CHAPTER 4
RESULTS AND DISCUSSION

4.1. System Design

System design can be defined as: "Stage after an analysis of the system development cycle: definition of functional requirements for the design and implementation of preparation; describe how a system was formed."

A. The purpose of the system design;

The design phase of the system has two purposes or main objectives, namely:

1. To meet the needs of the users of the system.
2. To provide a clear and complete design to computer programmers and other technical experts involved. The goal is more inclined to the detailed design of the system, namely Design and build a clear and complete for will be used for the manufacture of computer programs.

B. Definition of System Design According to Experts is;

According to John Burch and Gary Grudnitski in the book Analysis and Design, Information Systems Structured Approach is: "The system design can be defined as a description and making a sketch or arrangement of several separate elements into a unified whole and functioning." From the above definition, it can be concluded that the design of the system is the stage in the form of depiction, planning and manufacturing by integrating several separate elements into a unified whole to clarify the form of a system. According Yavri D. Mahyuzir in his book Data Processing mention some steps that need to be done on the system design process are:

1. Analyze the problem from the user (user); the goal is to gain a deep understanding of the needs of the user.

2. The feasibility study, comparing alternatives troubleshooting to determine the most appropriate solution.
3. Design the system, making the proposed solving the problem logically.
4. Detailed design, perform system design problem solving in detail.
5. Application of moving the program logic that has been made in the selected language, test programs, test data and output.
6. Maintenance and evaluation of the system have been applied.

C. Steps in System Design

1. The Planning Phase.
2. Defining the Problem, the system is running and the system is proposed.
3. Determine the purpose of the system
4. Identify system constraints
5. Creating a feasibility study (TELOS)
6. The decision rejected / accepted

D. Phase Analysis

1. Create an organizational structure
2. Define information needs
3. Defining the system performance criteria.

E. Stage Design

1. Prepare a plan.
2. Create Context Diagrams.
3. Create DFD.
4. Create IOFC.
5. Creating ERD.
6. Designing Data Dictionary.
7. Creating a Flowchart.
8. Designing File (master, input, process, temporary)

9. Designing the Input Dialog.
10. Designing Dialog Output
11. Setting up the system configuration

F. Implementation Phase

1. Setting up hardware and software.
2. Implementation of Programming
3. Testing.
4. Cutover

G. Phase Usage

1. Audit System
2. Maintain System

4.1.1. Objective System Design

1. The application web-based Human Resource Management System of NewFix Limited is amied that the Human Resource Manager (HRM) will receive sent application forms, read queries from employees, manage employees data and giving passwords to employees for their profiles.
2. The application will serve as an informative center for seeking information regarding the company's progress such as producing monthly reports, news and events etc,,,
3. The application also serves to help employees to sent queries if there is no satisfactory within the organization, see the various job descriptions, be able to log into their account, etc,,
4. The application also will assist the general public to seek information about the firm, be able to download and upload application forms and also send querries on the grounds of seeking more information.

4.1.2. Proposed System Overview

The proposed system for NewFix Limited Human Resource Management will to use the concept of client-server, to the client using the browser and the server using PHP and MySql and done online, where the user or client can access these applications using the Internet access provider or use wifi internet connection.

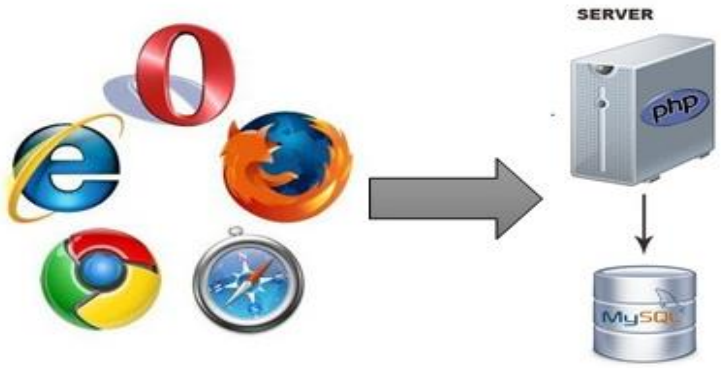


Figure 4.1 Client - Server Architure

4.1.3. Proposed Design Procedure

This design includes the use case diagrams, activity diagrams, sequence diagrams, class diagrams, collaboration diagrams, component diagrams and deployment diagrams that produce a better system. Process designed broken down into several sections which can be formed into a single unified system component.

a. **Use Case Diagram**

Use case describes an interaction between one or more actors with information systems that will be made. Roughly speaking, the use case is used to determine what function is in an information system and who is entitled to use those functions. The

following is the use case diagram of the system of Human Resource Management (HRM) of the proposed web-based NewFix LImited.

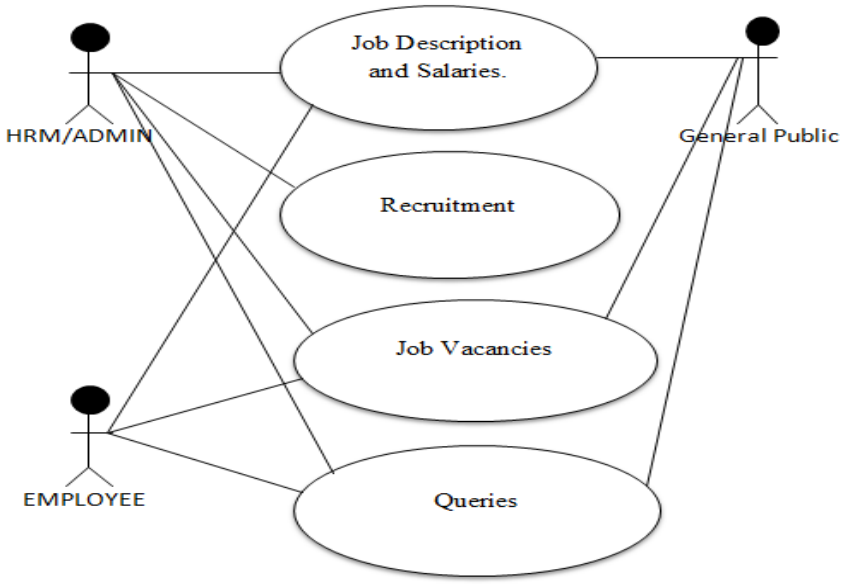


Figure 4.2 Use case diagram HRM Information System.

b. **Scenario Use Case.**

Use case scenarios are used to make it easier to analyze scenarios that will be used in subsequent phases by assessing these scenarios, the following use case scenarios proposed.

1. Scenario Use Case Job Description and Salaries.

The use case scenario Job Description and Salaries system proposed is as follows:

1. Name of the use case : Job Descritpion and Salaries
2. The main actors : HRM, Employee, General
3. Purpose : TO see the type of job with their Salaries

Table 4.1 Scenario Usecase Job Description and Salaries Proposed

(Applicant)	System
1. The applicant goes to the Job Description and Salaries menu and clicks	
	2. Displays the Job Description and Salaries page news
3. Clicks on the various types of job.	
	4. Display all jobs
5. Select the available job designated	
	6. Display the designated job
7. Clicks on the application form for the designated job	
	8. Downloads the application form
Scenario Alternative	
	9. No availability of the designated job.
10. Sends query to the admin showing interest	

2. Scenario Use Case Recruitment

The use case scenario Recruitment system proposed is as follows:

1. Name of the use case : Recruitment.
2. Main actor : HRM
3. Purpose : Performs the recruiting of applicants

Tabel 4.2 Scenario Use case Recruitment Proposed

Recruitment	System
1. Sends the recruitment notice via the system	
	2. Displays the notice
3. Screens the application forms and sends the results	
	4. Displays Result of applicants
5. Meet new applicants and updates new applicant data	
	6. Saves new applicant data
7. Creates and give new password to applicant	
	8. Saves password for applicant
Scenario Alternative	
	9. If the password is incorrectly entered by the applicants the system rejects the excess of applicant.
10. Renews password within the system and gives new password.	

3. Scenario Use Case Job Vacancies.

The use case scenario Job Vacancies system proposed is as follows:

1. Name of the use case : Job Vacancies

2. Main actor : HRM, Employee, General Public

3. Purpose : To see and apply for vacant jobs.

Tabel 4.3 Scenario Job Vacancy

Job Vacancies.	**System**
1. Aplicant clicks on Job Vacancy	
	2. Displays all job
3. Clicks on jobs available	
	4. Display jobs that are available
5. Clicks the desired job	
	6. Displays the job
7. Checks position of the job	
	8. Displays the position of the job
9. Fill and upload application form	
	10. Saves the uploaded application form
Scenario Alternative	
	11. If the job position not available will return back to job list menu.
12. Check other jobs positions.	

4. Scenario Use Case Query

The use case scenario Query system proposed is as follows:

1. Name of the use case : Query

2. Main actor : Employee, General Public

3. Purpose : Facility to provide the value of faculty to students

Tabel 4.4 Scenario Usecase Query.

Query	System
1. Clicks Query menu	
	2. Displays the Qurey page
3. Sends Query to HR/Admin	
	4. Stores Query to HR/Amin page
5. HR/Admin opens the query in Admin	
	6. Displays Query menu in Admin
Scenario Alternative	
7. Query already been sent but not received by the HR/Admin.	
	8. The Query has already bin received and read by the HR/Admin

Following are the activity diagrams for the Human Resource information system of NewFix Limited which will show the detailed flow of data and the processes involved in the various sections of the system.

1. Activity Diagram Job Description and Salaries.

In this section we describe the workflow at **Job Description and Salaries** proposed system which aims to see the flow of the process that is being proposed.

The Activity diagram is as follows:

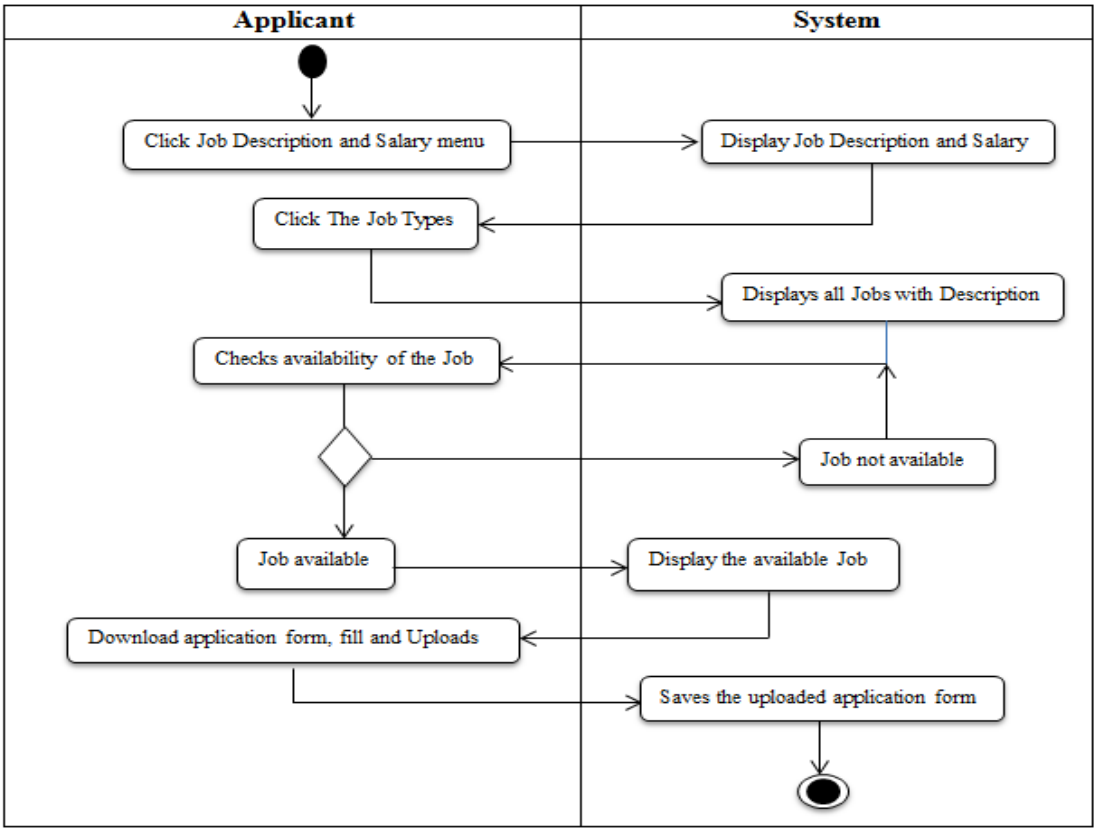


Figure 4.3 Activity Diagram Job Description and Salaries

2. Activity Diagram Recruitment

In this section we describe the workflow in the system proposed Recruitment aiming to see the flow of the process that is being proposed system.

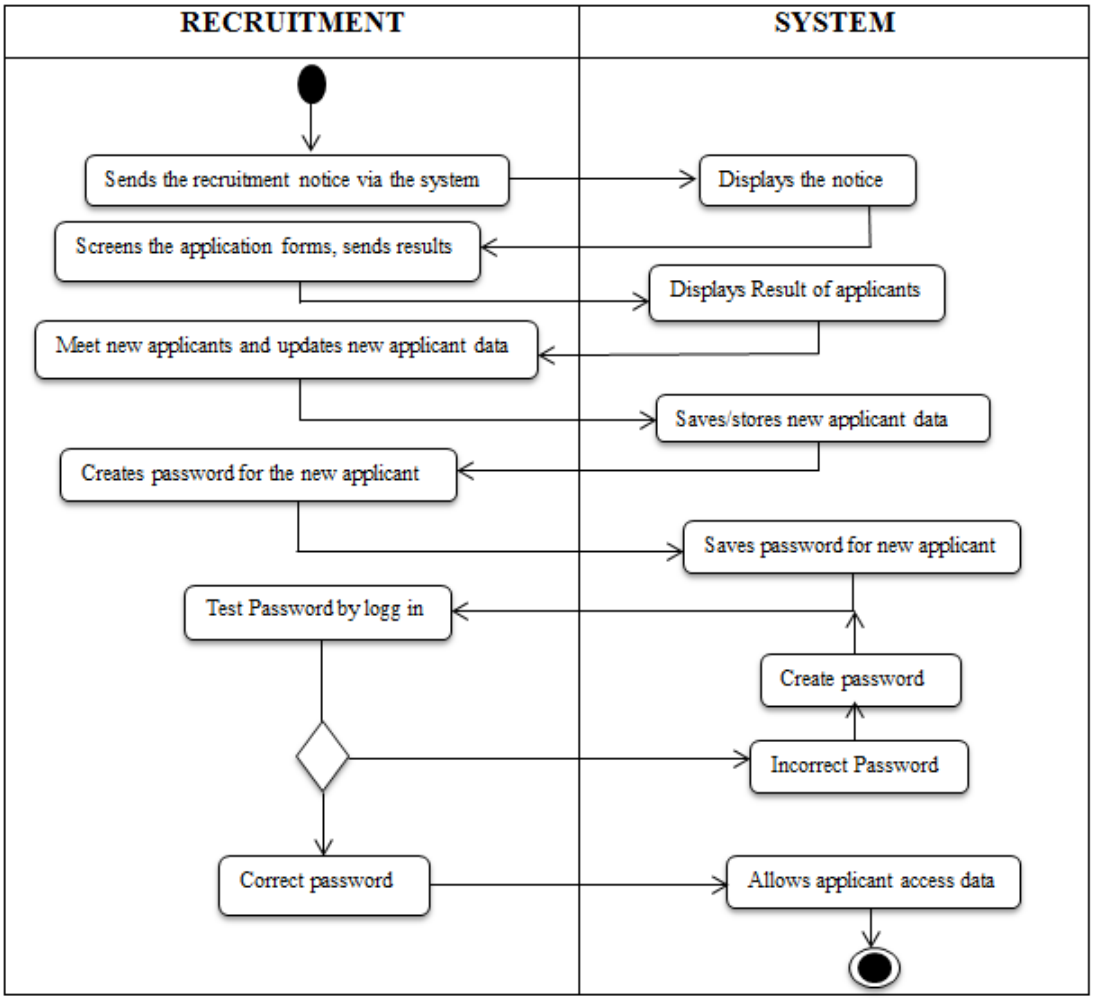


Figure 4.4 Activity Diagrams Recruitment proposed

3. Activity Diagram Job Vacancy.

In this section we describe the workflow in the system Job Vacancy proposed which aims to see the flow of the process that is being proposed system. The Activity diagram is as follows:

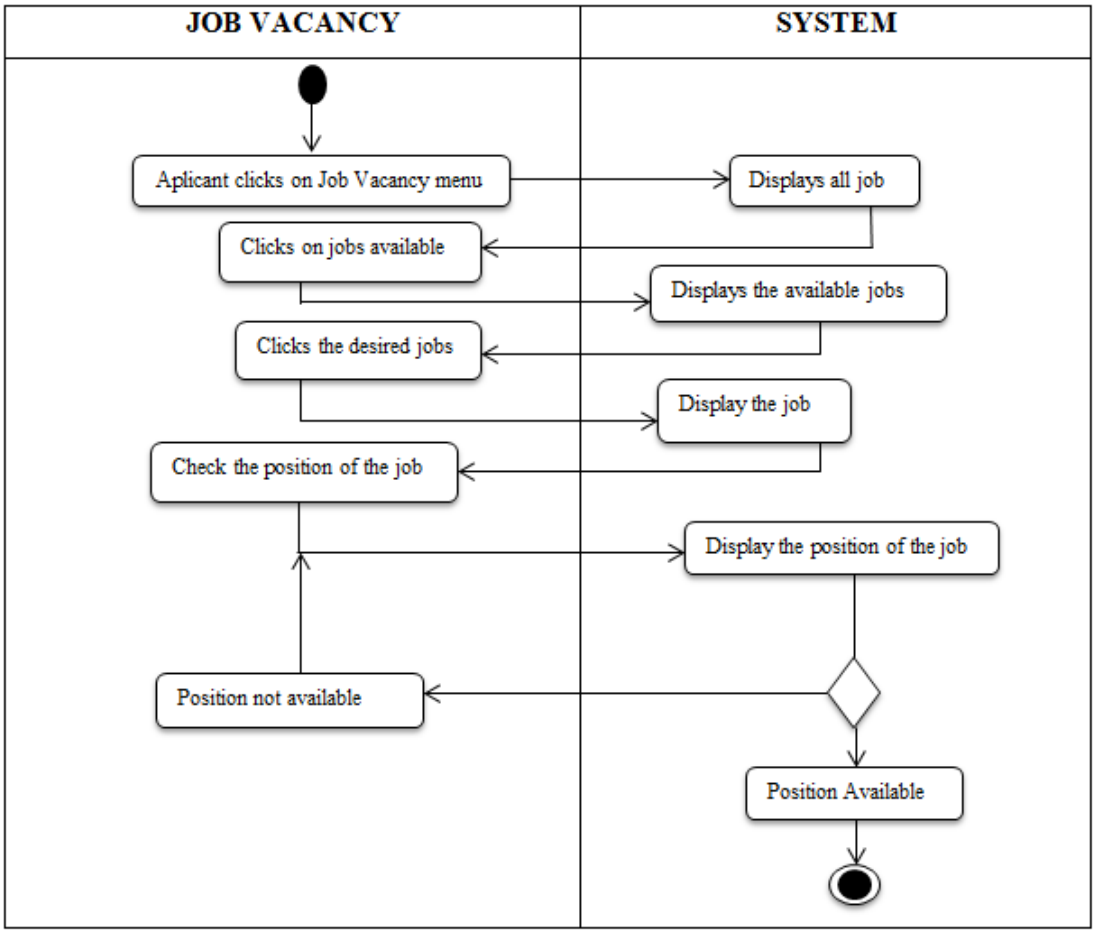


Figure 4.5 Activity Diagrams Job Vacancy proposed

4. Activity Diagram Query.

In this section we describe the workflow in the Query of the proposed system that aims to see the flow of the system that is being proposed.

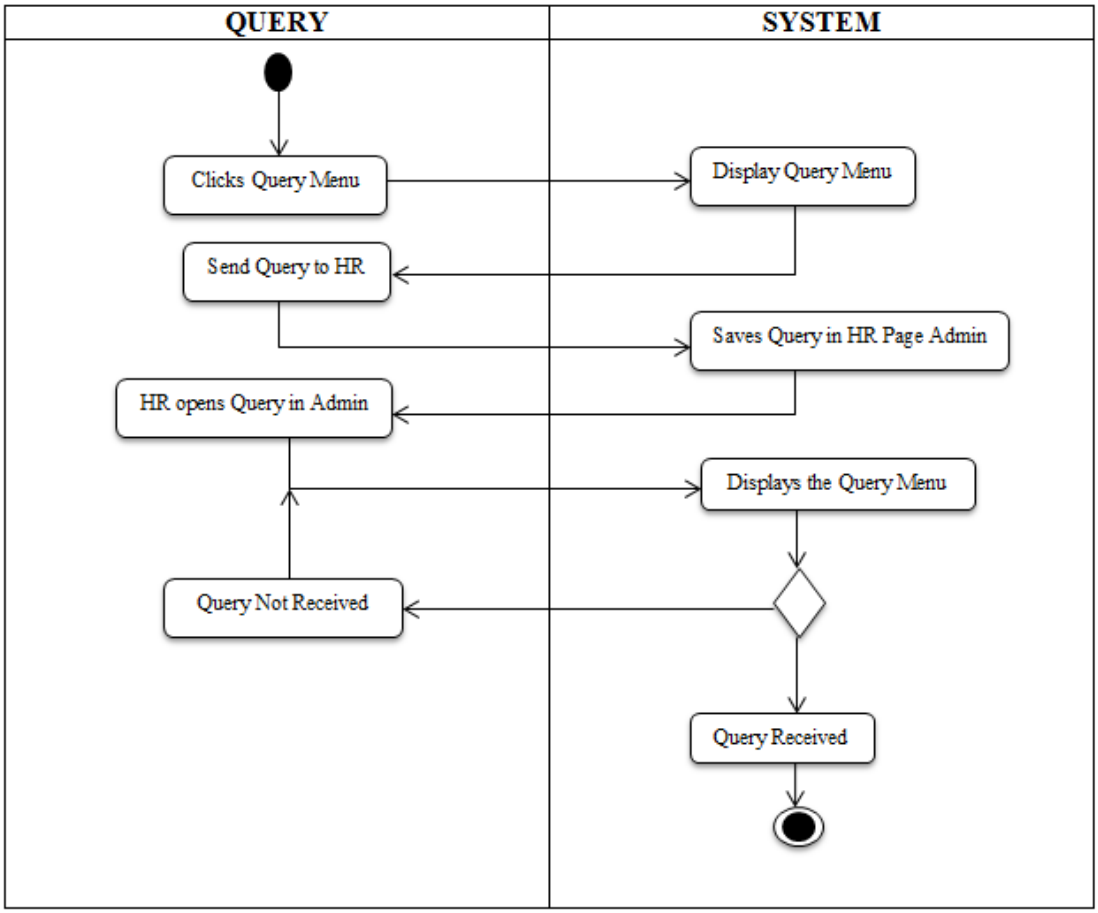


Figure 4.6 Activity Diagram of Query proposed

1. Class Diagram

Class diagrams aims to describe the static structure of classes in the system. Class used to represent something that is handled by the system. Following is the class diagram for the proposed Human Resource Management NewFix Limited.

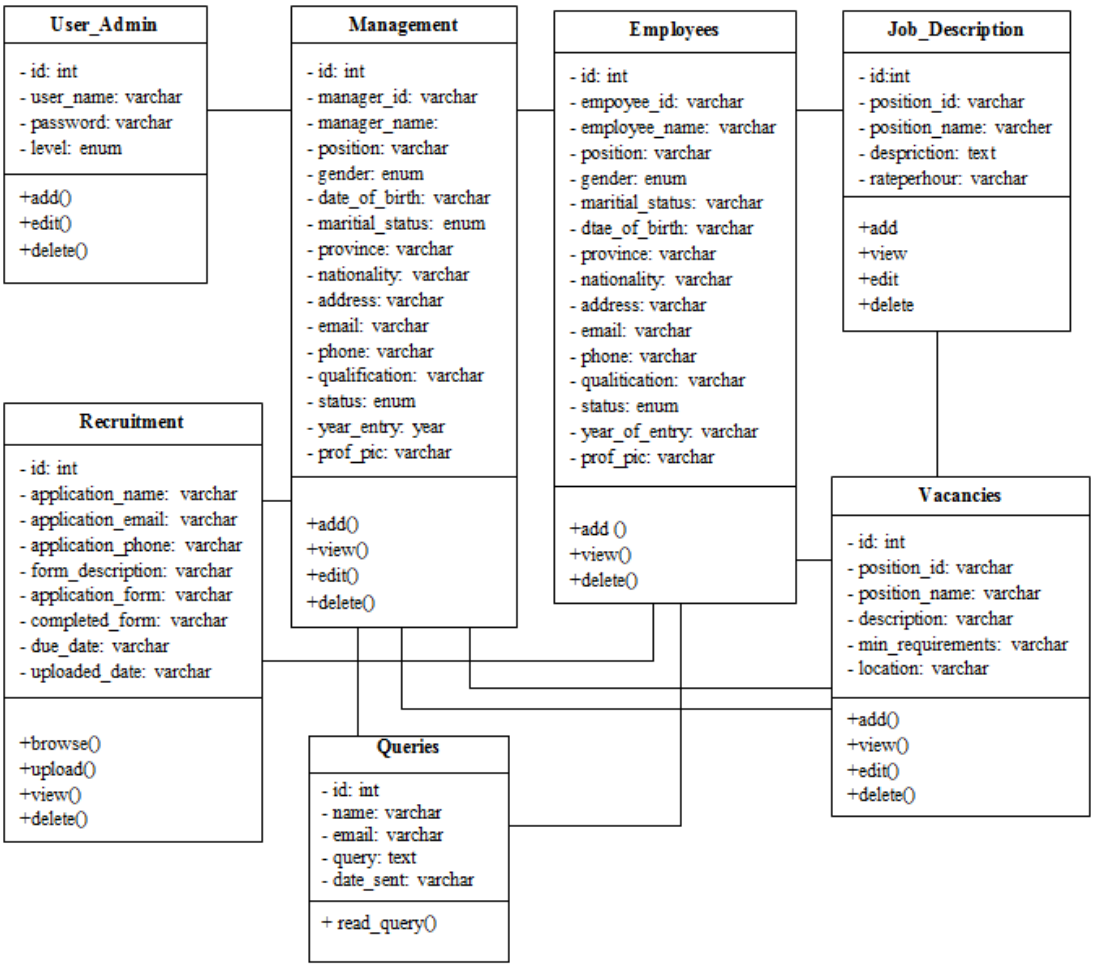


Figure 4.7 Class Diagram for HRM NewFix Tailoring Limited.

2. Deployment Diagram

Following is the deployment diagram which shows the physical infrastructure or the components of the proposed system, such as the hardware, machines, and servers.

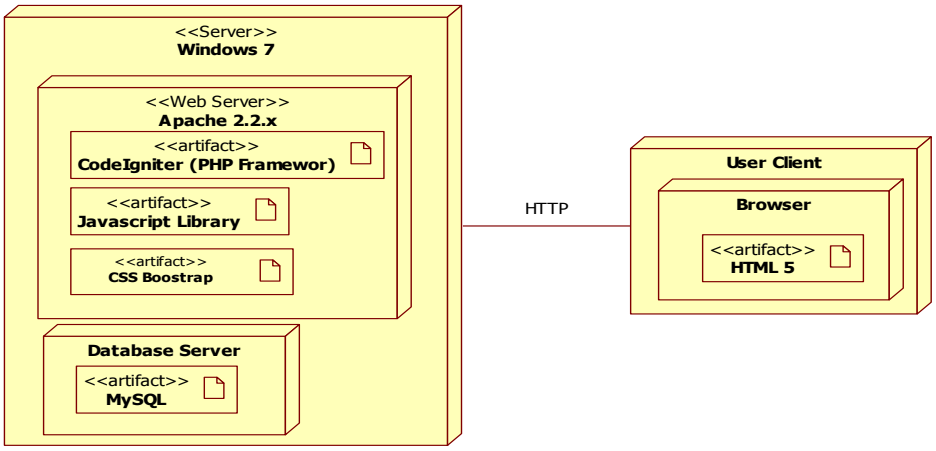


Figure 4.8 Deployment Diagram.

4.2 Implementation

The proposed web-based human resource management information system will be developed using the PHP programming language and it's database will be developed using MYSQL.

System implementation involves allowing the end users to use the system to see if it serves it's main purpose. By system implementation, the end users can test the system and then provide feedback so that the system developers can improve the system.

4.2.1 Implementation limits

The limit on the implementation of Human Resource Management information system of NewFix Limited based website are as follows:

1. Implementation of the application is given only three types of access that is the administrator the human resource manager, employees and the general public.
2. Implementation of this application is built specifically for employees working at NewFix Limited.

4.2.2 Software Implementation

Implementation of software is with a PC or laptop operating systems Windows, Mac, Ubuntu, Linux and connected to the Internet. The software implementation is as follows:

Implementation of software PC / Laptop:

1. Operating System Windows XP / 7 / Windows 8 ..
2. XAMPP 1.7.4 for Internet and local database storage.
3. Adobe Dreamweaver CS3, Sublime Text to write coding in PHP program.
4. CodeIgniter Framework 2.0
5. Mozilla Firefox 11 as a browser.

4.2.3 Hardware Implentation

To be able to run applications designed it takes hardware as a supporter. The hardware requirements are as follows:

Hardware implementation:

1. Processor: Intel (R) 2:10 GHz Core2Duo
2. Memory: 1024MB RAM
3. Hard drive: 250GB Seagate
4. VGA: Intel (R) HD Graphics
5. Monitor: 15 "Advance

4.2.4 Database Implementation (syntax SQL)

Database Implementation taken based on the design of a database created previously. The following table structure implemented in the database:

1. "employees"

```
CREATE TABLE IF NOT EXISTS `employees` (
        `id` int(11) NOT NULL AUTO_INCREMENT,
         `employee_id` varchar(20) NOT NULL,
         `employee_name` varchar(50) NOT NULL,
         `position` varchar(50) NOT NULL,
         `gender` enum('Male','Female') NOT NULL,
         `marital_status` enum('Married','Single') NOT NULL,
         `date_of_birth` varchar(20) NOT NULL,
         `province` varchar(50) NOT NULL,
         `nationality` varchar(50) NOT NULL,
         `address` varchar(50) NOT NULL,
         `email` varchar(50) NOT NULL,
         `phone` varchar(20) NOT NULL,
         `qualification` varchar(50) NOT NULL,
         `status` enum('not active','active') NOT NULL,
         `entry_year` year(4) NOT NULL,
         `pro_pic` varchar(50) NOT NULL,
         PRIMARY KEY (`id`)
       )
```

2. "job_description"

```
CREATE TABLE IF NOT EXISTS `job_description` (
        `id` int(11) NOT NULL,
         `position_id` varchar(20) NOT NULL,
         `position_name` varchar(50) NOT NULL,
         `description` text NOT NULL,
         `rateperhour` varchar(20) NOT NULL
       )
```

3. “management”

```
CREATE TABLE IF NOT EXISTS `management` (
        `id` int(11) NOT NULL AUTO_INCREMENT,
        `manager_id` varchar(20) NOT NULL,
        `manager_name` varchar(50) NOT NULL,
        `position` varchar(50) NOT NULL,
        `gender` enum('Male','Female') NOT NULL,
        `date_of_birth` varchar(15) NOT NULL,
        `marital_status` enum('Married','Single') NOT NULL,
        `province` varchar(50) NOT NULL,
        `nationality` varchar(50) NOT NULL,
        `address` varchar(50) NOT NULL,
        `email` varchar(50) NOT NULL,
        `phone` varchar(20) NOT NULL,
        `qualification` varchar(50) NOT NULL,
        `status` enum('active','not active') NOT NULL,
        `entry_year` year(4) NOT NULL,
        `pro_pic` varchar(50) NOT NULL,
        PRIMARY KEY (`id`)
       )
```

4. “queries”

```
CREATE TABLE IF NOT EXISTS `queries` (
        `id` int(11) NOT NULL AUTO_INCREMENT,
        `name` varchar(50) NOT NULL,
        `email` varchar(50) NOT NULL,
        `query` text NOT NULL,
        `sent_date` varchar(20) NOT NULL,
        PRIMARY KEY (`id`)
       )
```

5. “recruitment”

```
CREATE TABLE IF NOT EXISTS `recruitment` (
        `id` int(11) NOT NULL AUTO_INCREMENT,
        `applicant_name` varchar(50) NOT NULL,
```

```
`applicant_email` varchar(50) NOT NULL,
`application_phone` varchar(50) NOT NULL,
`form_description` varchar(200) NOT NULL,
`application_form` varchar(50) NOT NULL,
`completed_form` varchar(50) NOT NULL,
`due_date` varchar(20) NOT NULL,
`uploaded_date` varchar(20) NOT NULL,
PRIMARY KEY (`id`)
)
```

6. "users"

```
CREATE TABLE IF NOT EXISTS `users` (
`id` int(11) NOT NULL AUTO_INCREMENT,
`username` varchar(50) NOT NULL,
`password` varchar(50) NOT NULL,
`level` enum('1','2') NOT NULL,
 PRIMARY KEY (`id`)
)
```

7. "vacancies"

```
CREATE TABLE IF NOT EXISTS `vacancies` (
`id` int(11) NOT NULL AUTO_INCREMENT,
`position_id` varchar(50) NOT NULL,
`position_name` varchar(50) NOT NULL,
`description` varchar(300) NOT NULL,
`min_requirements` varchar(300) NOT NULL,
`location` varchar(50) NOT NULL,
PRIMARY KEY (`id`)
)
```

4.3 Implementation Interface

Before the admin can access the admin dashboard, he must fill in his user details and log into the system.

a. Login

An initial appearance after opening the E-Learning application, the user must first be entered on the account login form Secretari at Prodi, then enter your Username and Password and then directly enter the main menu by selecting the Submit button.

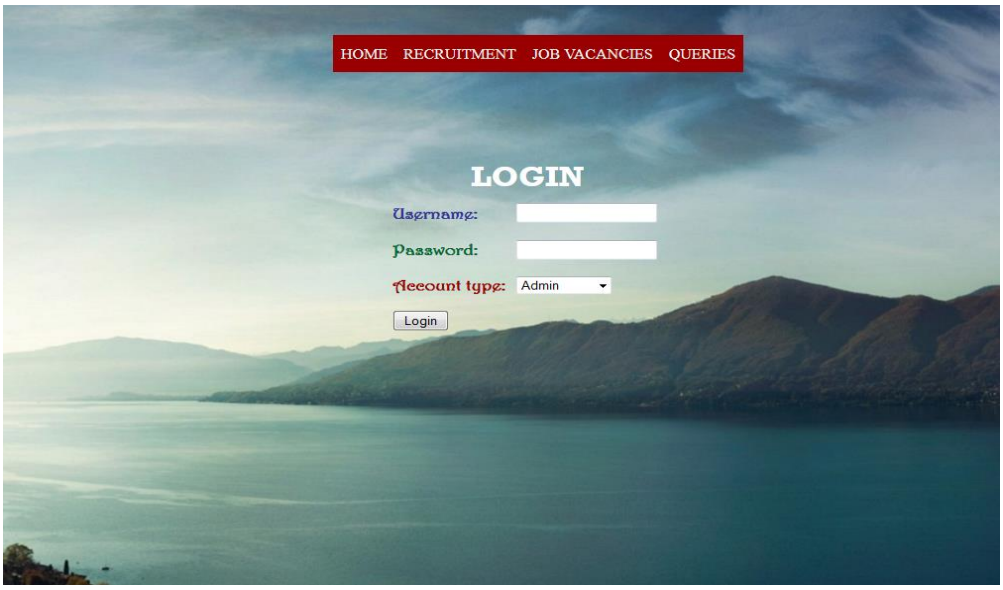


Figure 4.9 Admin Login page.

Once the admin is logged in successfully then he can access the main page.

b. Admin Dashboard

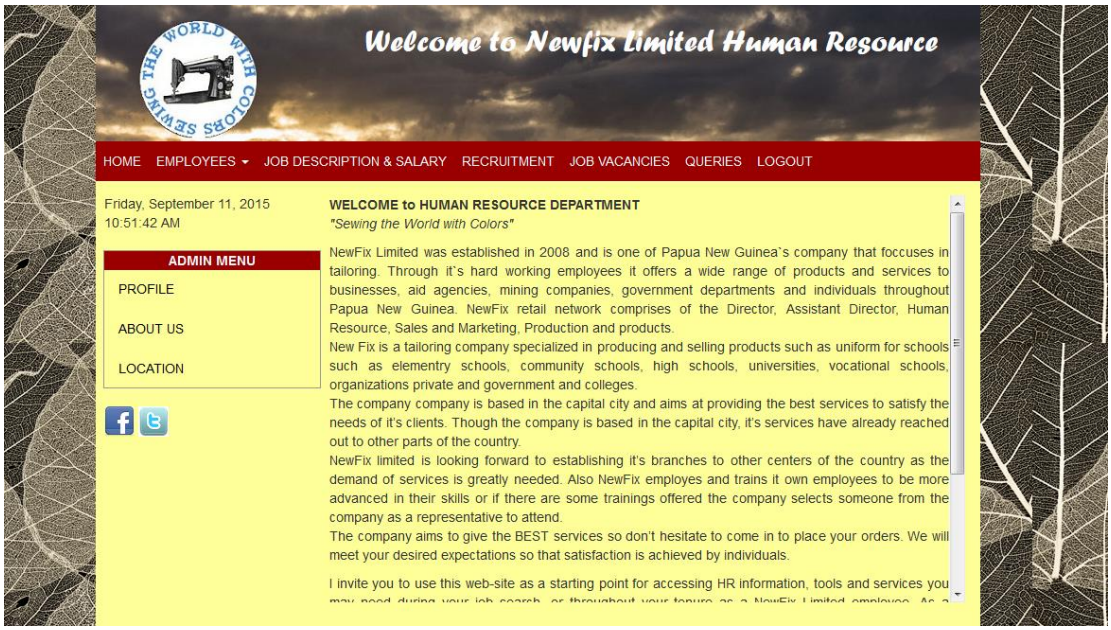


Figure 4.10 Admin Dashboard

c. Manageral Employee Menu

In this menu provides for the adding, editing, viewing and deleting of managers profile.



Figure 4.11 Manageral Employee Menu

d. Ordinary Employees Menu.

In this menu provides for the adding, editing, viewing and deleting of ordinary employees profile.



Figure 4.12 Ordinary Employees

e. Job Description and Salary

In this menu shows the Job Description and Salary rate per fortnight.



Figure 4.13 Job Description and Salary

f. Recruitment Menu

In recruitment menu shows where to upload application forms, shows list of uploaded applications and to download application forms.

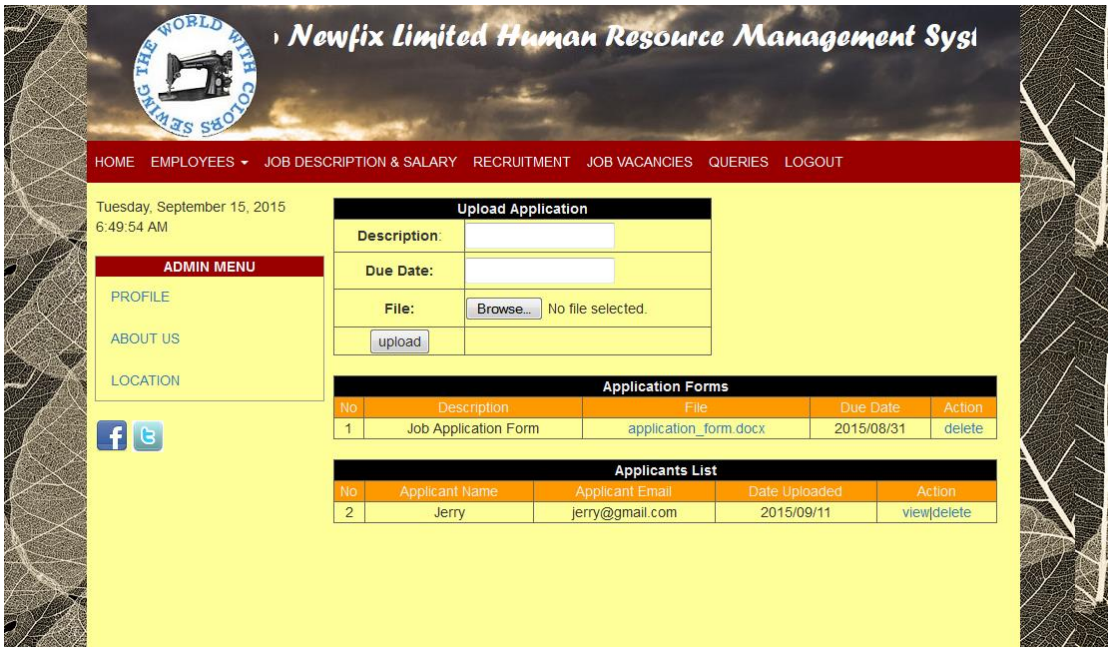


Figure 4.14 Recruitment

g. Job Vacancy.

In this menu shows the different jobs available for applying.

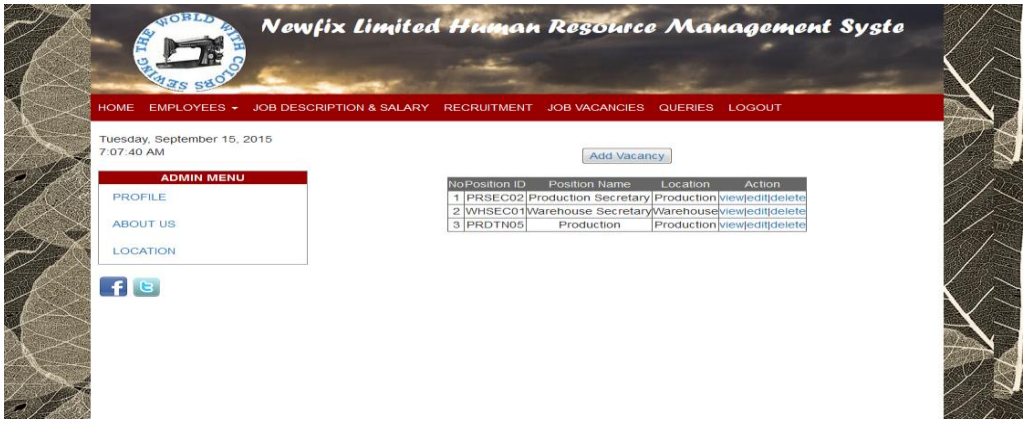


Figure 4.15 Job Vacancy

h. Query Menu

In this menu is where the sent query is saved for the admin to read.



Figure 4.16 Query

4.4 Testing

After implementation of the system, tests were carried out to check the functionality of the system. In this study the black box method were used to carry out testing.

4.4.1 Testing plan

Given below are the following test results from the testing of the NewFix Limited Human Resource Management Information System.

a. Tabel 4.5 Testing Plan Admin Page.

No	The Component Tested	Submenu	Scenario Test Item	Testing Results
1	Display Admin Login		Displays admin user login	BlackBox
2	Admin Account menu	Employee	Displays the name lists of employees for view, editing and deleting.	BlackBox
			Displaying a button for adding new employees	BlackBox
		Job Description and Salary	Displaying displays a button for adding the types of job in NewFix Limited	BlackBox
			Displaying jobs with it's position and id	BlackBox
		Job Vacancy	Displaying a vacancy button for adding new vacant jobs	BlackBox
			Displaying a table showing positin id, position name, location of job within the firm and the action to be taken.	BlackBox
		Manageral Employee	Display add manager button for adding new manager.	BlackBox
			Displays the table list of managers.	BlackBox
		Query	Displays a table list of queris been sent in to read. Also shows the name of person sending the query, the date and email	BlackBox

		Recruitment	Displays a table for uploading application form	BlackBox
			Displays a table for downloading application form	BlackBox
			Displaying a table showing the list of applicants.	BlackBox

b. **Table 4.6** Testing Plan Employee Account

No	The Component Tested	Submenu	Scenario Test Item	Testing Results
1	Display user Login Employee		Displays employee user login	Blackbox
2	Main Menu Employee	Managerial Employees	Displays table lists of names of managers only for viewing	Blackbox
		Ordinary Employees	Displays only the name of employees and has only a view button to view profile.	Blackbox
		Job Description and salary	Displays list's of jobs with position ID	Blackbox
		Recruitment	Displays a table which application form can be downloaded	blacbox
			Displays applicant lists.	

		Job Vacancy	Display list of vacant jobs.	Black box
		Query	Display's a menu for writing query to send to the admin	Black box

c. Tabel 4.7 Testing Plan Employee Page

NO	The Component Tested	Submenu	Scenario Test Item	Testing Results
1	Display user Login Employee		Displays the login form to the user employee	Blackbox
2	Employee page	Ordinary Employee	Display the list of employees in table form	blacbox
		Employee	Displays data for employee	blacbox

4.5 Cases and Test Results

Based on the testing method above, the following is a case to test the proposed system.

a. Tabel 4.8 Cases and Test Results for admin account.

No	Menu	Test Cases	Scenario Test Item	Expected Results	Testing Results
1	Admin login	Display user Login	Selecting a login form to log in	When you first open the app will bring up the login form to the user	[ ] Accepted [ ] Denied

2	Employees	Display Manageral Employees	Select add, view, edit, delete.	When choosing add a new manager profile is created, when selecting view a profile is been seen, select edit to edit profile and select delete to delete profile.	[ ] Accepted [ ] Denied
		Display Ordinary Employees.	Select add, view, edit, delete.	When choosing add a new employee profile is created, when selecting view a profile is been seen, select edit to edit profile and select delete to delete profile.	[ ] Accepted [ ] Denied
3	Job Description and Salary	Display the Job Description and Salary	Select add, view, edit and delete	When selecting add a new job is added, view to see the job description, edit when there is an error with the description and delete if job occupied	[ ] Accepted [ ] Denied
4	Recruitment	Display the recruitment page	View browser and upload	When clicking on browser brings you to the application form than click on the form and upload	[ ] Accepted [ ] Denied
			View application form doc	When selecting the application form doc will see the uploaded application form	[ ] Accepted [ ] Denied
			View and delete	When selecting view the application form is viewed and when selecting delete the form is been deleted	[ ] Accepted [ ] Denied
5	Job Vacancies	Display Job Vacancies	Viewing add, view, edit and delete.	When selecting add, a new job vacancy is been add, select	[ ] Accepted [ ] Denied

				view for viewing vacant jobs, select edit if wrong job been added and to select delete to delete the vacant job displayed.	
6	Queries	Display Queries	View Read Query	When selecting read query, the queries been sent in will be read.	[ ] Accepted [ ] Denied

b. Tabel 4.9 Cases and Test Results for employee account

No	Menu	Test Cases	Scenario Test Item	Expected Results	Testing Results
1	Employee	Display user Login	Select Employee	Automatically shows managerial employees and Ordinary employees	[ ] Accepted [ ] Denied
2	Managerial Employees	Display Managerial Employees	Display table with view button on every managerial employees	When selecting view displays a managers employee profile	[ ] Accepted [ ] Denied
3	Ordinary Employee	Display ordinary Employees	Display table with view button on every ordinary employees	When selecting view displayes ordinary employee profile	[ ] Accepted [ ] Denied

c. **Tabel 4.10** Cases and Test Results for Employee page

No	Menu	Test Cases	Scenario Test Item	Expected Results	Testing Results
1	Employee	Display user Login	Choosing a login form to the user	When you first open the app will bring up the login form to the user	[ ] Accepted [ ] Denied

2	Manageral Employee	Display Manageral Employee page	Select a Manageral Employee	When selecting and clicking on the view button of a particular employee will show the history/profile of the manageral employee.	[ ] Accepted [ ] Denied
3	Ordinary Employee	Display Ordinary Employee page	Selecting a Ordinary Employee	When selecting and clicking on the view button of a particular employee will show the history/profile of the Ordinary employee.	[ ] Accepted [ ] Denied

4.5.1 Conclusion Results of Testing

From the results gathered from the testing of the above cases, it can be concluded that the system is functioning well and thus is free from errors.