

## **CHAPTER 3**

### **Methodology**

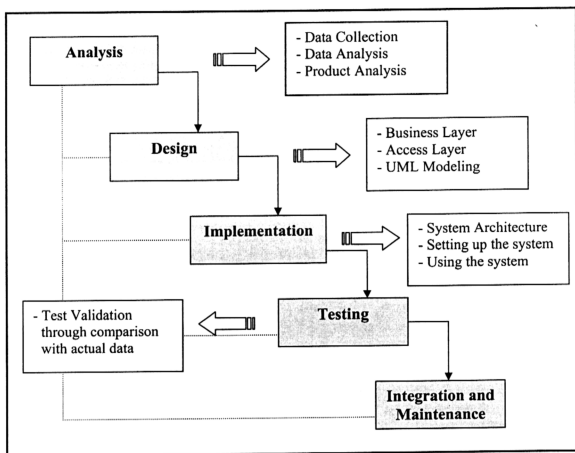
#### **3.1 Introduction**

In this research the focus were to evaluate on customer participation towards the use of IBMS. This research involves the development of IBMS and evaluation process that need to be done on the developed product.

Considering the scope, sensitivity and depth of this research, Waterfall Model was used as a research framework in order to develop the system. Later an evaluation procedure was used to evaluate the system performance.

#### **3.2 Waterfall Model**

The Waterfall Model describes the development method for the research in a linear and a sequential way that have specific goals for each phase of development. The development phase moves from analysis, through design, implementation, testing and integration. The Object Oriented Modeling techniques have been incorporated in the Waterfall Model. In the design phase, class diagrams were used to identify the important components related to the development of the system. Sequential diagrams were used to identify the flow of the system.



**Figure 3.1: Waterfall Model Incorporated with Object Oriented Modeling Technique**

### 3.2.1 Analysis

The first phase of Waterfall Model is Analysis. The Requirement Analysis for IBMS is shown below:

### 3.2.1.1 Subjects

In order to increase the validity of the study, four bank executives from each six different banks have been recruited for the survey. Table 3.1 displays the profile of the 24 subjects.

**Table 3.1**  
**Profile of the participants**

Variable	Count	Percentage (%)
<b>Organization</b>		
Maybank, Seremban	4	16.67
Hong Long Bank, Seremban	4	16.67
Southern Bank, Subang Jaya	4	16.67
Baffin Bank, Subang Jaya	4	16.67
Public Bank, Seremban	4	16.67
RHB Bank, Subang Jaya	4	16.67
<b>Gender</b>		
Female	18	75
Male	6	25
<b>Age</b>		
27 – 35 years old	16	66.67
36 – 45 years old	8	33.33
<b>Job Tenure</b>		
<5 years	6	25
6 – 10 years	14	58.33
21 – 25 years	4	16.67
<b>Computer Experience</b>		
<1 year	0	0
2 – 3 years	0	0
4 – 5 years	5	20.83
6 – 7 years	4	16.67
>8 years	15	62.5

### **3.2.1.2 Data Collection**

The secondary(historical) data in the form of magazines, newspaper articles, journals and articles from the website that reflect the simulation based training system in both local and international were collected. The primary data collection methods will include the questionnaires.

In order to develop a simulation system, the banking data's need to be collected. The data's that need to be collected are:

1. Bank Annual Report
2. Malaysian Central Bank Report
3. Malaysian Economic Statistics
4. Statistics on Interest Rate: Deposit and Loan

### **3.2.1.3 Interviews**

Interviews were conducted with the bank executives and Bank Managers. The duration of each interview was approximately one hour and conducted on a one-to-one basis. There were four interviewee from each banks.

#### **3.2.1.4 Data Analysis**

Data Analysis focused on analyzing the current Bank Management Simulation that is available for target users. A number of products such as Real Money simulation and Bank President were analyzed.

#### **3.2.1.5 Product Analysis**

Product Analysis involves two main components:

1. IBMS Functional Requirement
2. IBMS Non-Functional Requirement

The IBMS Functional Requirement involves the identification of user and system functionalities. The non-functional requirement was done to identify the constraint under which IBMS need to be met and the standards that need to be met.

### **3.2.2 Design**

In the design phase an architectural design will be developed according to the flow of the system and after the identification of the important components in IBMS. The design phase will be divided into three main layers:

### **3.2.2.1 Business Layer**

This will include a class diagram that represents the business (both data and behavior). The class diagram will be model the whole business and how they interact to accomplish the business processes. The class diagram captures the static and dynamic relationship that exists in between the business objects. It includes the associations and aggregations in between objects.

### **3.2.2.2 Access Layer**

This layer is responsible for the representation of the storage class diagram. The access class layer was responsible for:

1. Translating Request

It should be able to translate any data-related request from the business layer into appropriate protocol for data access.

2. Translate Results

It should be able to translate the data retrieved back into the appropriate business objects and pass those objects back to business layer.

### **3.2.2.3 Interface Layer**

The layer is responsible for the representation of the user interface for IBMS. The interface layer is useful in managing the IBMS system.

## **3.2.3 Implementation**

The implementation phase was divided into two phases:

1. System Architecture
2. Using the system

### **3.2.3.1 System Architecture**

The implementation phase focuses on the system architecture. As IBMS is a web based system, the architecture need to be identified to set up the web server and database server.

### **3.2.3.2 Using the System**

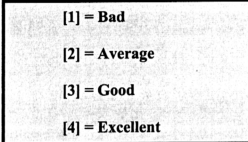
In this phase, the procedures of using the system need to be clearly identified.

### 3.2.4 Testing

The testing was done on the system to validate that the software functions with sufficient accuracy with respect to its requirements specification. The test data will be compared with the Central Banks' data to validate the accuracy of the test data.

## 3.3 Evaluation

The variables were measured by using a rating based structured questionnaire. The questionnaires contain a rating scale from 1 to 4 as shown in Figure 3.2.



<b>[1] = Bad</b>
<b>[2] = Average</b>
<b>[3] = Good</b>
<b>[4] = Excellent</b>

**Figure 3.2: Rating Scale**

### 3.3.1 Evaluation based Questionnaires

The questionnaires include six important aspects which will have a rating system from 1 to 4 as explained in the earlier stage. The important aspects to be evaluated are:-



**1. Program Content**

The questionnaires were focused towards system objectives, information accuracy, supporting materials and quality of the instruction in reference to the objectives.

**2. Effectiveness**

The questionnaires were related to participant's capability to recall the information presented through IBMS, development of individual interest towards banking through the use of IBMS and the appropriateness of the system as a training module.

**3. Practice / Assessment / Feedback**

The evaluation was done on the type of feedback received through the responses, objective accomplishment and about collaborative learning.

**4. Users Appeal and Suitability**

The evaluation was related to the suitability of the tutorials, interest level towards the training system and input appropriateness.

**5. Ease of Use**

The questionnaires were more focused towards user navigation, system consistency, responses and interfaces.

**6. Presentation**

The evaluation was focused towards the quality of screen displays, text and system layout.

### **3.3.2 Experimental Procedures**

All experimental sessions were conducted in the subjects' office. The procedures were as follows:

- a. Subjects listened / read the background statement
- b. Subjects were then trained to use the system
- c. They were randomly assigned one experimental tasks and when completed, they were then asked to complete an evaluation questionnaires.

## **3.4 Software**

The application or Intelligent Bank Management System will be created using Active Server Page or ASP. ASPs are server generated pages which can call other programs to do things like access databases, serve different pages to different browsers and etc. ASP is almost as efficient as writing code directly to the server's application program interface.

Active Server Pages is an open, compile-free application environment in which we can combine HTML, scripts, and reusable ActiveX server components to create dynamic and powerful Web-based business solutions. Active Server Pages enables server-side scripting for IIS with native support for both VBScript and Jscript.

The ASP's operational method can be defined as follows:

1. Request - to get information from the user
2. Response – to send information to the user
3. Server – to control the Internet Information Server
4. Session – to store information about and change settings for the user's current web server session.
5. Application – to share application-level information control settings for the lifetime of the application.

### **3.5 Conclusion**

The waterfall model is very useful for this research as a schedule can be set with deadlines for each stage of IBMS development. The development moves from the basic concept of analysis, design, implementation and testing. Once the problem have been identified through analysis, it is easy to get down to the process of designing a solution in accordance to the given objective and criteria. The techniques, methods and measurement were used appropriately in each phase of development.