CHAPTER 5

SOLUTION IMPLEMENTATION

5.1   System Specification

In order to conduct the integration testing on system, there are a certain minimum specifications of hardware and software as follows:

5.1.1   Hardware Specification

a) Server

Processor	: Pentium 4 1.7GHz
Memory	: 512 MB
Hard disk	: 40GB
CD Rom	: available
Networking tools	: LAN Card, UTP Cable

b) Client

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Processor	: Pentium 3 1.5GHz
Memory	: 256 MB
Hard disk	: 40GB
CD Rom	: available
Networking Tools	: LAN Card, UTP Cable

5.1.2   Software Specification

a) Server

- Windows 2000 Server

- Microsoft SQL Server 2000 enterprise edition

- .NET Framework 2.0

- Microsoft Internet Information Service

- Ajax Extensions

b) Client

- Window XP Operating System

- Mozilla Firefox and / or Internet Explorer browser

5.2   Operational Procedures
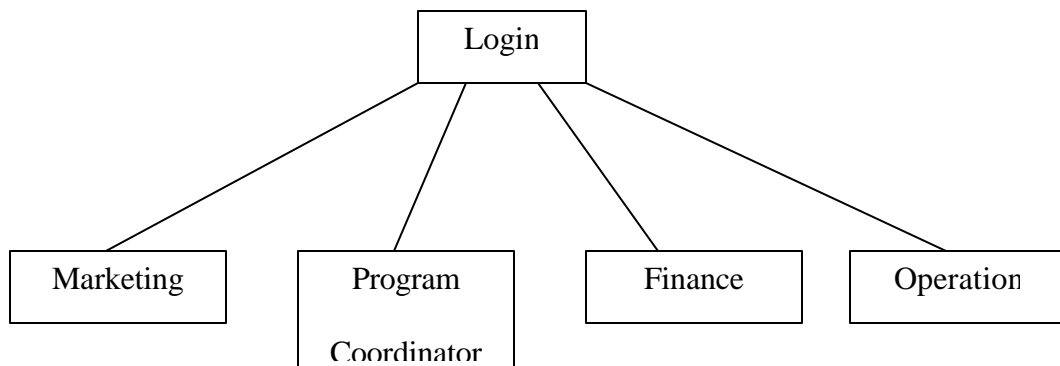
When a user would like to access the system, he/she would have to login to the system, and then regarding from their roles, whether as Marketing, Program Coordinator, Finance, or Operation, they will be directed to their pages. The pages are different one to another, depends on the operational transaction they need to use. This is done to avoid

job overlapping between one division and another. For further explanation, see Use Case Description from Adisti Bramanti[22].

5.3   Testing Strategy

The following is the testing strategies that are used to assess the database application, they are namely:

5.3.1   Alpha Testing

The aim of this alpha testing is to check the correctness of each module, which was conducted at the developers' environment. Before the application launched at the users' environment, the developers should have checked the flow of the system, does it run according to the design. In alpha testing, a preliminary prototype testing has been conducted, with the users monitored and explained step by step.

5.3.1.1 Module Testing

The aim of this module testing is to test the functionality of each data manipulation from the presentation layer, processed by the business logic layer, and therefore passed onto the data management layer. The modules of this system were divided into 5 categories, referring to the roles available:

5.3.1.1.1   Program Coordinator

a) Create New Program,

   Assume that the Program Coordinator has logged in, he/she can create a program.

Test Actions	Expected Result	Actual Result
The required fields of	The data is inserted into	As expected, the data has

Test Actions	Expected Result	Actual Result
Program Name, Program Description, Level Number, Level Description, Total Sessions, and Minimum number of Participants are filled. The button "Create Program" is clicked.	the database. The fields in the table Program and Program Levels are added, depending on the values inserted.	been inserted into the database.

b) Add New Class

Assume that the Program Coordinator has logged in, he/she could create a class or several classes. However, they can only be created once a program is created; there is actual data in the Program and Program Level tables. If he/she wants to create a class for another program, he/she must start from Create New Program.

Test Actions	Expected Result	Actual Result
The Program drop down list is clicked	The records from the column ProgramName from table Program is read, and displayed.	The drop-down-list lists the existing Program
Choose the Level from the chosen Program	The records from the column LevelNo from	The drop-down-list lists the levels exist from the

Test Actions	Expected Result	Actual Result
	table ProgramLevel is read, referencing from the chosen Program.	chosen Program
Fill in the required fields, that includes: Batch Number, Batch Price, the Mockup Exam details, and Classes details. The button "Create Class" is clicked	The data is inserted to the database. The fields in the Batch table, Mockup Exam table, and Class are added, based on the value that has been inserted.	As expected, the data has been inserted into database. By default, the ClassStatus attribute will have the value 'O', means Open for registration.

c) Update Class Status

Assume that the Program Coordinator has logged in, he/she had created at least one program. Furthermore, he/she had created at least one class, and there is actual data in the Program, Program Level, Batch, and Class tables. Noted that he/she must got into the "View Classes" page.

Test Actions	Expected Result	Actual Result
The Program Coordinator click the button 'Go' which view the selected class status	The lists of classes is displayed, based on selected status, referencing from table	A grid view representing the lists of classes has the selected status

Test Actions	Expected Result	Actual Result
	Class, with the attribute ClassStatus	
Click the 'View' link on the rightmost of the gridview	The ClassKey of the selected class is obtained, which holds the attributes of the Class.	The page is referred into another page, displaying the subsequent details regarding the selected class.
By default, a class is set to have the status Open, which can be changed into Run or Cancelled as wished. The button "Change Status" is clicked	The data is updated in the database. The attributes of ClassStatus in Class table is updated, based on the selected new-status.	The data is updated in the database. If the class status is changed to Run, then the value will be 'R', or 'C' if it is Cancelled

5.3.1.1.2   Marketing

a) Add New Participant

Test Actions	Expected Result	Actual Result
The required fields are all filled. The button "Add" in	All of the data has been inserted into database, affecting the tables	The data has been inserted into database

Test Actions	Expected Result	Actual Result
the end of registration sequel is clicked	involved: Participant, ParticipantToAims, ParticipantToKnowUsFrom, Education, WorksIn, Office and University.	
In the Office details page, select the company from the drop-down list	Displays the existing records read from the table office, with the attribute OfficeName	The drop-down-list lists Office Names
If the desired office is not in the drop-down-list, add new Office. Fill in the required fields. Button "Add" in the Add New Office page is clicked	The detail of Office data is inserted into database, affecting the table Office	The data is inserted into database
In the Education details page, select the university from the drop-down list	Displays the existing records read from the table university, with the attribute UniveristyName	The drop-down-list lists University names
If the desired university is not in the	The detail of University data is inserted into	The data is inserted into database

Test Actions	Expected Result	Actual Result
drop-down-list, add new University. Fill in the required fields. Button "Add" in the Add New University page is clicked	database, affecting the table University	

b) Enroll Participant to a Class

Test Actions	Expected Result	Actual Result
Search for a particular participant based on the filter, could be ParticipantID, first name, last name, home city, office, university, or major as wished. If the searched keyword returns nothing, then the participant must be registered first.	The table Participant and its child or related tables are read, comparing the filter with the value, and returns the matching records	A grid view listing relevant participants are generated
Click the 'Enroll' link	The Participant Key of the	The page is referred

on the rightmost of the grid view	selected participant is obtained, which holds the attributes of the Participant.	into another page, displaying the subsequent details regarding the selected participant.
Fill in the required fields, and the button "Enroll" is clicked.	All of the data has been inserted into database, affecting the tables involved: EnrolledIn and Payment, possibly the GuaranteeLetter as well.	The data is inserted into database

c) Edit Participant Details

Test Actions	Expected Result	Actual Result
Search for a particular participant based on the filter, could be ParticipantID, first name, last name, home city, office, university, or major as wished	The table Participant and its child or related tables are read, comparing the filter with the value, and returns the matching records	A grid view listing relevant participants are generated
Click the 'Edit' link	The Participant Key of the	The page is referred

Test Actions	Expected Result	Actual Result
on the rightmost of the grid view	selected participant is obtained, which holds the attributes of the Participant and related	into another page, displaying the subsequent details regarding the selected participant.
Fill in the updated fields, and the button "Edit" is clicked.	All of the data has been updated in the database, affecting the tables involved: Participant, ParticipantToAims, ParticipantToKnowUsFrom, Education, and WorksIn	The data is updated database

5.3.1.1.3   Finance

a) Update Payment Status

Assume that the participant has been enrolled to a class

Test Actions	Expected Result	Actual Result
Select a class, and then select a particular participant. Fill all the required fields, the	The table EnrolledIn which holds the attribute of PaymentStatus will be updated	Data is updated in the database

Test Actions	Expected Result	Actual Result
button "Update" button		

5.3.1.1.4 Operation

a) Add New Session

Assume a class has already been created

Test Actions	Expected Result	Actual Result
Select a class, and then select a particular participant. The view link has been clicked. The button "Add new session" is clicked, fill all the required fields	The table SessionAttendance will be affected, the values will be inserted	Data is inserted in the database

b) Update Attendance Status

Assume that a session has been created, with the list of participants enrolled in it.

This is the subsequent step after a)

Test Actions	Expected Result	Actual Result
Check the checkboxes if the participants are	The table SessionAttendance will be	Data is updated in the database

Test Actions	Expected Result	Actual Result
present in the session. The button "Update" has been clicked	affected; the values will be inserted, with the status 'P' will be inserted as Present in the attribute Status, per participant.	

c) Close Class

Assume that the class has been run and all of the sessions have been completed. This is subsequent step after b)

Test Actions	Expected Result	Actual Result
The radio button of class status was updated to Closed. The button "Update" was clicked	The class status in the Class table was updated to L and the graduate statuses were shown	Data is updated in the database

5.3.1.1.5 Admin

a) Add new user

Assume that admin has logged in to the system; he/she can register new users in order to use the application

Test Actions	Expected Result	Actual Result
The Add User link was clicked, and the required fields are filled. The "Add" button was clicked.	All of the data has been inserted to the database, affecting the Staff table	Data is inserted in the database

b) Edit user

Assume that admin has logged in to the system; he/she can edit the details of the existing users. This is the subsequent step after a)

Test Actions	Expected Result	Actual Result
The Edit User link was clicked, and the required fields are updated. The "Edit" button was clicked.	All of the data has been updated to the database, affecting the Staff table	Data is updated in the database

c) Delete user

Assume that admin has logged in to the system; he/she can delete the details of the existing users. This is the subsequent step after a)

Test Actions	Expected Result	Actual Result
The Edit User link was clicked, and a	The Staff table in the database is updated, in	Data is updated in the database. The deleted

Test Actions	Expected Result	Actual Result
particular user is deleted, by clicking the "delete" link.	particular is the attribute DeletedFlag set to "Y", meaning he/she is deleted logically in the database, not physically.	user will no longer be listed in the user list.

5.3.2 Beta Testing

The aim of this testing is to check whether the application runs on the user's environment. The application was implemented on JWC's server and accessed by the testers through the LAN using their personal computer's browser. Testers included the actual users of the previous system in order to gain feedback on the new application based on their expectations.

After all of the modules were tested by three users, questionnaires were given to them, in order to gain their feedback.

5.3.2.1 User Acceptance Test

As for preliminary test, a user acceptance test has also been conducted. Questions regarding the information are conveyed, as:

1. Does the system provide adequate information?

The aim of asking this question is to check the data integrity of the system. For example, a Marketing Staff needs to know which class is open, so that he/she could

do promotion regarding the upcoming class. In addition, if a Finance Staff would like to update the payment status of system, he/she would not need to get through other personal details, such as education background of a person. He/she will only look at the relevant details, such as which class does the participant belong to, with minimum detail displayed such as only first name, last name, and participantID.

2. Does the information provided accurate?

The aim of asking this question is to check whether the data consistency. Does the data consistent per user, for example, when a Marketing Staff set the personal details, or office details, whenever he/she would like to get the desired information, the data will be the same, and stays accurate, depends on the registering period. Even when the data need to be updated, in the future, when he/she needs to find it, the most updated data will be returned.

3. Can you easily find the desired information?

The aim of asking this question is to check the data accessibility. For example, Marketing Staff could search for a particular participant based on a simple parameter, and it still returns some results that satisfy the need. In this case, if he/she would like to search for a particular participant having the name 'sa', all of the participants with the first name containing the word 'sa' will be returned.

4. Is the system faster than the previous system in terms of retrieving data?

The aim of asking this question is to check the system performance. When he/she is looking for a particular data, the system will display the desired information right

away. For instance, in searching a participant based on their Office, the system will return the desired information by a click of a button, and the conventional search using manually sorting and scanning through the whole pile of files is avoidable.

5. Does this system improve the exchange of information between your division and other divisions?

The aim of asking this question is to check the data synchronization. For example, if the Program Coordinator updated the class status to 'Run', then Marketing or Operation Staffs will have the same information as well.