services – add, delete, request etc 2. Data Validation

Figure 6.1: IBMS Three Tier Client Server Architecture

The clients interact with the middle tier via a standard protocol called as RPC. The middle tier interacts with the same server via standard database protocols. The middle tier contains the application logic which translates the client calls into database queries and other actions and translating data from the database into client data in return.

The system uses web browser such as Internet Explorer as a data presentation and data entry. The browser as a user interface specifies a uniform resource locator (URL) requesting a page from the IBMS Web Server.

The web server handles the requests from the web browser. The Web Server delivers the page to the browser over the network. As this system is built with client server architecture, security system were also have been implemented. The security system uses the cooperation of components at the top and middle tier to authenticate the user and authorize application services. The log in page was implemented for this purpose so that the middle tier authenticates the user and establishes a session.

Once the sessions were established, the web server stores the transaction state. The transaction states are the most recent data input by the user that has not been committed to the database.

Figure 6.3 and 6.4 are examples of source codes that have been implemented for the log in page of Instructor for IBMS. The user will enter their username and password from the web browser as shown in Figure 6.3. The html code

will request for the data through the asp scripts as shown in Figure 6.4. The ASP scripts shown in Figure 6.4 processes the requested data by validating the database and send back the response to the web browser on the client side as shown in Figure 6.2.
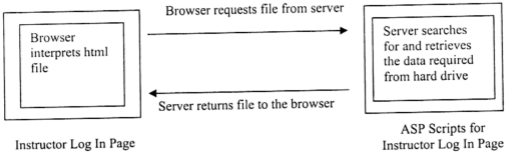
Browser requests file from server

| Browser interprets html file | | Server searches for and retrieves the data required from hard drive |

Server returns file to the browser

Instructor Log In Page

ASP Scripts for
Instructor Log In Page

Figure 6.2: Request and Response Process for IBMS Instructor Log In Module

```
<html>
........
.............
<form name="Login" method="post" action="inslogresponse.asp">
 <table width="273" border="0" align="left" cellspacing="0" cellpadding="0"

bgcolor="#CCCCCC">
   <tr bordercolor="#000000" bgcolor="#FFCC99">
    <td width="94" height="47" align="right" valign="bottom"><div
align="center">User name: </div></td>
     <td width="172" height="47" valign="bottom">
      <p align="center">       </p>
      <p align="center">
       <input name="txtUserName" type="text" size="20" maxlength="20">
</p></td>
   </tr>
   <tr bordercolor="#000000" bgcolor="#FFCC99">
    <td width="94" align="right" nowrap><p align="center"> </p>
    <p align="center">Password: </p></td>
    <td width="172">
     <p align="center">       </p>
     <p align="center">
      <input name="txtUserPass" type="password" size="20" maxlength="20">
     </p></td>
   </tr>
   <tr bordercolor="#000000" bgcolor="#FFCC99">
    <td height="44" align="right"> </td>
    <td height="44"><div align="center">
     <input type="submit" name="Submit" value="Enter">
      <input type="reset" name="Submit2" value="Reset">
    </div></td>
  .........</html>
```

Figure 6.3: Source Code for Instructor Log In Page

```
<%
Dim adoCon
Dim strCon
Dim rsCheckUser
Dim strsqlDB
Dim strSQL
Dim strUserName
Dim cn


strUserName = Request.Form("txtUserName")
strsqlDB = "ibmsdb"
Set adoCon = Server.CreateObject("ADODB.Connection")
cn.OPen "mahadev_mysql"
Set rsCheckUser = Server.CreateObject("ADODB.Recordset")
strSQL = "SELECT instructoregis.Password FROM instructoregis WHERE
instructoregis.UserName ="" & strUserName & """

rsCheckUser.Open strSQL, strCon
If NOT rsCheckUser.EOF Then
If (Request.Form("txtUserPass")) = rsCheckUser("Password") Then
Session("blnIsUserGood") = True

            Set adoCon = Nothing
            Set strCon = Nothing
            Set rsCheckUser = Nothing
            Response.Redirect"instructormainpage.asp"


      End If
End If
Set adoCon = Nothing
Set strCon = Nothing
Set rsCheckUser = Nothing
Session("blnIsUserGood") = False
Response.Redirect"denial.asp"
```

Figure 6.4: ASP Scripts for Instructor Log In

6.2.1 Database Connections

The database server was installed with MySQL Server 4.0. In order to connect the MySQL with Application server which runs ASP, MyODBC was installed. The installation procedures are shown below:

1. MySQL were installed to C:\msql in database server.

2. MyODBC were installed to connect to MySQL database

3. The following information were entered in the notepad:

    a) Save it to Windows Root Directory usually (C:/WINDOWS)

    b) Save it as my.ini

    c) The following were entered:

    [mysqld]

    basedir = c:/ mysql

    datadir = c:/ mysql / data

4. The windows command prompt were opened to type the following:

    C: \ cd   C:/ mysql / bin

    C:\mysql / bin > mysqld –nt   --install

5. When the service is installed, it will be started and stopped with the Windows Service Manager, or the NET START / STOP commands

6. Then the MySQL –Front will be installed and started up to manage the interface section of the database in MySQL server.

7. The stored data can also be entered in the database through MySQL-Front. The MySQL-Front will be able to show the databases being installed.

6.3   Testing the Intelligent Bank Management Simulation System

Once the system setup as described in section 6.2 was done, IBMS were ready to be used. In order to use the system, the users need to know about:

1. Starting a New Game

2. Game Administration

3. Playing the Game

4. Reviewing last quarter's results

5. Making Next Quarter's Results

6. Advancing to next quarter

7. Printing forms and report

8. Exiting the Game

6.3.1   Starting a New Game

Before beginning to play IBMS, the Instructor will start a new game. The participant will not be able to start a new game before the registration of the Instructor. The procedures are as follows:

1.   Go to the IBMS Home page

2.   The Instructor need to choose the "Registration" menu to register himself form the IBMS home page
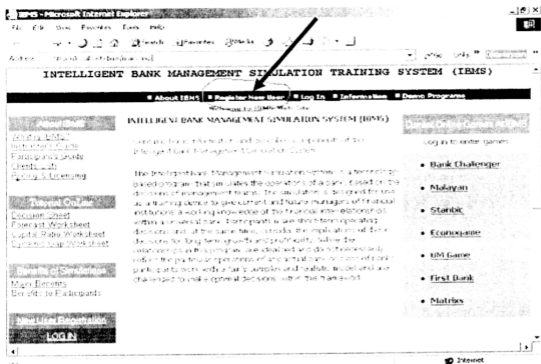
Figure 6.5: Main IBMS Page

3. Next, the Instructor need to log in to the system to enter the "Instructor Main Page"
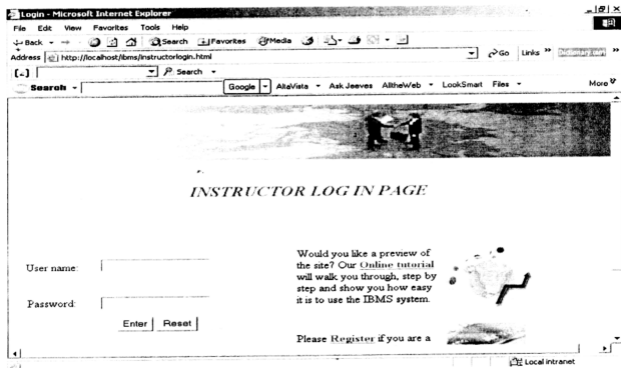

Figure 6.6: Instructor Log In Page

4.   The Instructor need to choose "Create a New Game" from the
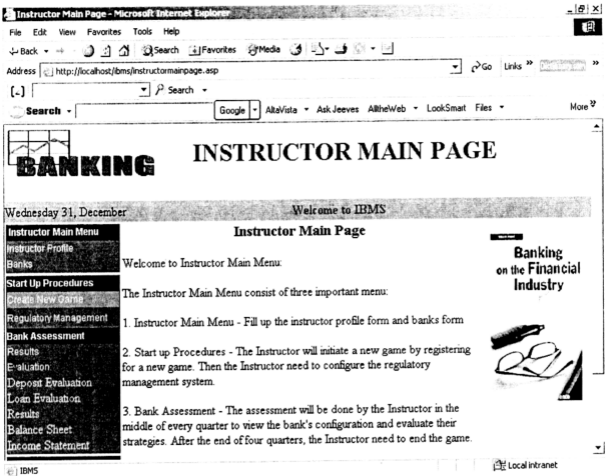   Instructor's Main Page.

Figure 6.7: Instructor Main Page

The procedures shown above are important to start a new game for the

participants.

6.3.1.1 Game Administration – Instructor

The Main Page is the primary point to select the tasks needed

by the IBMS to perform. In the main page, the users will be

able to select to go to Instructor's Main Menu or Student's

Main Menu. If it is an instructor, then he needs to choose Instructor's Main Menu.

Next, from the instructor's main page the instructor need to create a new game. This is done by selecting "Create New Game" form the IBMS's instructor's web page. Before clicking to a new game, the instructor needs to make sure:

1.   Names of banks in the new game and the additional information about the participants are created.

2.   Each participant should have registered to the IBMS system through the Registration menu in the main page.

During the process of starting a new game, the instructors need to supply the following information:

1.   Specify number of banks

Enter the number of banks needed in the game if it is a competition.

2.   Bank Name

Enter a name up to 10 characters long

3.   Economy Period

Choose the economic period

4.   Instructor Name

Enter a name up to 10 characters long

5.   Bank Chairman

Enter a name up to 10 characters long

Next, the Instructor needs to choose "Configure Regulatory Environment" button to configure the bank regulatory environment. The Instructor need to enter the specified information in the Regulatory environment page and press the submit button. Once the information has been submitted, the IBMS will write the beginning balance sheet and income statement. Each team will then have to review the current condition of its bank and make decision for the next quarter. The teams will be given a deadline for making decision and to submit the decisions made for that quarter.

6.3.1.2 Playing the Game

There should be six participants in a group. The participants need to go to main IBMS page and register themselves as IBMS participants. The participant needs to fill up the registration form and press the "submit" button.

Then the group leader need to choose the "student main menu" from the IBMS main page. The log in page will be shown for the participants to log in using their group id, user name and password. Once the participant have logged in to the system the participant will be taken to the participant's main page. The participant's main page. In the left side of the page, there will

be a list of menu to be chosen by the participants. As a first timer, the participants need to click the "Setting Up Corporate Profile" menu option. Next, the participants need to enter the corporate profile in the corporate page. The participant needs to enter the required information in the page such as the name of the participants, post, email addresses and their required task in playing the game. Once it is completed, the participants need to press the submit button and back to the participants main page.

Next, they need to choose the "Objective" which will take to a new page. In the objective page, the participants need to specify their goals and mission for each quarter. Once completed, the participants need to press the "save" button to store the information.

Once it is completed, the participants need to go back to the participant's main page and choose "Bank Management". The next page is considered as an important page as this is where the participants will be able to configure and view their previous results.

6.3.1.3 Reviewing Last Quarter's Results

Before the team makes decisions on each quarter, they need to analyze the results of the previous quarter. The participants can

view their results by choosing the 'Results" menu. The participants will be able to view their previous results and able to print out the results.

6.3.1.4 Making Next Quarter's Results

Each quarter the team needs to review the results of the previous quarter before making the decisions for the coming quarter. The participants can review the last quarter's results through the balance sheet and income statement. In order to make decisions for the coming quarter, the teams need to configure the list shown in the bank management page such as deposit interest rates, loan interest rates, expenses, securities and dividend. The easiest way is to begin by selecting the first option in the list which is "Deposit" and move on through the list.

6.3.1.5 Advancing to Next Quarter

To advance the current game to the next quarter, the instructor needs to select "Advance the Game to Next Quarter" from the bank management page. Advancing the game to the next quarter causes the IBMS to read the decisions from the team input values, calculate new results for the bank and then write the new results onto the database to be updated.

The instructors are not allowed to advance the game until all the decisions are made for that quarter. This is because once the instructors have advanced the game, the process cannot be stopped. Any missing information for the team or bank will be skipped and the decisions of the team will not be processed.

The IBMS will prompt a message box during the process of advancing to the next quarter to make sure the participants are warned before advancing to the next page.

6.3.1.6 Printing Forms and Reports

The IBMS can print information about the current game for the users if the users have a printer (local or network) connected to the computer. The users are allowed to print the current page or the whole report for the quarter. There are menu options for the participants to print in the management page.

6.3.1.7 Exiting the Game

Only the Instructor will be able to close the game. This is done by entering the Instructor's Main page choosing the "Exit Game" option form the list. The game can be closed even

without ending the four quarters. The participants are not allowed to exit the game.

6.4   Conclusion

In order to use IBMS, a three tier system need to be implemented as shown in section 6.2. The system was built as a web based system to be accessed by the users from any place around the world. This is a great advantage for the users compared to a standalone system. The system was also implemented in a three tier model to make sure that the servers are load balanced.

The instructors and the participants need to have pre-knowledge before using the system. As been explained in the implementation, the users need to follow the specified procedures before using the system.