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Design and Implementation of a web based Human Resource Information System for the CSIR-Food Research Institute

KWABENA A. BUGYEI AND RAPHAEL K. KAVI

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CSIR-FOOD RESEARCH INSTITUTE | P.O. Box M20, Accra

ABSTRACT

Employees are the backbone of any company, therefore their management plays a major role in deciding the success of an organization. A flexible and easy to use Human Resource Information System solution for small and medium sized companies provides modules for personnel information management thereby organizations and companies are able to manage the crucial organizational asset – people. The combination of these modules into one application assures the perfect platform for re-engineering and aligning Human Resource processes along with the organizational goals. This system brings about an easy way of maintaining the details of employees working in any organization.

The goal of this project is to design, develop and implement a web based human resource information system for the CSIR-Food Research Institute to fill the existing gaps in the electronic management of employees and to streamline the management of human resources. The system is implemented using a 3-tier approach with a backend database (MySQL database), a middle-tier of Apache and PHP and a front-end web browser (client). The report also discusses each of the underlying technologies used to create and implement the application.

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List of Abbreviations and Acronyms

HRIS- Human Resource Information System

EMS- Employee Management System

HRMS – Human Resource Management System

HR - Human Resource Manager

HOD - Head of Division

ESS- Employee Self-Service

ERP – Enterprise Resource Planning

WBS – Work Breakdown Structure

FRI- Food Research Institute

CSIR- Council for Scientific and Industrial Research

1.0 CHAPTER ONE: INTRODUCTION

1.1 Overview of CSIR- Food Research Institute

The Food Research Institute (FRI) is one of the thirteen (13) Research Institutions of the Council for Scientific and Industrial Research, (CSIR) which operates as a Science and Technology Research Development Organisation. The Food Research Institute was established in October 1963, incorporated by L I No. 438 of 19th March 1965 and became an institute of CSIR in October, 1968 by NLC Decree 293.

CSIR-FRI is mandated to conduct market-oriented applied research, provide technical services and products to the food industry and assist in poverty alleviation through the creation of opportunities for income generation, thus contributing to food security and foreign exchange earnings. CSIR-Food Research Institute is the leading S&T Institute in the transformation of the food processing industry in Ghana.

The core research interests and programs of the FRI include:

- Root and Tuber Products Programme
- Meet, Fish, Poultry and Dairy Products Programme
- Cereal and Grain Legume Products Programme
- Fruit and Vegetable Products Programme

1.1.1 Vision

The Institute`s vision is to play a key role in the transformation of the food processing industry and to be internationally competitive with particular reference to product safety, quality and preservation.

1.1.2 Mission

The Institute`s mission focusses on providing scientific and technological support to the growth of the food and agricultural sectors of national economy in line with corporate priorisation and national objectives. Primarily, the Food Research Institute`s mission is to conduct market-oriented applied research and provide technical services and products profitably to the private sector and other stakeholders.

1.1.3 Core Mandate

The CSIR-FRI conduct applied research into problems of:

- Food processing and preservation
- Food safety and storage
- Food marketing, distribution and utilisation
- National food and nutritional security in support of the food industry
- Advice Government on its food policy
- To assist in poverty alleviation through creation of opportunities for generating and increasing income within the micro, small, medium and large-scale food industries
- In support of the food and agricultural sectors of the national economy

1.1.4 Core Values

CSIR-Food Research Institute believes and ascribes to the following values:

- Professionalism
- Team work
- Innovativeness
- Competitiveness
- Quality Delivery

1.2 Project Background

Employees are the backbone of any company, therefore their management plays a major role in deciding the success of an organization. Human resource management information system application makes it easy for the employer to keep track of all records. This system allows the administrator to edit employee's records, add new employee's records as well as evaluate an employee's performance. Employees can be managed efficiently without having to retype back their information in the database.

A flexible and easy to use human resource software solution for small and medium sized companies provides modules for personnel information management thereby organization and companies are able to manage the crucial organization asset – people (SyedNavaz et al, 2013). The combination of these modules into one application assures the perfect platform for re-engineering and aligning human resource processes along with the organizational goals. This system brings about an easy way of maintaining the details of employees working in any organization.

It is simple to understand and can be used by anyone who is not even familiar with simple employees system. It is user friendly and just asks the user to follow step by step operations by giving easy to follow options. It is fast and can perform many operations for a company.

1.3 Problem Statement

Manual handling of employee information poses a number of challenges. This is evident in procedures such as leave management, where an employee is required to fill in a form which may take quite some time for it to be approved. The use of paper work in handling some of these processes could lead to human error, papers may end up in the wrong hands and not forgetting the fact that this is time consuming. A number of current systems lack employee self-service, meaning employees are not able to access and manage their personal information directly without having to go through the HR units of the Administration. Another challenge is that there is no central repository where all employee information are stored making it difficult to access these information from remote places when the need arises.

The aforementioned problems can be tackled by designing and implementing a web based HR information system. This system will maintain employee information in a fully secure database that can be accessed anytime anywhere by authentication and authorization only.

1.4 Objectives

In this world of growing technologies everything has been computerized. With large number of work opportunities the Human workforce has increased. Thus there is the need for a system which can handle the data of such a large number of Employees. This project simplifies the task of maintaining records because of its user friendly nature.

The objective of this project was to provide a comprehensive approach towards the management of employee information. This will be done by designing and implementing a web-based HR information system that will bring about a major paradigm shift in the way employees' information are handled in the FRI.

The specific objectives of this system include:

- Design of a web based HR information system to fulfill requirements such as employee personal records management, leave management, report generation to assist in performance appraisal, workshops and conferences management, job application management, local and international travels management, project management, ESS and employee trainings.
- Well-designed database to store employee information.
- A user friendly front-end for the user to interact with the system.

1.5 Scope of the Project

The scope of this project will be limited to the following:

- Employee profiles: Employees will have access to their personal profiles and will be able to edit their details.
- Electronic leave application: Complete elimination of paperwork in leave management by enabling an employee apply for leave as well as check their leave status through the system. This will also enable the HR manager to accept/reject leave application through the system
- Project Management: Assign tasks and projects to employees, assign a project team and keep track of progress.
- Report generation: The HR manager will be able to generate timely reports in order to monitor employees and this can be used for performance appraisals. The reports will have all the information of an employee from educational background, trainings attended, leave information, workshop and conferences attended, trek information, projects done as well as technical skills.
- Recruitment Process: The admin will add an employee and a default password and employee id will be generated and sent to the new employees email. The HR manager will then have the ability to add an employee's information to the database.

1.6 Expected Benefits

This system is expected to be user friendly and will offer easy access to data as well as services such as online leave management, e-recruitment, and timely report generation, monitoring employee trainings, task management, project management and employee tracking among others.

The employee is expected to have direct interaction with this system through a password protected user account, therefore the proposed system is a web based to enable accessibility from any location as long as internet connectivity is available. This direct interaction with the system will enable employee self-service.

Without a human resource information system, it's a tedious job for the human resource unit to keep track of each and every employee and to retrieve employee information quickly. The HR information system will be developed to provide timely and accurate information of employees at the click of a button.

1.7 Requirements and Constraints

1.7.1 Functional Requirements:

Authentication

- Log in- The user can log in to the HRIS with his/her username and password.
- Log out- The user can logout from the HRIS.
  Log in failure- If the user does not exist in the database or the user has not yet been authorized by the HRIS admin.

Authorization

- User role check- After logging in, the user role will be checked from the database and the user interface will be displayed according to their role.

Process Data

- Display- User with defined roles can display the content of the database. To be specific, employee can only view his/her personal information. HOD can see his/her personal information as well as employee's who are in his/her division. Admin and HR can display their personal information and all employees' information.
- Edit- A user with employee role can edit his/her specific personal information. HOD can only edit employees' personal information that is under his/her coverage except user role type. Admin can edit all information related to all employees' including their user role type.
- Search- User with HOD role can search the content of database for the employees' who are under his/her coverage. HR and admin roles can search all the employees' information in the database. Search feature works on specific keywords showing employee's characteristics, peculiarities, skills, features etc. For example, HR wants to find employees' who are well trained in "Cassava Processing". He/she will write the specific keyword in the search bar and press the available search button. Afterwards, he/she will find a list of all the employees' who know "Cassava Processing".
- Update authentication- This feature can be used only by admin role type. Admin can update the role type of a specific user. For example, an employee got promotion and his role type will be changed from employee role id to HOD role. Admin will be able to update this authentication mechanism.

Leave Application/Approval

- Leave application- The user can be able to fill in leave application form in the appropriate fields.
- Leave approval- The admin can be able to approve leave applications based on the reasons stated, length of leave as well as available staff at the division.

Leave days accrued- The user shall be able to check the number of leave days accrued.

Recruitment

- Add new employee- HR role type is able to add a new employee to the database. The new employee will have all the required personal information related to him/her. The new created employee will have an id.

- Add a new user- After a new employee has been created by HR role, admin role is responsible for creating a new user by the specified id assigned in the “Add a new employee” feature. The unique id will be given by the system. Admin will assign a new role such as employee, HOD, HR, and admin to the new created user.
- Add prospective employee-HR shall be able to add prospective employee information
- Add National Service Personnel and Attachment Students-HR shall be able to add information about National Service Personnel as well as Attachment Students.

Report generation

- Report generation- HR shall be able to generate a report in pdf, excel or word format for each employee based on the information in the database.

Project Management

- Create project team: The HOD of a division or project manager shall be able to create a project and come up with a project team.
- Work Breakdown Structure (WBS): The HOD or project manager shall be able to assign tasks to the project team as well as monitor their progress.

Trainings and Task Management

- Trainings: The HOD shall create trainings and assign employees that are required to attend the trainings as well.
- Tasks: HOD shall assign tasks to employees in his/her division.

Workshops and Conferences

- HR shall create and track all workshops and conferences attended by employees

Local and International Travels

- HR shall be able to track employees’ local and international travels (trek information).

1.7.2 Non-Functional Requirements:

Performance requirements

There are no restrictions on the number of users to be added to the database.

Hardware requirements

The system should be able to work on a computer with the following minimum hardware specifications:

OS: Windows XP/Vista/7/8 and Linux

CPU: Pentium III (700MHz) and above

Memory: 1GB and above

Hard drive capacity: 10GB of hard drive and above

Others: Network interface card, mouse, keyboard, and monitor.

Software requirements

Since HRIS is a web-based application, internet connection must be established.

The HRIS software database model will support MySQL environment as Database Management System (DBMS).

The web server and the programming language will be Apache web server and PHP respectively.

1.8 Summary

This chapter began by giving a brief overview of CSIR- Food Research Institute, the background to the entire project, the objectives and scope of the project. It also gave the problem definition and

highlighted the current problems faced with the use of the systems that are in place and outlines briefly the solution system to be developed. The next chapter will focus on the literature review.

2.0 CHAPTER TWO –LITERATURE REVIEW

2.1 Introduction

This chapter presents a brief literature relevant to the Human Resource Information System. It examines theories, concepts, approaches, methods and techniques relevant to the project. Similar existing technologies relating to the development of the HRIS are also discussed.

2.2 Human Resource and Information Technology

A HRIS refers to the systems and processes at the intersection between human resource management (HRM) and information technology. It merges HRM as a discipline and in particular it's basic HR activities and processes with the information technology field whereas the programming of data processing systems evolved into standardized routines and packages of enterprise resource planning (ERP) software (Bulmash, 2009).

An organization or company with a very large number of employees manages a greater volume of data. This activity can be daunting without a more sophisticated tool to store and retrieve data. The various levels of sophistication can be examined by looking at the evolutionary aspects of HR technology. These aspects can be characterized into four stages of development: Paper-based systems, early personal computer (PC) technology, electronic databases, and Web-based technology (TECH HRM, 2014).

The benefits of automation are becoming widely known to HR and other areas of the business. The focus has shifted to automating as many transactions as possible to achieve effectiveness and efficiencies.

The technology of the future will be about speedy access to accurate current information, and reliability to access this information via multiple systems will give organizations a strategic edge. HR is expected to relinquish its role as sole owner of HR information, so that managers and employees can use this information to solve their own problems using Web-based systems. This new system will not necessarily mean reduction in HR staff. The new system will enable HR professionals to focus on transforming information into knowledge that can be used by the organization for decision making; it will be about HR and IT working together to leverage this technology. A recent study by the Hackett

Group, a business process advisory firm found that high-performing organizations spend 25 percent less than their peers on HR because they use technology effectively (Renae and Boudreau, 1992).

The two most popular Web-based HR applications used today are self-service for employees and self-service for managers. These applications have enabled companies to shift responsibility for viewing and updating records onto individual employees and have fundamentally changed the manner in which employees acquire information and relate to their HR departments.

2.3 Software Methodologies

A software development methodology is a collection of procedures, techniques, tools, and documentation aids which will help the systems developers in their efforts to implement a new information system.

There are a number of software development methodology each of which are adopted based on a number of factors relating to the project e.g. time, cost, incorporation of requirement changes during the development process, system complexity, communication between customers and developers, software criticality, size of the development team. These generic models are not definitive descriptions of software processes. Rather, they are abstractions of the process that can be used to explain different approaches to software development. You can think of them as process frameworks that may be extended and adapted to create more specific software engineering processes. Below are a selected number of models:

The Waterfall Model

The waterfall model is a sequential design process, often used in software development processes. It takes the fundamental process activities of specification, development, validation, and evolution and represents them as separate process phases such as requirements specification, software design, implementation, testing, and so on (Sommerville, 2011).

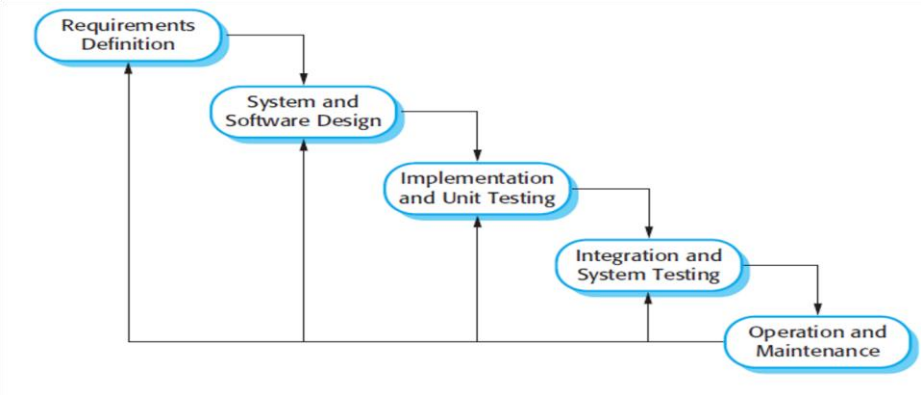

Figure 2.1 the Waterfall Model

Incremental Model:

This approach interleaves the activities of specification, development, and validation. The system is developed as a series of versions (increments), with each version adding functionality to the previous version.

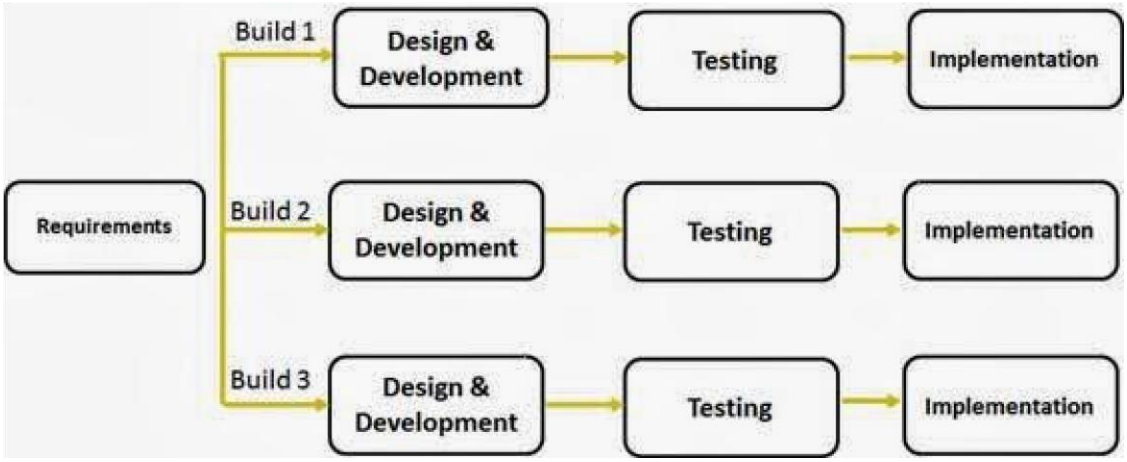

Figure 2.2 Incremental Model

Reuse-oriented methodology:

This approach is based on the existence of a significant number of reusable components. The system development process focuses on integrating these components into a system rather than developing them from scratch.

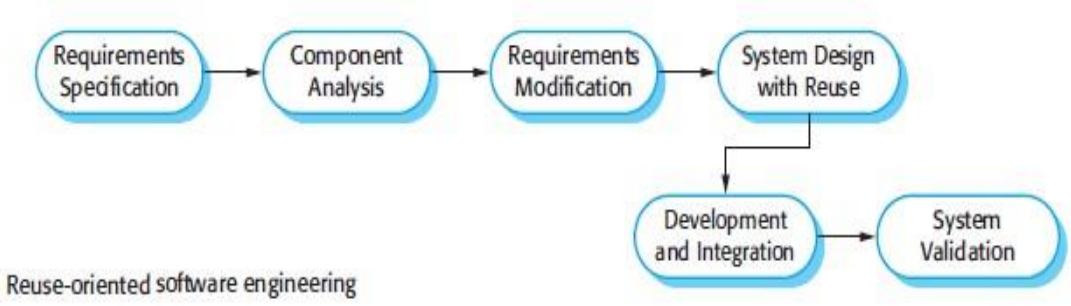

Figure 2.3 Reuse-oriented software engineering

2.4 Software Development Tools

The following are various development tools and software that could be used for the system.

2.4.1 Back-end Technology

Java Server Pages

Java Server Pages (JSP) is a technology that helps software developers create dynamically generated web pages based on HTML, XML, or other document types. Released in 1999 by Sun Microsystems JSP is similar to PHP, but it uses the Java programming language.

To deploy and run Java Server Pages, a compatible web server with a servlet container, such as Apache Tomcat or Jetty, is required (Wikipedia, 2014).

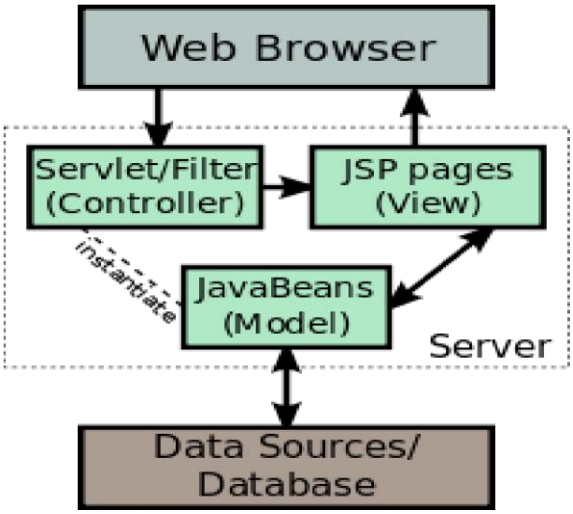

Figure 2.4 The JSP Model 2 architecture

ASP.NET

ASP.NET (Active Server Pages .NET) is a proprietary scripting language or application framework developed by Microsoft used to create enterprise wide web applications which can be accessible globally. ASP.NET:

- Drastically reduces the amount of code required to build large applications.
- The HTML produced by the ASP.NET page is sent back to the browser. The application source code you write is not sent and is not easily stolen
- ASP.NET makes for easy deployment. There is no need to register components because the configuration information is built-in
- ASP.NET validates information (validation controls) entered by the user without writing a single line of code.

ASP.NET makes development of any web based application or system easier and faster as it allows developers to drag and drop components and specify their functions while code is automatically generated, as a result of this ease, complex applications can be developed in a short period of time even by programmers who are not too familiar with the language. Despite ASP.NET being robust it has also proven to be more expensive to implement and the fact

that it's not platform independent, limits the number of places in which it can be used (ASP.NET, 2010).

PYTHON

Python is a widely used general-purpose, high-level programming language. Its design philosophy emphasizes code readability, and its syntax allows programmers to express concepts in fewer lines of code than would be possible in languages such as C. The language provides constructs intended to enable clear programs on both a small and large scale.

Python supports multiple programming paradigms, including object-oriented, imperative and functional programming or procedural styles. It features a dynamic type system and automatic memory management and has a large and comprehensive standard library.

Like other dynamic languages, Python is often used as a scripting language, but is also used in a wide range of non-scripting contexts. Using third-party tools, such as Py2exe or Pyinstaller, Python code can be packaged into standalone executable programs. Python interpreters are available for many operating systems (Zhiming, 2002).

PHP

PHP (Hypertext Preprocessor) is an open source server side scripting language, it is platform independent, meaning it can work on all major operating systems. PHP supports many types of databases including MySQL and is supported by a large community of users and developers. PHP is an excellent choice for developing web based systems because it's an open source technology and has a large community of users and developers, this makes PHP a language that is easy to learn and understand, furthermore coding solutions and bugs are resolved quickly. The fact that PHP is platform independent gives the developer the freedom to develop an application without worrying about the operating system on a user's machine. PHP has the ability to integrate with most web technologies thus it can be used as middleware (Manuel and Palacio, 2010).

2.4.2 Database Management Systems

MySQL

MySQL is an open source database that is platform independent and can easily interface with a number of scripting languages, it works best with PHP though. The number of advantages of using MySQL which include, the ability to handle stored procedures, triggers, SQL and User Defined functions. It also offers a high-speed data load utility and support for various drivers (ODBC, JDBC, .NET, PHP).

Deploying a MySQL database has proved to be cheap and easy as it doesn't require special hardware or software requirements, it can work well on any web server but most professionals recommend the apache web server. MySQL is an excellent database to use when developing web based applications because its platform independent and can easily interface with a number of scripting languages.

MS SQL (Microsoft SQL Server)

Microsoft SQL Server is Microsoft's relational web hosting database used to store website information like user information, it's mostly used on windows servers and it is not free. It has advanced features such as buffer management, logging and transaction, concurrency and locking, replication services, integration services, stored procedures and triggers. MS SQL databases work well with ASP.NET and also integrate well with other Microsoft products. MS SQL has been used to support large enterprise applications worldwide, its most common use is to store data for Customer Relationship Management(CRM) systems in large organization that need to keep track of their customers data for example mobile phone service providers, this database though is not platform independent and is also expensive to implement. A lot of web based help desk systems around the world created using ASP.NET or C# are all supported by MS SQL database.

Oracle Database

Oracle database is a powerful relational database management system that has a number of features. In today's market, oracle database management systems are one of the most popular

and full featured databases. Oracle databases are widely used as backend database systems for most enterprise applications because they are robust and secure. Oracle is a power hungry database that requires a lot of system resources to function properly. One of its major advantages is that it is platform independent. An Oracle database will work well with any web based system as long as there are enough resources required for it to run on.

2.5 Review of Popular HRIS Software

OrangeHRM

OrangeHRM is a powerhouse human resources tool that any small or mid-size business can take advantage of. With OrangeHRM, you have options: you can download and install the system on your own hardware, or you can purchase a hosted solution.

OrangeHRM's features include: fully modular, add-ons (e.g., benefits, employee self-service, training, budget, job and salary history, etc.) for purchase, all standard HR functions (employees, leave, benefits, performance, etc.), and more.

The installation is fairly straight-forward. With a self-extracting Windows installer or full-source installations for Windows, Mac, and Linux, you can get OrangeHRM up and running on nearly every platform. If you don't have the hardware or the skills to set up Orange onsite, you can request a quote for a hosted instance of OrangeHRM. You can also purchase support plans and customizations.

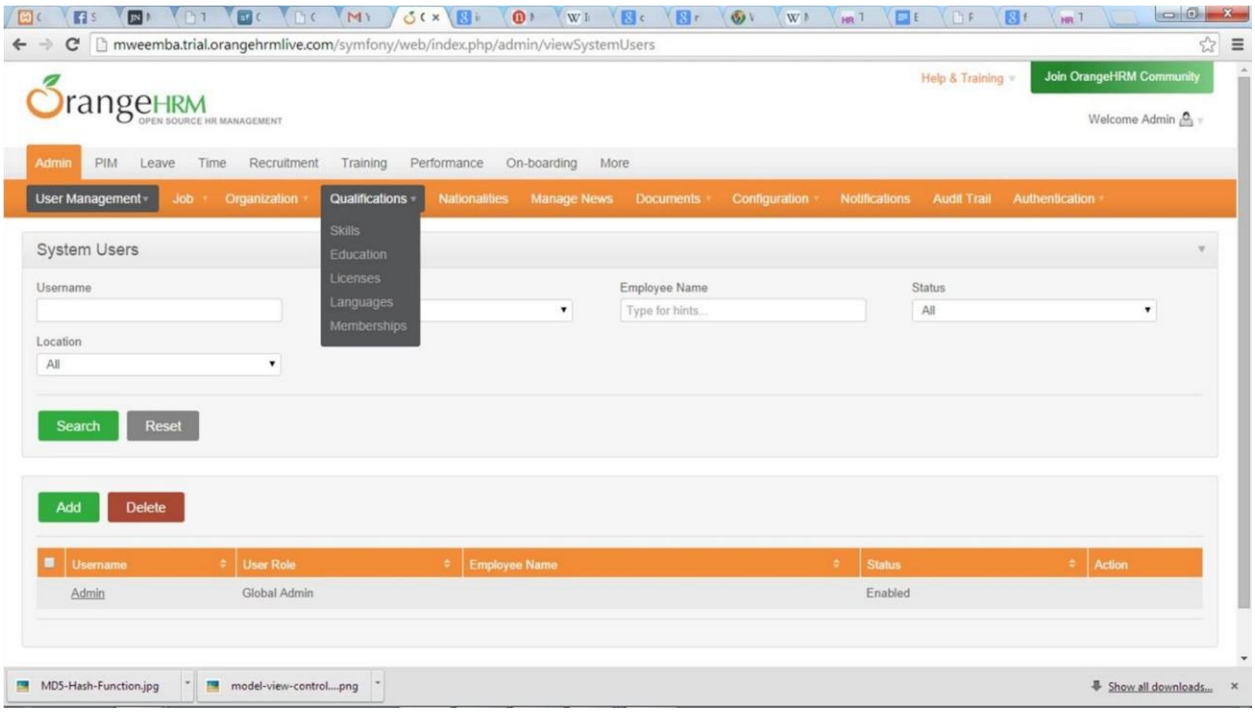

Figure 2.5 Snapshot of OrangeHRM interface

SimpleHRM

SimpleHRM offers an open source version of its professional platform. This version offers time management, and it can be installed on either a WAMP (Windows Apache MySQL PHP) or LAMP (Linux Apache MySQL PHP) server.

Once installed, SimpleHRM offers every feature you need to solidify your HRM department: employee information, leave management, travel management, expense management, benefit management, and task reporting. SimpleHRM allows you to assign a CV to an employee and define eligibility for rehire. Each major module offers plenty of granular control, and the user interface is well laid out.

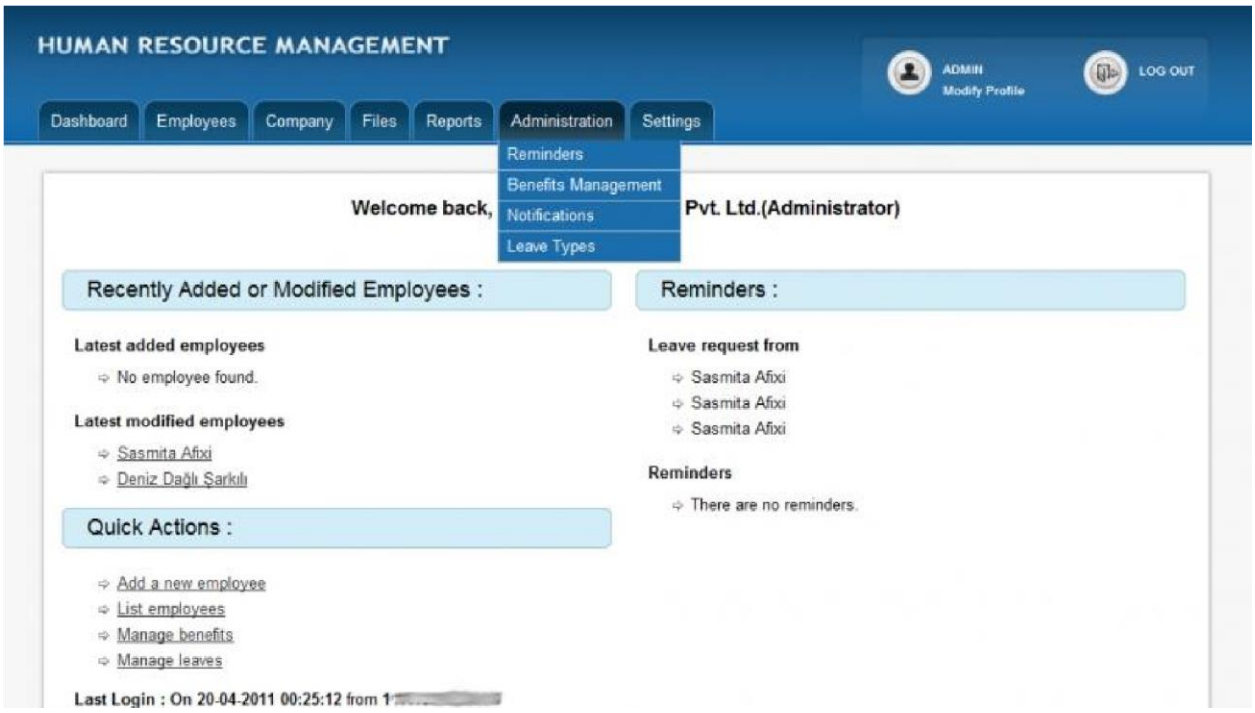

Figure 2.6 Snapshot of SimpleHRM interface

Waypoint HR

WaypointHR is the HR software for any small or midsize company looking for a platform that nearly any user of any experience level can use. WaypointHR can manage employee data, which include:

- Personal details
- Holiday/sickness/absence history
- Employment/contract/job/salary details
- Discipline and grievance records
- Performance appraisals
- Exit interviews and termination
- A five-step add employee wizard
- Export reports to PDF
- Multi-site facility layering

WaypointHR also offers an active online support forum, a dedicated support website (which includes developer support), as well as an on-demand solution (for those that do not want to bother their selves with the installation of WaypointHR on a local machine).

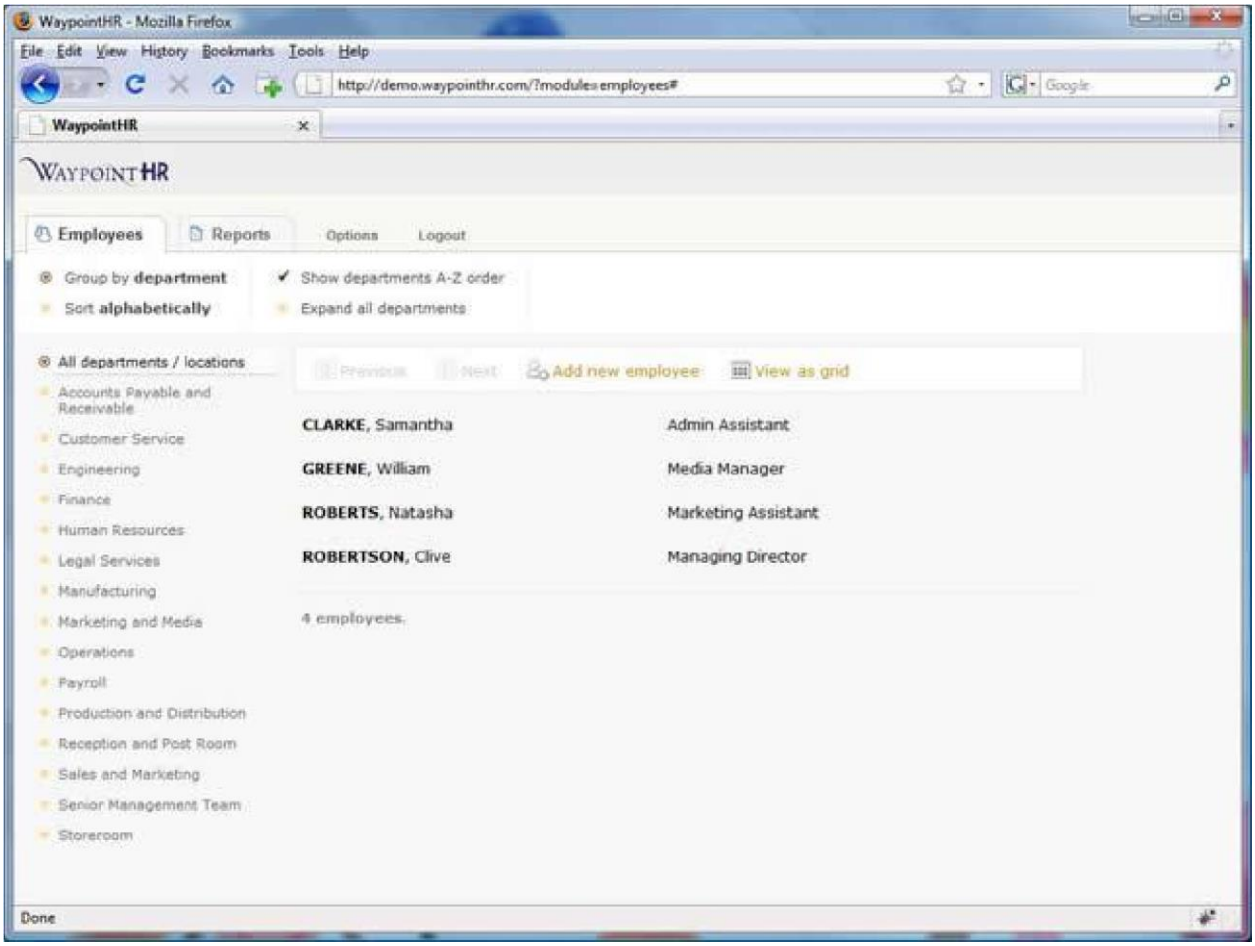

Figure 2.7 Snapshot of WaypointHR interface

Sage HR Africa

Sage HR Africa offers world-class HR and payroll software and services to the African continent. They have an African footprint of 35 countries that includes an extensive network of Strategic and Business Partners that can assist with installation, training and any on-site support. They are committed to providing robust, innovative and easy to-use human resource and software applications that will make business life so much easier. They ensure statutory compliance with local authorities and with their software, businesses are always in line with country-specific payroll

and HR rules and regulations. Their HR and Payroll software is ideal for any size and type of business. Whether startups or an existing business that is growing, Sage HR Africa's software solutions aim to support the growth of businesses and to develop an ongoing partnership with their potential customers for the long-term.

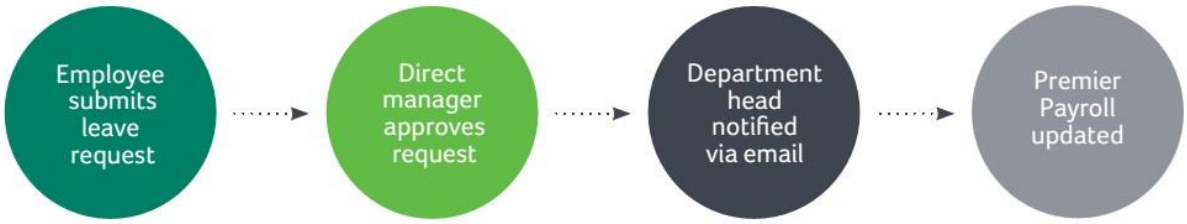

Figure 2.8 Sage HR Africa Leave application workflow

2.6 Summary

The literature review in this chapter has looked at a brief overview of existing HR and employee management systems and what procedures have to be followed when executing these HR tasks. Various front and back end technologies were also reviewed, highlighting the advantages and disadvantages of their use. The next chapter will take a look at the system analysis of the developed system.

3.0 CHAPTER THREE: SYSTEM ANALYSIS

3.1 Introduction

This chapter gives a detailed outline of the software development methodology used in this project, following up with the various existing software development methodology discussed in chapter two. The strength and weaknesses of the chosen methodology have been outlined. Furthermore, the functional and non-functional requirements of the system are explained in detail and the use cases, which are a list of steps, typically defining interactions between a role and a system to achieve a goal. Class diagrams have also been presented to show detailed data modeling of the system which will be translated into code.

3.2 Software Development Methodology of Choice

Having briefly discussed a few software development methodologies in chapter two, the incremental method was favored for the following reasons:

- It allows for development of high-risk or major functions first
- Each release delivers an operational product
- Customer can respond to each build
- Uses "divide and conquer" breakdown of tasks
- Lowers initial delivery cost
- Initial product delivery is faster
- Customers get important functionality early
- Risk of changing requirements is reduced

3.3 System Design

3.3.1 Use case analysis

A use case defines a goal-oriented set of interactions between external users and the system under consideration or development. Thus a Use Case Scenario is a description that illustrates, step by step, how a user is intending to use a system, essentially capturing the system behavior from the user's point of view.

In order to create relevant use cases for the system, the following actors for the system have been identified:

- Employee (Staff of FRI)
- Head of Division (HOD)
- Human Resource (HR)
- Admin

Actors, Use Cases and their Description

Actor	**Use case**	**Description**
Employee	Edit Profile	Employee will be able to edit personal details such as emergency contacts as well as technical skills acquired.
Employee	Apply Leave	Employee will be able to submit leave request along with supporting documents.
Employee	View Tasks	The employee will be able to view tasks assigned by the HOD.
Employee	Check Leave days	Employee will be able to check leave days.
HOD	Assign tasks	HOD will assign tasks to employees in his division.
Admin	Add new employee	Admin will be able to create new employees.
Admin	Edit user role	Admin will be able to edit user roles.
HR	Accept leave application	HR will accept leave
		Applications from employees.

HR	Reject leave application	HR will reject leave applications from employees.
Admin	View user activity log	Admin will be able to view activity log of all users in the system
HOD	Create projects	The HOD is able to create a project, come up with a project teams as well as assign tasks to the project members breaking it down into a WBS.
HOD	Create trainings	HOD will create trainings and delegate employees that will attend the trainings.
HR	Generate reports	HR will be able to generate reports containing employee information.

Table 3.1 Actors, Use Cases and their Description

Use case diagrams:

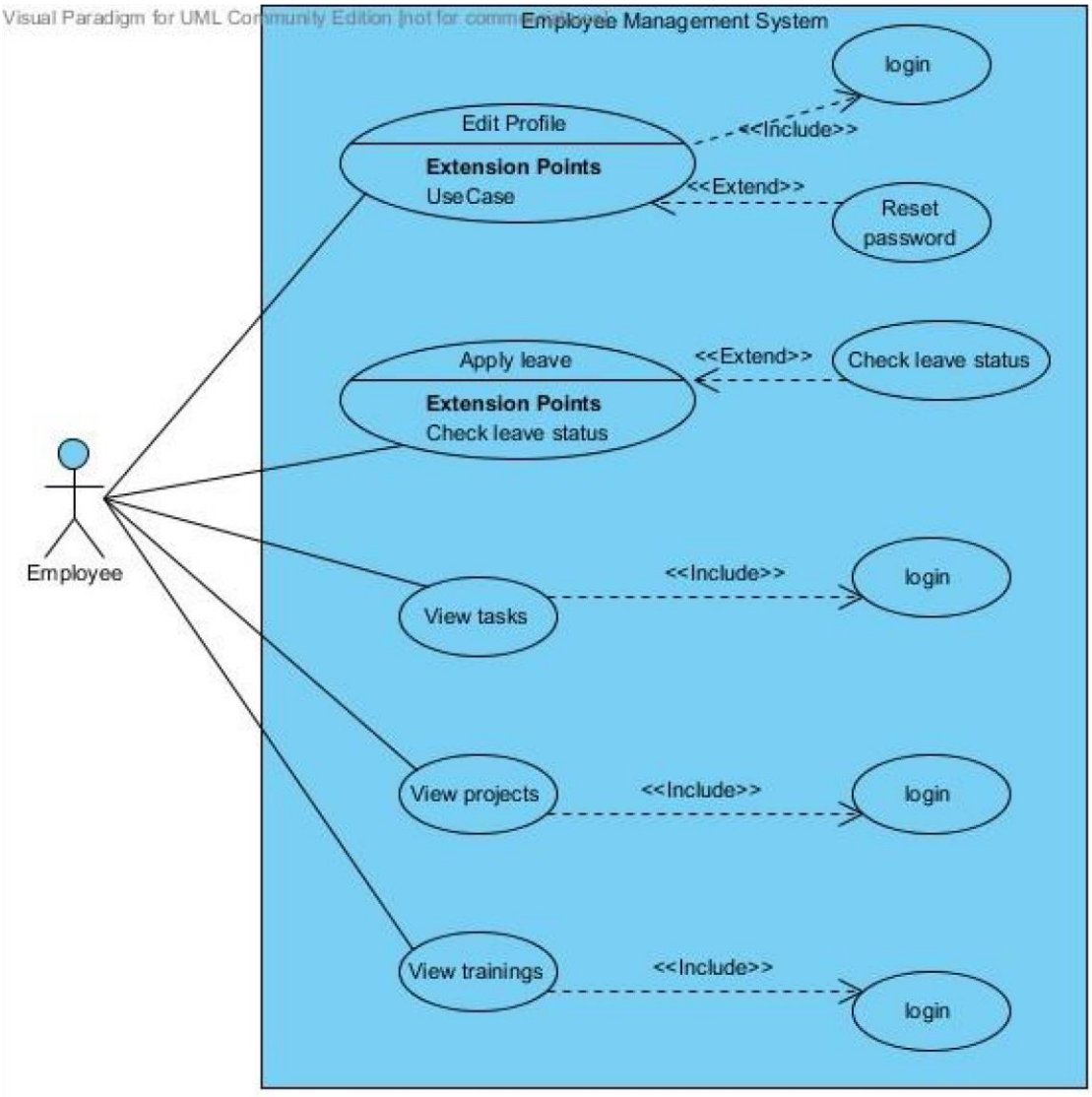

Figure 3.1 Employee use case

Figure 3.2 HOD use case

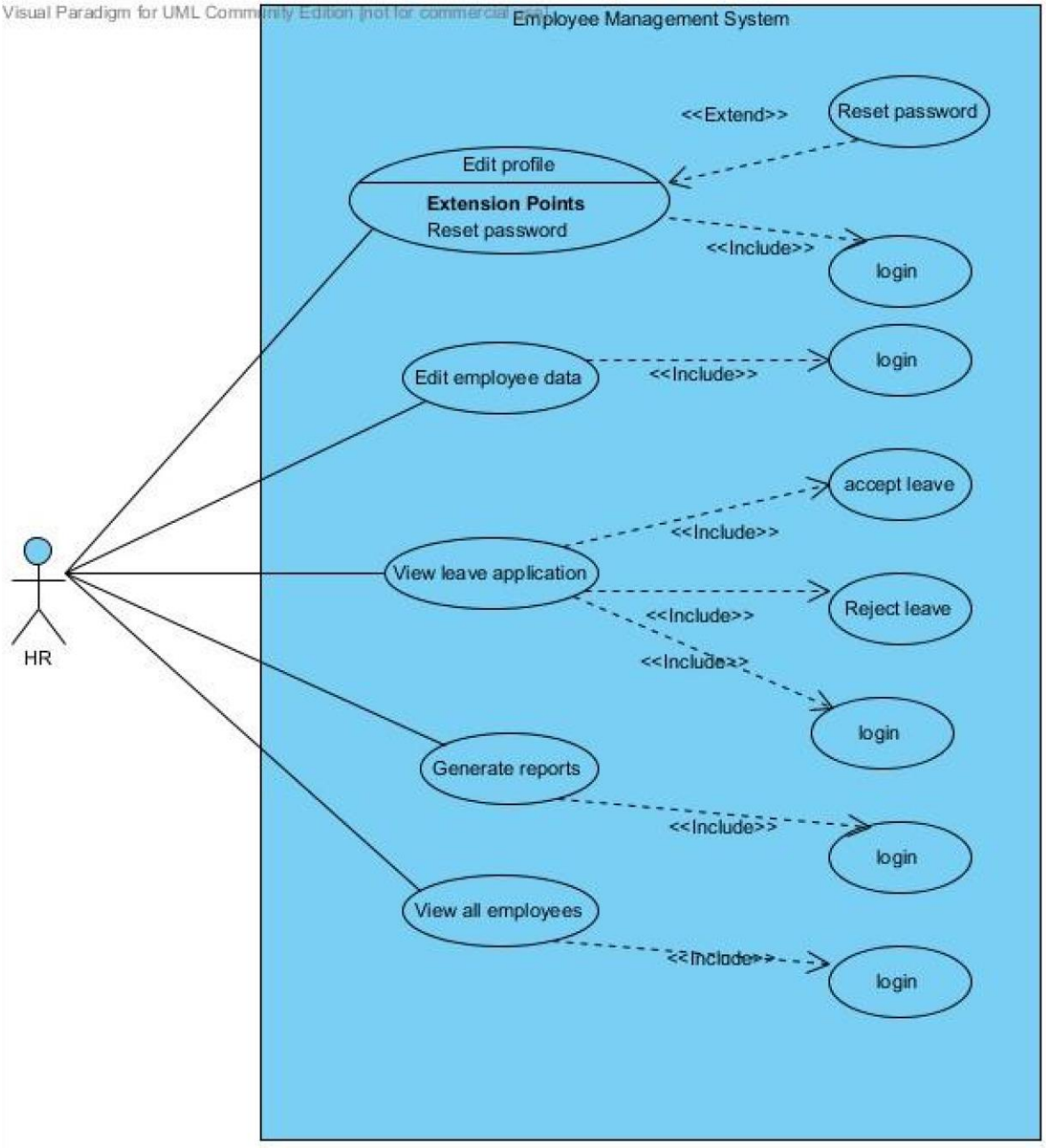

Figure 3.3 Human Resource use case

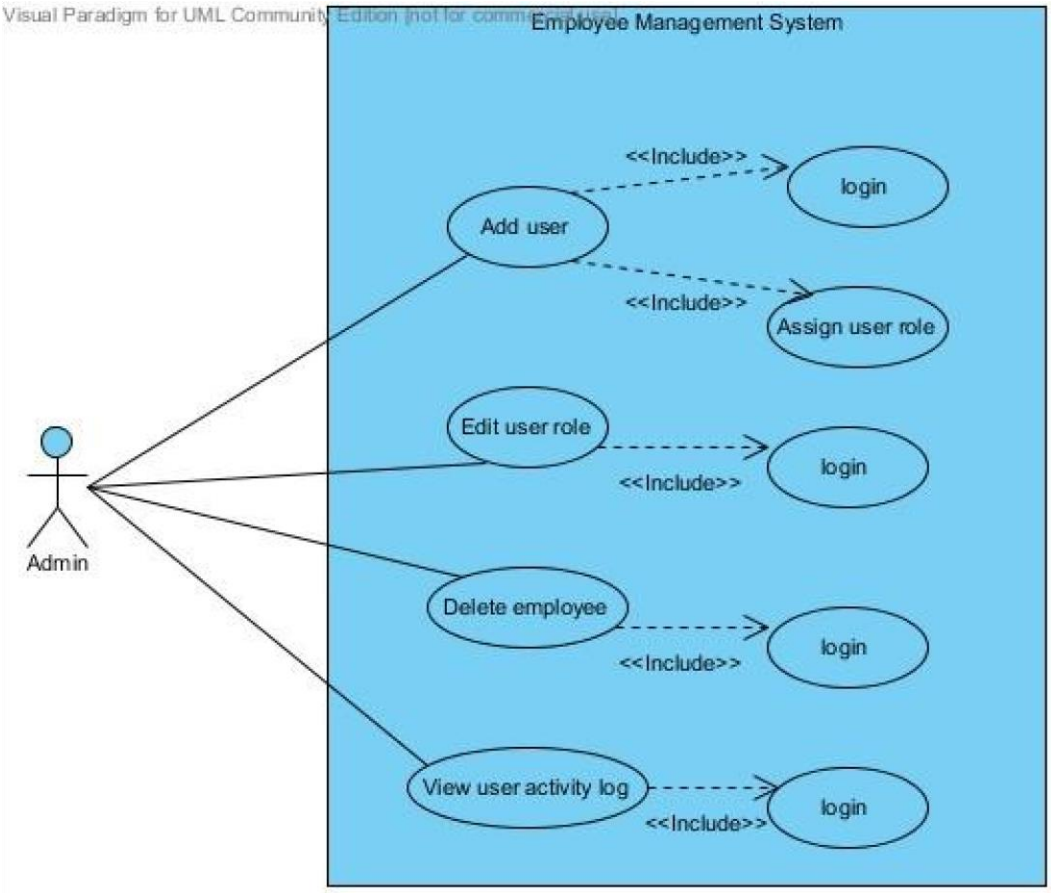

Figure 3.4 Admin use case

3.3.2 Class diagram

In the class diagram below, the Employee and Admin classes inherit from the User class. The employee class is also parent class to Human Resource class, Head of Department/Division class and Ordinary employee class. An ordinary employee include staff members who do not interact with the system with many privileges. These employees carry out the same operations.

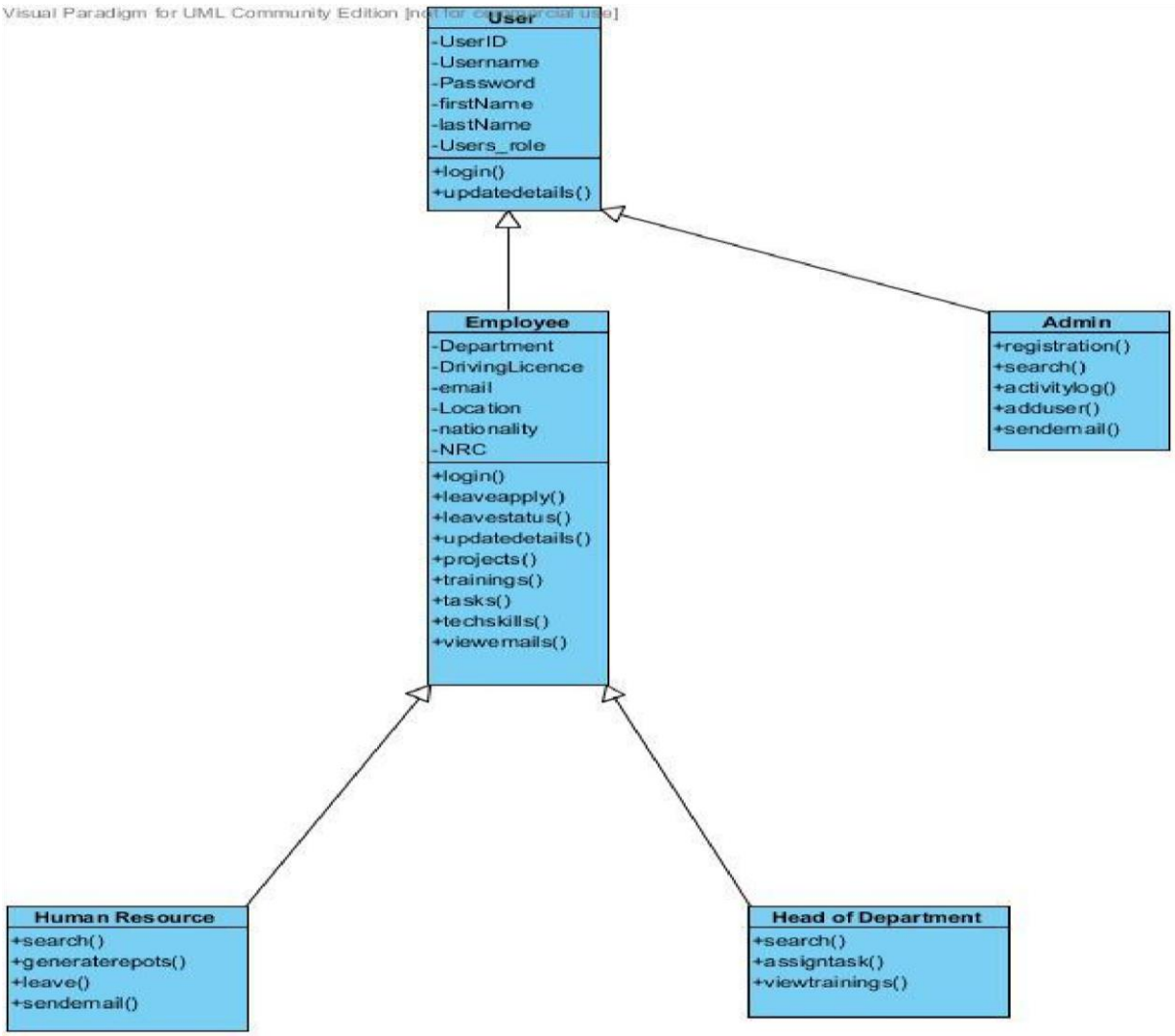

Figure 3.5 Human Resource Information System Class diagram

3.4 Development Tools

This part of the chapter gives an account of technologies used in the development of the system.

3.4.1 Front End Technologies

Front end is a term used to characterize program interfaces and services relative to the initial user of these interface and services. It is usually refers to the client side of an application. A front end application is one that users interact with directly. According to Turban et al, front end is defined as the portion of an e-seller's portal, electronic catalogs, a shopping cart, a search engine and a payment gateway (Turban et al, 2008).

HTML

HyperText Markup Language (HTML) is a computer language devised to allow website creation. These websites can then be viewed by anyone else connected to the Internet. It is relatively easy to learn, with the basics being accessible to most people in one sitting; and quite powerful in what it allows you to create.

Having the basic knowledge of HTML could help make or develop m-commerce websites and will also prove to be handy especially for editing and modifying web pages. Furthermore, it has some low cost benefits because of its many free online tutorials and advice support which is vital for m-commerce development.

JavaScript

JavaScript is a scripting language that is browser based and was developed by Netscape to enable web masters/authors to add interactivity and enhances behavior of web pages. Some of the dynamic behavior that can be generated by JavaScript is validating form, performing specific actions e.g. after a mouse click, adding timestamps etc. JavaScript is an open language and anyone can use it. It also shares many of the features and structures of the Java programming language, though it is not really related to Java. It was developed independently.

CSS

CSS (Cascading Style Sheet) is a style sheet language used to describe presentation and layout of HTML tags. CSS is used to enable separation of document content from document presentation. This refers to the separation of document presentation aspects such as colors, layouts and fonts from the actual document content. CSS helps us achieve layout design and control much easier.

JSON

JSON (JavaScript Object Notation) is a lightweight data-interchange format. It is easy for humans to read and write. It is easy for machines to parse and generate. It is based on a subset of the JavaScript Programming Language. JSON is a text format that is completely language independent but uses conventions that are familiar to programmers of the C-family of languages, including C, C++, C#, Java, JavaScript, Perl, Python, and many others. These properties make JSON an ideal data-interchange language.

JSON is built on two structures:

- A collection of name/value pairs. In various languages, this is realized as an *object*, record, struct, dictionary, hash table, keyed list, or associative array.
- An ordered list of values. In most languages, this is realized as an *array*, vector, list, or sequence.

These are universal data structures. Virtually all modern programming languages support them in one form or another. It makes sense that a data format that is interchangeable with programming languages also be based on these structures.

jQuery

jQuery is a fast, small, and feature-rich JavaScript library. It makes things like HTML document traversal and manipulation, event handling, animation, and Ajax much simpler with an easy-to-use API that works across a multitude of browsers. With a combination of versatility and extensibility, jQuery has changed the way that millions of people write JavaScript.

3.4.2 Back-End Technologies

PHP

PHP, abbreviated to Hypertext Preprocessor is a server side web programming language that can be embedded into HTML. PHP is free software i.e. it is open source code. It is used for creating dynamic web pages that interact with the user and can include functionalities such as getting user input, manipulation of the input and storage of this data in a suitable DBMS. PHP is also easy to integrate with web pages (Manuel and Palacio, 2010).

MySQL

MySQL stands for My Structured Query Language. It is the world's most popular open source relational DBMS. MySQL is available for free under the GNU General Public License for open source benefits/reasons related to development. Initially MySQL was free and some versions of it are still free though if you desire to use MySQL for commercial purposes you will need to purchase a license. It is non-proprietary, easily extensible and platform independent. Its downside is that it lacks a graphical user interface; therefore you need to know how the database works to make the most efficient use of it (Deitel and Deitel, 2008).

The Apache HTTP server

The Apache HTTP server is a software (or program) that runs in the background under an appropriate operating system, which supports multi-tasking, and provides services to other applications that connect to it, such as client web browsers. It was first developed to work with Linux/Unix operating systems, but was later adapted to work under other systems, including Windows and Mac. The Apache binary running under UNIX is called *HTTPd* (short for HTTP daemon), and under win32 is called *Apache.exe*.

Apache is the most popular web server (after which comes Microsoft's IIS) available. The reasons behind its popularity, to name a few, are:

- It is free to download and install.
- It is open source: the source code is visible to anyone and everyone, which basically enables anyone (who can rise up to the challenge) to adjust the code, optimize it, and fix errors and security holes. People can add new features and write new modules.

- It suits all needs: Apache can be used for small websites of one or two pages, or huge websites of hundreds and thousands of pages, serving millions of regular visitors each month. It can serve both static and dynamic content.

3.5 Summary

The core emphasis of this chapter was the analysis of the current system. The various development tools used in the project were also discussed. The next chapter will focus on the design characteristics and aspects of the system to be developed.

4.0 CHAPTER FOUR: SYSTEM DESIGN

4.1 Introduction

This chapter builds on the work done in the Analysis Chapter and gives documentation for the Design of the Human Resource Information System. The HRIS is modeled in terms of objects and classes and their interactions with each other. Explanation of the proposed system is done as well as the structure of the Entity Relationship Diagram (ERD). Design of the User Interface is also discussed.

4.2 Explanation of the Proposed System

The proposed system is designed to eliminate all the drawbacks of the existing paper base human resource management. The system shall be responsible for maintaining information about employees, thus their personal profile. The system shall incorporate leave management all the way from application to acceptance/rejection of leave requests as well as all employees' projects with close monitoring of the projects from creation to completion and trainings to assist in monitoring active and inactive employees.

The main features to be added include:

- Employee profiles
- Leave management
- Trainings
- Workshops and Conferences management
- Local and International Travels management
- Task management
- Projects (Work Breakdown Structure)
- Notifications
- Employee Self-Service (ESS)
- Resume Tracking/Prospective Employee management
- Report generation

4.3 System and Algorithm Flowcharts

Activity Diagrams are used to model different aspects of a system. The following activity diagram is used to model the leave application function.

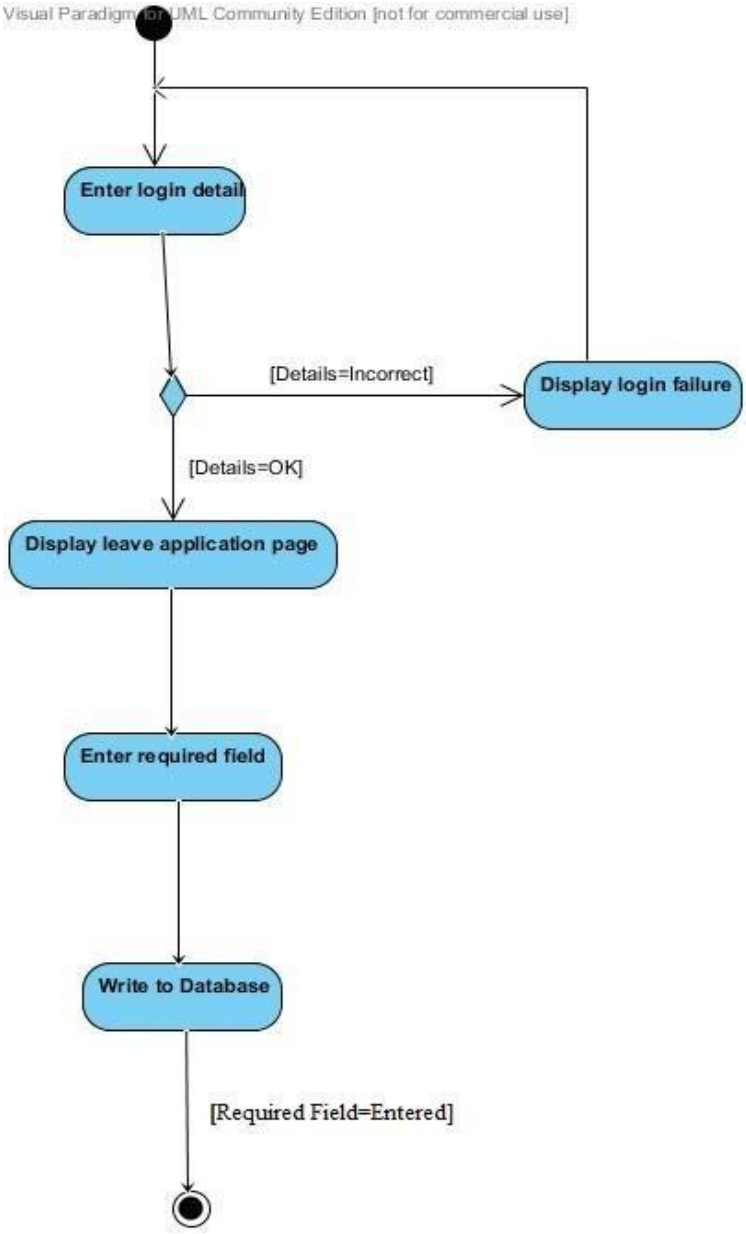

Figure 4.1 Activity diagram for leave application

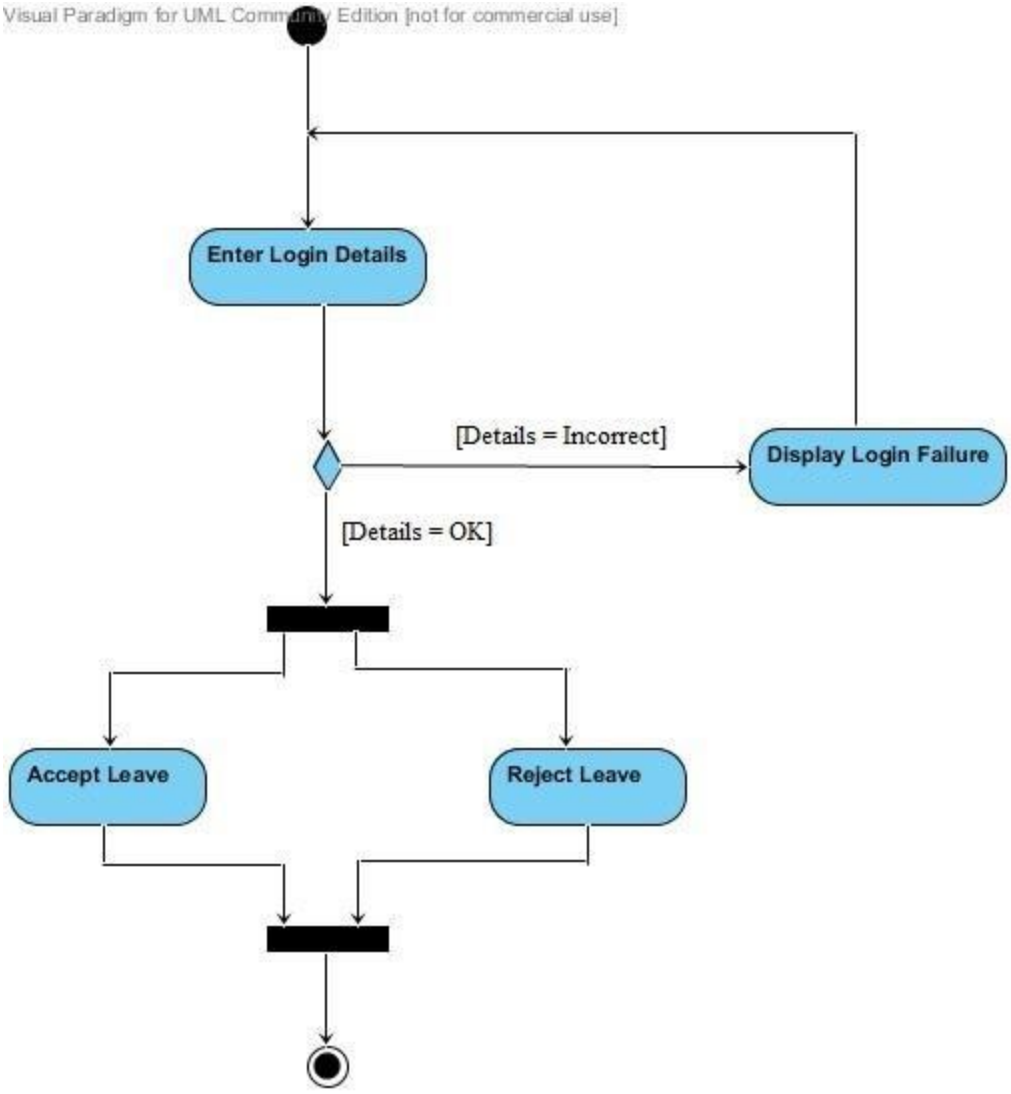

Figure 4.2 Leave Acceptance/Rejection

4.4 System Structure Chart DFD and ERD

4.4.1 Data Flow Diagram (DFD)

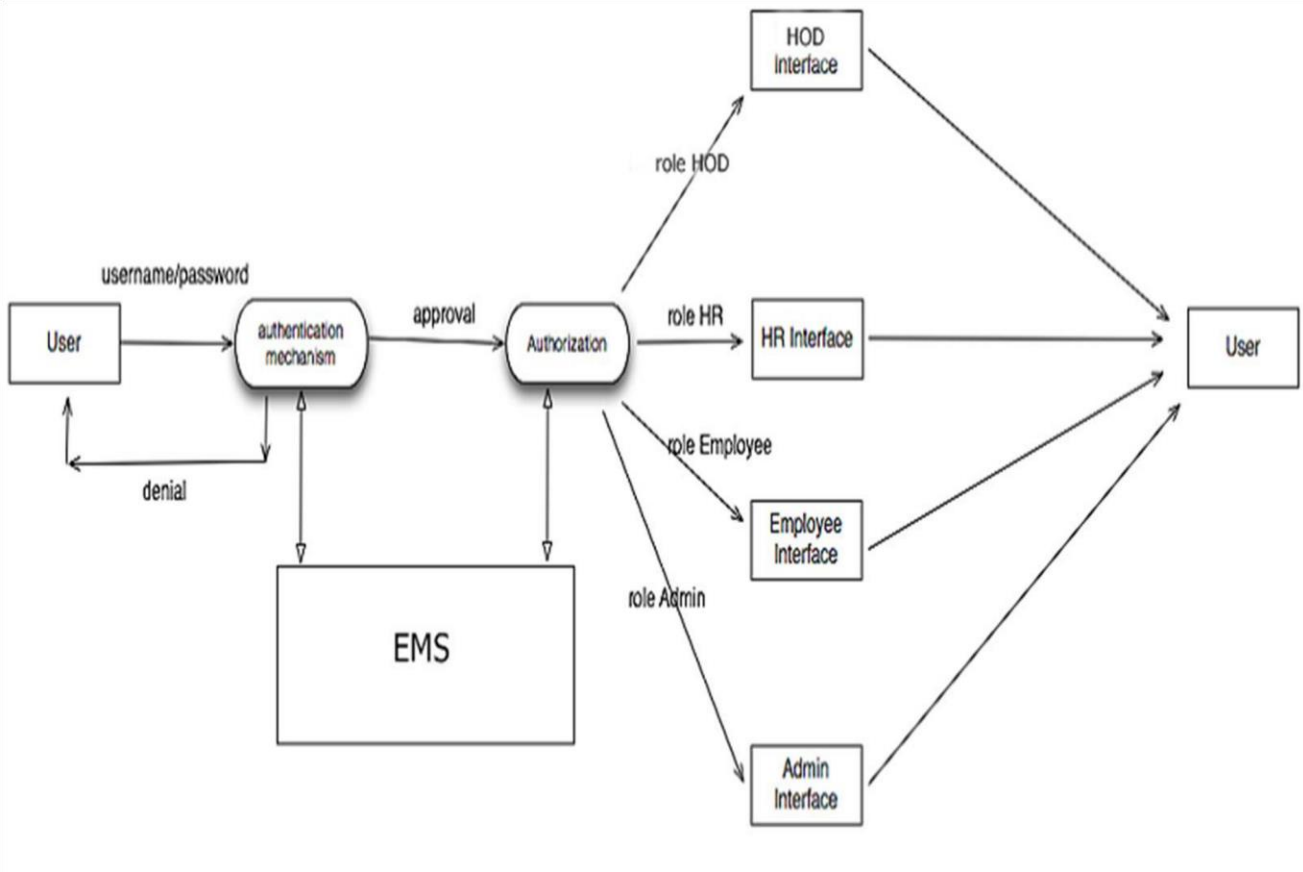

Figure 4.3 Authorization & Authentication DFD

4.4.2 Entity Relationship Diagram (ERD)

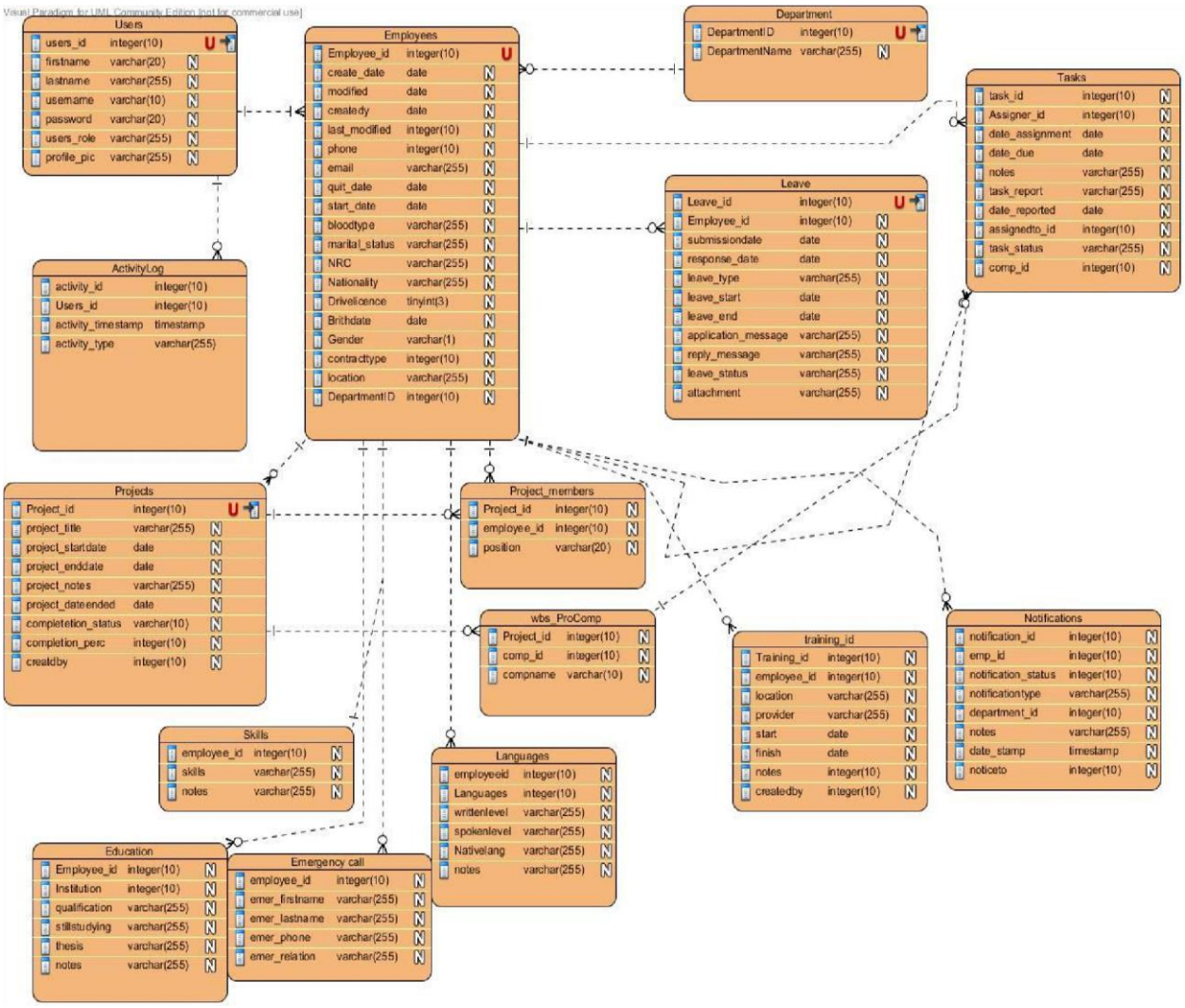

Figure 4.4 Entity Relationship Diagram

4.5 Storyboard

4.5.1 Sequence Diagrams

Sequence diagrams help in the identification of a detailed level of the operations required to implement the functionality depicted by a use case model.

Scenario 1: Admin add new employee (user)

1. The user logs in by providing correct username and password.
2. If username and password are not found in the database, access into the system is denied.
3. If the credentials are identical to the ones found in the database, access is granted.
4. User enters the details of the new employee.
5. The user input is written to the database.

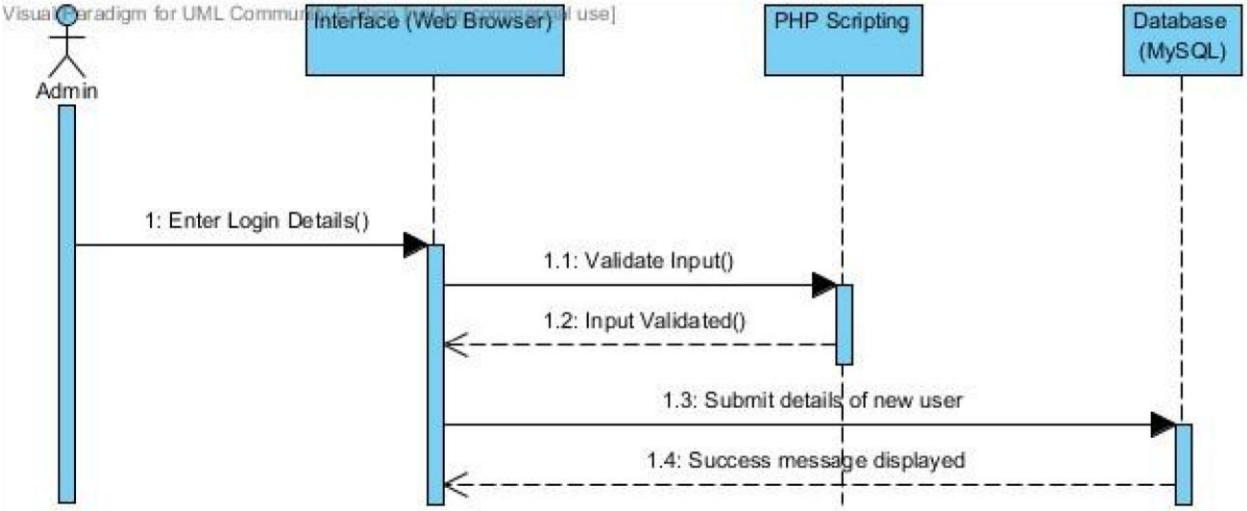

Figure 4.5 Add new user sequence diagram

Scenario 2: HOD Create Projects

1. The user logs in by providing correct username and password.
2. If username and password are not found in the database, access into the system is denied
3. If the credentials are identical to the ones found in the database, access is granted.
4. The user creates a project and assigns members.
5. The user input is written to the database.

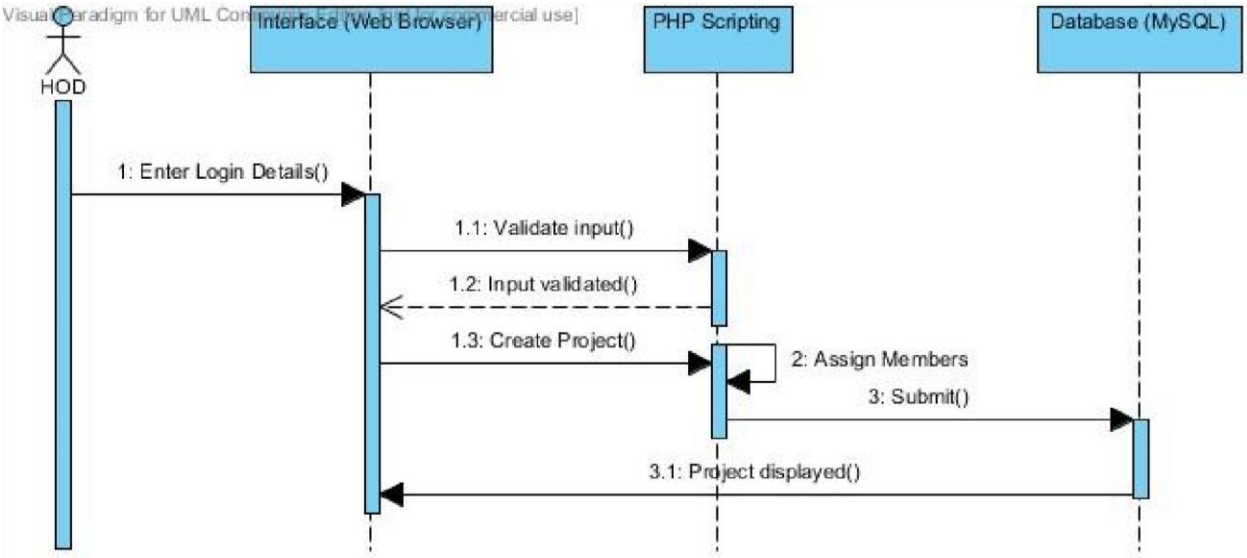

Figure 4.6 Create Projects Sequence Diagram

Scenario 3: Employee leaves application

1. The user logs in by providing correct username and password.
2. If the username and password are not found in the database, access into the system is denied.
3. If the credentials are identical to the ones found in the database, access is granted.
4. User requests for leave form.
5. User enters leave details.
6. Details are written to the database.
7. A message confirming details have been submitted is displayed to the user.

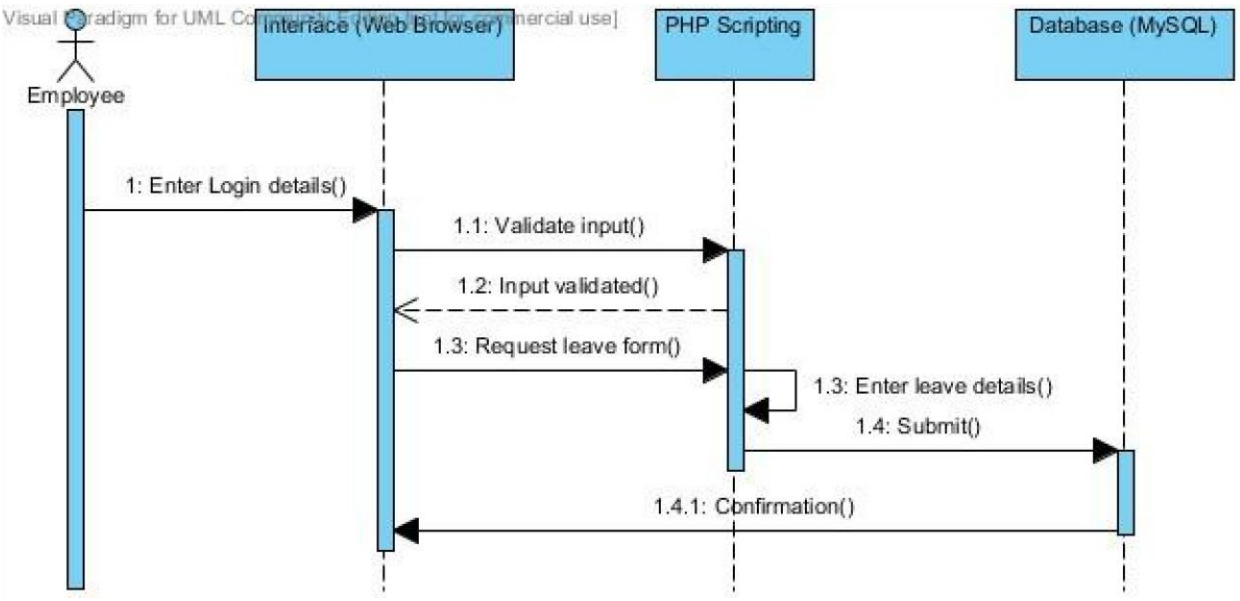

Figure 4.7 Employee Leave Application Sequence Diagram

4.6 Interface Design

The web application was created with the following design considerations in mind:

- **Consistency**. The website should have a similar look and feel on every page. Every page should have the same header/logo, heading style, fonts, navigations etc.
- **Efficient and easy to maintain**. This refers to the fact that there is the need to separate content from layout, so that you can easily change your page design without editing every page on the site.
- **Layout**. The layout of each page should have a good contrast between the text and background area. This helps considerably with visibility as it will be difficult to read the text if it is almost the same color as the background. Monitor size should also be taken into consideration.
- **Easy to navigate and use**. Users should not have a hard time trying to navigate the site. Navigation links should be consistent and clearly labeled. All navigation links should also be working properly and should point to the intended page/site.

- **Browser compatibility**. When designing the site, consider different browser environments. Extensive testing should be done on each page in all the major browsers and the design changed appropriately to cater for all.
- **Visually appealing**. The use of color, text, fonts and graphics should be carefully considered and used to ensure that the site is visually appealing to its visitors.
- **Speed**. The performance of a website is mostly rated by its uptime and downtime. These terms refers to the amount of time it takes the site to respond to requests. Graphics should be kept to a minimum to allow the site to load faster. The pages on the site should load within an acceptable time e.g. under 10 seconds.

4.7 Sketches of graphics

Below is the interface design for the HRIS application:

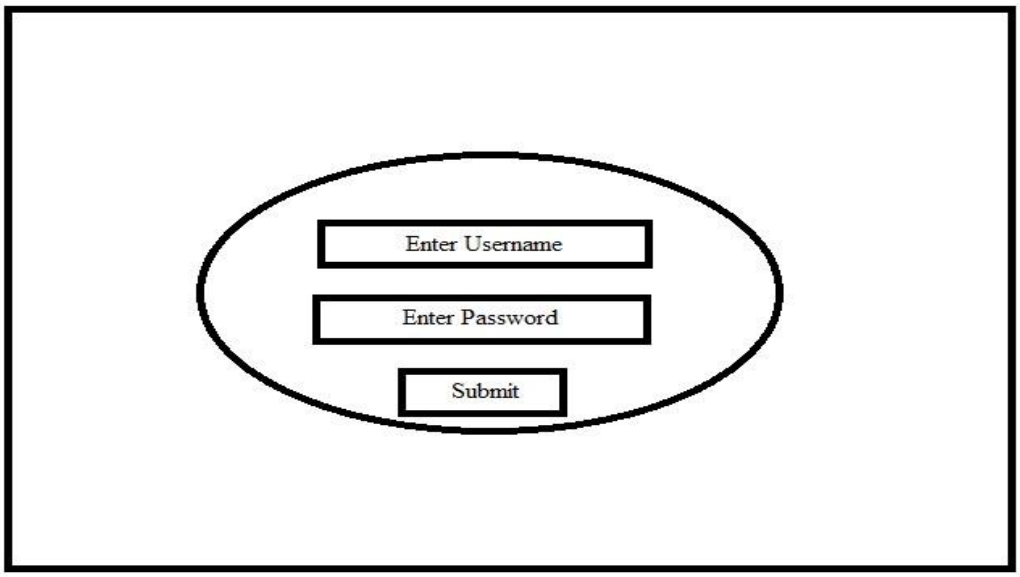

Figure 4.7.1 Login Interface

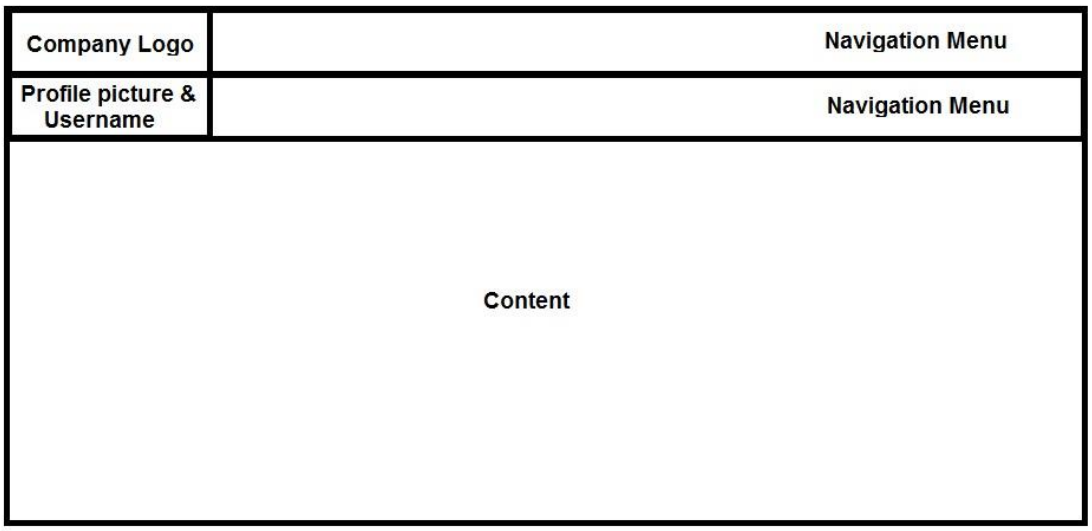

Figure 4.7.2 Employee Interface after Login

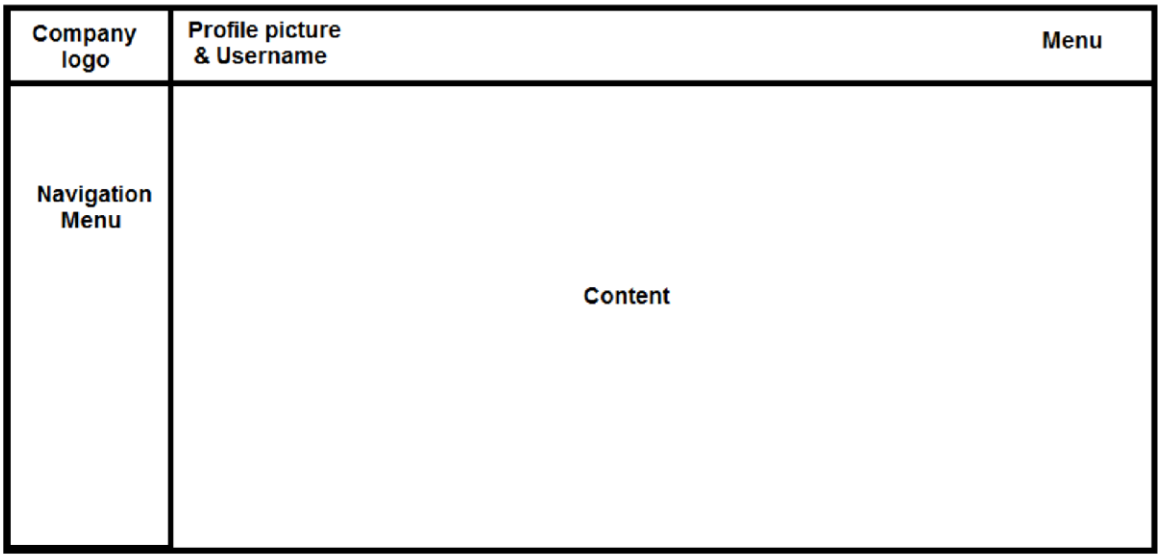

Figure 4.7.3 Admin/HR/HOD Interface after Login

4.8 Summary

This Chapter has specified the design of the HRIS. The aspects of the design that have been discussed are system design, interface design, and database design by providing the DFD and ERD. The next chapter looks at the implementation of the HRIS. This depends on the design specification given in this chapter.

5.0 CHAPTER FIVE: IMPLEMENTATION

5.1 Introduction

This chapter will explore the different aspects concerned with the implementation of the developed system. This project was concerned with the development and implementation of the human resource information system. We began with analysis of the current and proposed systems, the design of the system to be developed, and in this chapter we shall deal with implementation of the developed system.

5.2 Description of Developed System

The developed system encompasses various activities associated with managing employee information. The main functionalities available in this system are:

- Maintaining employee profiles
- Leave management
- Local and international travels management
- Workshops and conferences management
- Employee Trainings
- Prospective employee management/Resume tracking
- National service personnel and Students vacation attachment management
- Employee self-service (ESS)
- Task management
- Project Management

All these features include the ability to add user, update (edit), and retrieve through search results. It also contains a report generation system that can be saved in a pdf, word or excel file format.

5.2.1 Accessing the system

The developed System has four main access levels which are:

- Employee
- Head of Division (HOD)

- Human Resource Manager (HR)
- Administrator

All users are presented with the same login interface. User must log into the system by means of valid username/password combination. After access is granted to the system, the admin can add a new user to the system by entering the basic information which are the full names and email address. The admin also assigns the new user a role which will determine the access level. During the process of user registration, all users are issued with a unique username and password combination. Because the system holds private employee information, the admin has the ability to monitor all activity logs in the system by date and time. The newly added user logs into the system with a default password which can later be changed to a more secure password. All employees can edit basic information such as newly acquired technical skills and emergency contacts. Employees can apply for leave by filling in a form as well as submitting an attachment to support their leave request.

The HOD has the ability to view all employees under his/her division, assign a task and trainings. The HOD can also create a project, add members to the project and create a work breakdown structure. Being an employee, the HOD can apply for leave as well as check leave days accrued.

Upon logging into the system, the HR manager gets notifications on the leave applications submitted and has the ability to approve or reject leave requests as they are submitted. The HR carries out all employee tasks which include the ability to view and edit basic details, view pending tasks, projects and trainings. The HR also has the ability to generate employee reports in PDF, EXCEL or WORD format.

5.3 Technical Details of Implemented System

5.3.1 Model View Controller architecture (MVC)

In the implementation, as shown in figure 5.1, the whole application is broken down into a series of top-level components which may be referred to as tasks, actions, functions, operations or transactions (that's *user* transactions, not *database* transactions), each of which may be related to a Use Case. Each transaction component references a single controller, one or more models, and usually a single view. Some components do not have a view as they are called from other

components in order to perform a service, and once this service has been completed they return control to the calling component. Each component is self-executing in that it deals with both the HTTP GET and POST requests (Connolly, T., and Begg, C., 2005).

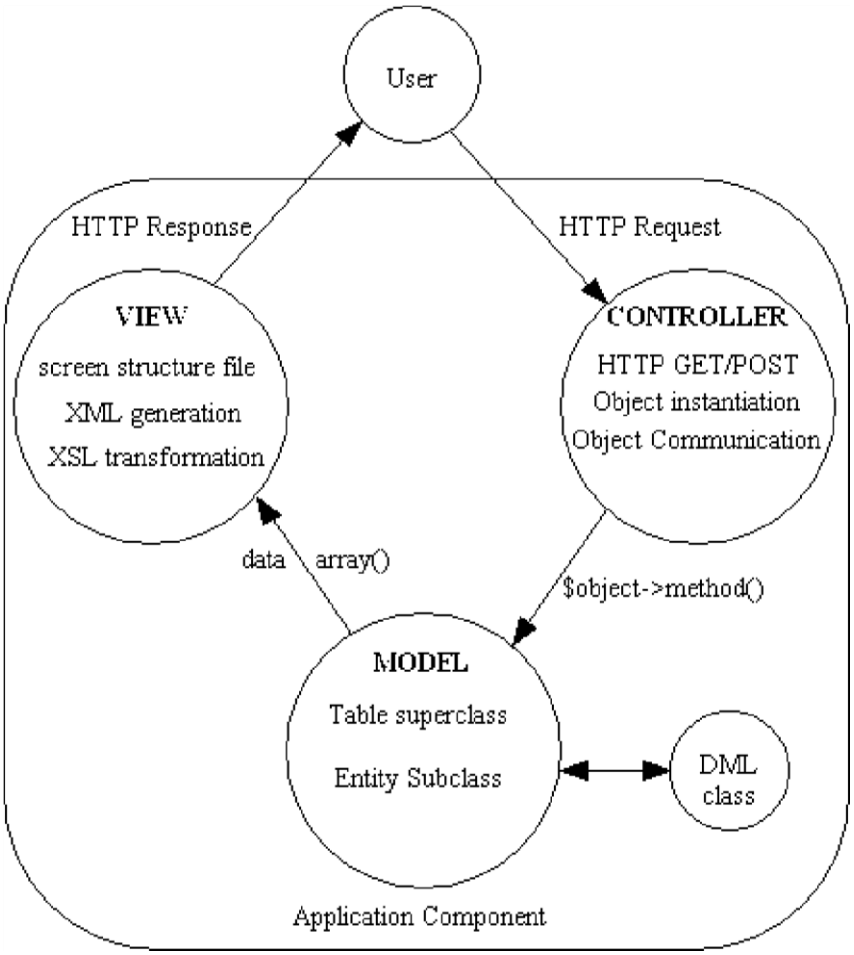

Figure 5.1 Model View Controller Architecture

5.3.2 MySQL Triggers

5.3.2.1 Implementation of MySQL Triggers

In MySQL, a trigger is a set of SQL statements that is invoked automatically when a change is made to the data on the associated table. A trigger can be defined to be invoked either before or after the data is changed by INSERT, UPDATE or DELETE statements. MySQL allows you to define maximum six triggers for each table.

- BEFORE INSERT – activated before data is inserted into the table.
- AFTER INSERT- activated after data is inserted into the table.
- BEFORE UPDATE – activated before data in the table is updated.
- AFTER UPDATE - activated after data in the table is updated.
- BEFORE DELETE – activated before data is removed from the table.
- AFTER DELETE – activated after data is removed from the table.

When you use a statement that makes change to the table but does not use INSERT, DELETE or UPDATE statement, the trigger is not invoked. For example, the TRUNCATE statement removes the whole data of a table but does not invoke the trigger associated with that table.

There are some statements that use the INSERT statement behind the scenes such as REPLACE statement and LOAD DATA statement. If you use these statements, the corresponding triggers associated with the tables if available will be invoked (Avison and Fitzgerald, 2003).

5.3.3 System Development and Deployment

The system was developed and tested on a laptop computer running Ubuntu Desktop 14.04 and the LAMP Server (Linux, Apache, MySQL and PHP). In order for the Web application to be accessible via the Internet, the application was deployed onto the FRI virtual server running Ubuntu Server 14.04 LTS, Apache web server and PHP. Users can access the system using a suitable web browser (Google Chrome, Mozilla Firefox, Internet Explorer 9+, Apple Safari, Opera etc) with the registered domain name of http://intranet.foodresearchgh.org/mis.

5.3.4 Algorithms

MD5 Encryption

MD5 algorithm was used for password encryption. MD5 stands for **Message Digest** algorithm **5** and is a widely used cryptographic hash function. The idea behind this algorithm is to take up a random data (text or binary) as an input and generate a fixed size "hash value" as the output. The input data can be of any size or length, but the output "hash value" size is always fixed. Here is an example (Figure 5.2) of MD5 Hash function at work:

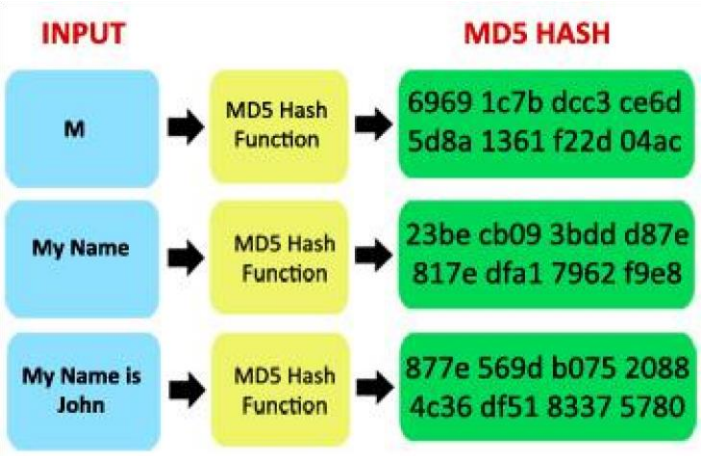

Figure 5.2 MD5 Encryption procedure

As can be seen from the above example, whatever input size is given, the algorithm generates a fixed size (32 digit hex) MD5 hash.

5.3.5 Pseudo code

Login into the system

Startup system

Enter username and password

On clicking the login button

Connect to database

Query database to know whether user credentials are correct
If not

Deny access and return login page with an error message

If correct

Check if credentials are for administrator

If yes

Allow login

Set admin session

Redirect administrator to admin home page

If no

Allow login

Set user session

Redirect user to user home page

Add new user

Check if administrator is logged in

If correct

Check if all fields entered are correct

If not

System message: please enter all fields

If correct

Registration of new user successful

Apply for leave

Check if employee is logged in

If correct

Check if all fields are entered

If not

System message: please enter fields

Check if file has being attached

If not

System message: please attach file

If correct

Leave request has being made

5.4 Screenshots of Developed System

Refer to appendix C for screenshots of developed system.

5.5 Summary

This chapter has outlined how the human resource information system (HRIS) has been implemented using the Model View Controller (MVC) architecture. The method selected for the systems development and implementation has been highlighted and justified, lastly the chapter concludes by showing how the system has been deployed and the encryption technology used. The next chapter is on Testing, it focuses on the tests carried out to ensure the system functions according to its specifications.

6.0 CHAPTER SIX: TESTING AND VERIFICATION

6.1 Introduction

Testing is very important and critical to the success of any project that aims at delivering working software. There are many types of testing that a system may be subjected to, however only the ones in the testing objectives will be carried out for this system.

6.2 Scope

The overall purpose of testing is to ensure that the Human Resource Information System meets all of its functional and business requirements. The purpose of this chapter is to describe the overall test plan and strategy for testing the system.

6.3 Testing Goals

The goals in testing this system include validating the quality, usability, reliability and performance of the application. Testing will be performed from a black-box approach. Tests will be designed around requirements and functionality.

6.4 Confirmation Testing

Confirmation testing or re-testing: When a test fails because of a defect, then that defect is reported and a new version of the software is expected that has had the defect fixed. In this case we need to execute the test again to confirm whether the defect got actually fixed or not. This is known as confirmation testing and also known as re-testing. It is important to ensure that the test is executed in exactly the same way it was the first time using the same inputs, data and environments.
Hence, when the change is made to the defect in order to fix it then confirmation testing or retesting is helpful.

6.5 Regression Testing

During confirmation testing the defect got fixed and that part of the application started working as intended. But there might be a possibility that the fix may have introduced or uncovered a different defect elsewhere in the software. The way to detect these 'unexpected side-effects' of fixes is to

do regression testing. The purpose of a regression testing is to verify that modifications in the software or the environment have not caused any unintended adverse side effects and that the system still meets its requirements. Regression testing are mostly automated because in order to fix the defect the same test is carried out again and again and it will be very tedious to do it manually. Regression tests are executed whenever the software changes, either as a result of fixes or new or changed functionality.

6.6 Test Plans and Results

The Test Plan is derived from the Requirements, Functional Specifications, and detailed Design Specifications. The Test Plan identifies the details of the tests, identifying the associated test case areas within the product.

Test Case	**Test Purpose**	**Test Condition**	**Expected Outcome**	**Actual Result**
Login	Check username and Password	If user details are not correct, display error message	Grant Access to the applicable main system	User successfully logs into the system upon submission of correct login credentials.
Add new user	To ensure that a new user is added to the system successfully.	If user already exists in the system, error message should display.	New user should be successfully added to the system.	If email address entered already exists in the system, error message is displayed. If the email address of the new employee does not exist in the system, new employee is successfully added.

Edit personal details	To ensure that once different details are provided on the edit personal details form and submitted, these details are altered in the database to reflect the recent changes	On the edit personal details form provide different information from what is currently being displayed	When the form is altered the details should be altered in the database and a confirmation message of the change should be displayed.	Once the data in the form is altered and the submit button clicked the details in the database are altered and a confirmation message of the change is displayed.
Apply leave	To test if all employees can successfully apply for leave.	Whenever an employee applies for leave, information as well as attachments should be submitted to the HR manager.	Leave request should be sent when all required fields are submitted and necessary documents have being attached to the request.	Leave request is submitted as required and a message of success is displayed.
Create project	Test if a Head of Division can create a project and later assign a project team.	Whenever a project is created, HOD should be able to assign project team and view members.	A project should be created as well as coming up with a project team and WBS.	Project is created and HOD can view the project team.

View notifications	Test if employee is notified when leave has being accepted or rejected and when new tasks, trainings or projects have being assigned.	If employee has being added to a project, he/she should get a notification.	Notifications should be displayed on the employee interface whenever a task has being assigned; employee has being added to a project team project, or trainings. As well as when a leave request has being accepted or rejected.	Notifications appear on the employee interface.
Upload picture	Test if users can upload a profile picture associated to their account	Employee should be able to upload a profile picture if they so wish.	Employee is able to upload profile picture.	Message of success is displayed when employee uploads picture and they are asked to log out and back in for changes to take place.
Generate reports	Test if HR can generate employee reports.	To ensure that the selected report is displayed	Once a choice of report is made by clicking the link of choice the report should be displayed.	When the choice of report is made and link clicked a report is displayed.

Table 6.1 Shows system test plan and results

6.7 Summary

The chapter discussed how the proposed system was subjected to various types of testing. This brought to light why it is very cardinal to test a new system before it is introduced into the main stream of an organization's business.

7.0 CHAPTER SEVEN: CONCLUSION

7.1 Introduction

The aim of this chapter is to draw conclusions of the work done or achieved and to give an assessment of the completed system, discuss the Problems faced, limitations of the system and give future recommendations on how the system can be improved.

7.2 Results

The software product produced was very good, it achieved most of the user requirements, the user interface is good and is very easy to navigate, and even novice users can find their way around the web application easily. The client side validation is excellent. The system is able to generate user defined reports or structured reports (reports based on specific information the Human Resource is interested in) well. The lack of integration with a payroll system is the major drawback of this system.

7.3 Problems Faced

The biggest challenge faced was getting hold of the needed employee information from the Human Resource Unit of the Administration Division. Another challenge was that, it was difficult for the HR to clearly define the custom report to be generated from the system.

7.4 Limitations

7.4.1 Browser support

The highly sleek and intuitive interface was made in order to improve Human Computer Interaction (HCI). However, this comes with challenges because lower versions of Internet Explorer (i.e. IE9 and lower) do not support certain features such as column-fill, column-span, align-self, backface-visibility etc. Therefore the system is best viewed with all major browsers and Internet Explorer 9 or higher.

7.5 Future Work

7.5.1 Integration with payroll system

In order for the system to be more comprehensive, the system development team recommend an integration of the system to a payroll system that will enable employees view and download their pay slips on demand.

7.5.2 Information archiving

A system holding all the employee information should also contain a soft copy of all the hard copies of employee documents in file cabinet. This can be made possible by scanning these documents and attaching them to their respective employee records in the system.

7.6 Conclusion

In this chapter, the results were discussed, limitations and problems encountered were elaborated. Future recommendations for the extension and improvement of the system have also been discussed as well as an assessment of achieved functionality. There is no doubt that the human resource information system (HRIS) developed would be an asset to the CSIR- Food Research Institute.

8.0 REFERENCES

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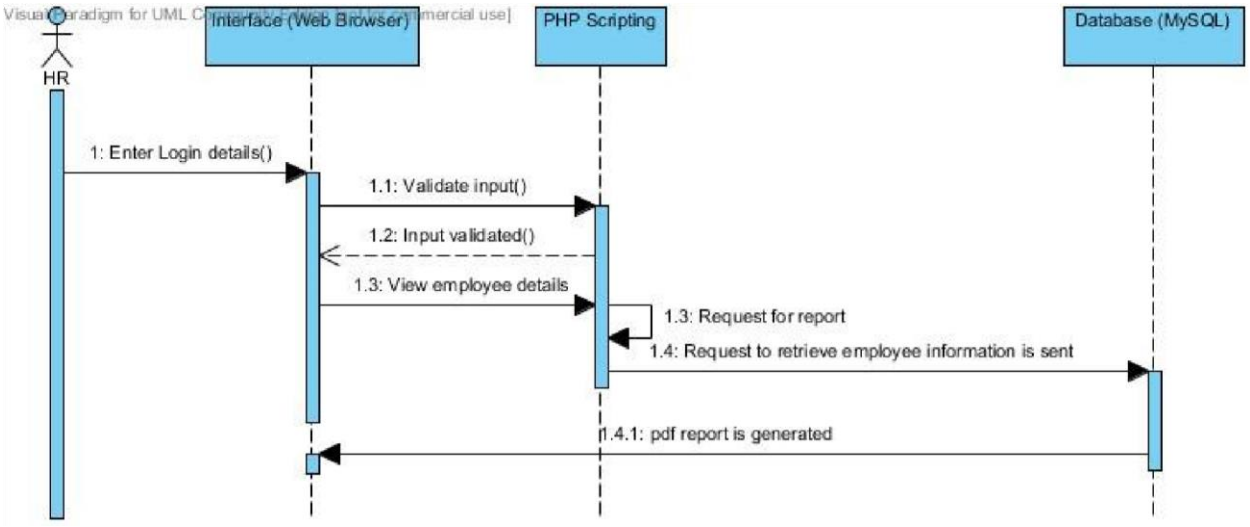
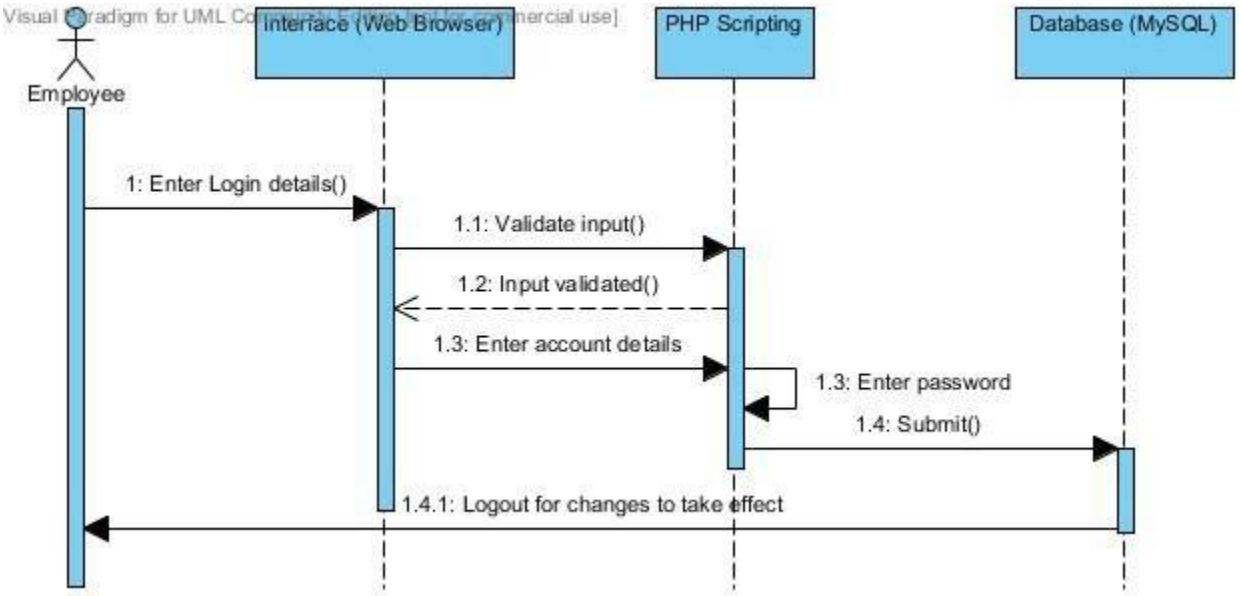
9.0 APPENDIX

9.1 Appendix A – Sequence Diagrams

9.1.1 Report generation



9.1.2 Edit account details



9.2 Appendix B – Sample Code

9.2.1 Database Connectivity

```
$active_group = 'default';
$active_record = TRUE;
$db['default']['hostname'] = 'localhost';
$db['default']['username'] = 'root';
$db['default']['password'] = 'root';
$db['default']['database'] = 'emp_db';
$db['default']['dbdriver'] = 'mysql';
$db['default']['dbprefix'] = '';
$db['default']['pconnect'] = TRUE;
$db['default']['db_debug'] = TRUE;
$db['default']['cache_on'] = FALSE;
$db['default']['cachedir'] = '';
$db['default']['char_set'] = 'utf8';
$db['default']['dbcollat'] = 'utf8_general_ci';
$db['default']['swap_pre'] = '';
$db['default']['autoinit'] = TRUE;
$db['default']['stricton'] = FALSE;
```

9.2.2 User Authentication

```
<?php class auth extends CI_Model { function_construct()
{
      // Call the Model constructor        parent::__construct();
   }
    // login function
         function authenticate($username,$password)
         {
         $query = $this->db->query("select * from users where username=
'".$username."' and password ='".md5($password)."'");         return
$query->row_array();
         }
function activity($userid,$activity)
   {
    $sql="insert into activity_log(emp_id,activity) values('".$userid."','".$activity."')";
    $this->db->query($sql);
   }
function
updateuserdetails($userid,$firstname,$lastname,$username,$password,$profil epic){
    $sql="update users set
fname='".$firstname."',lname='".$lastname."',username='".$username."',passw
ord='".md5($password)."',profile_pic='".$profilepic."' where users_id='".$userid."'";
    $this->db->query($sql);
   }
}
```

9.2.3 PDF Library

```
<?php if (!defined('BASEPATH')) exit('No direct script access allowed'); class pdf
{    function pdf()
   {
      $CI = & get_instance();
      log_message('Debug', 'mPDF class is loaded.');
   }
   function load($param=NULL)
   {
      include_once APPPATH.'/third_party/mpdf/mpdf.php';              if
($params == NULL)
      {
         $param = '"en-GB-x","A4","","",10,10,10,10,6,3';
      }
return new mPDF($param);
   }
}
```

9.2.4 Leave Application

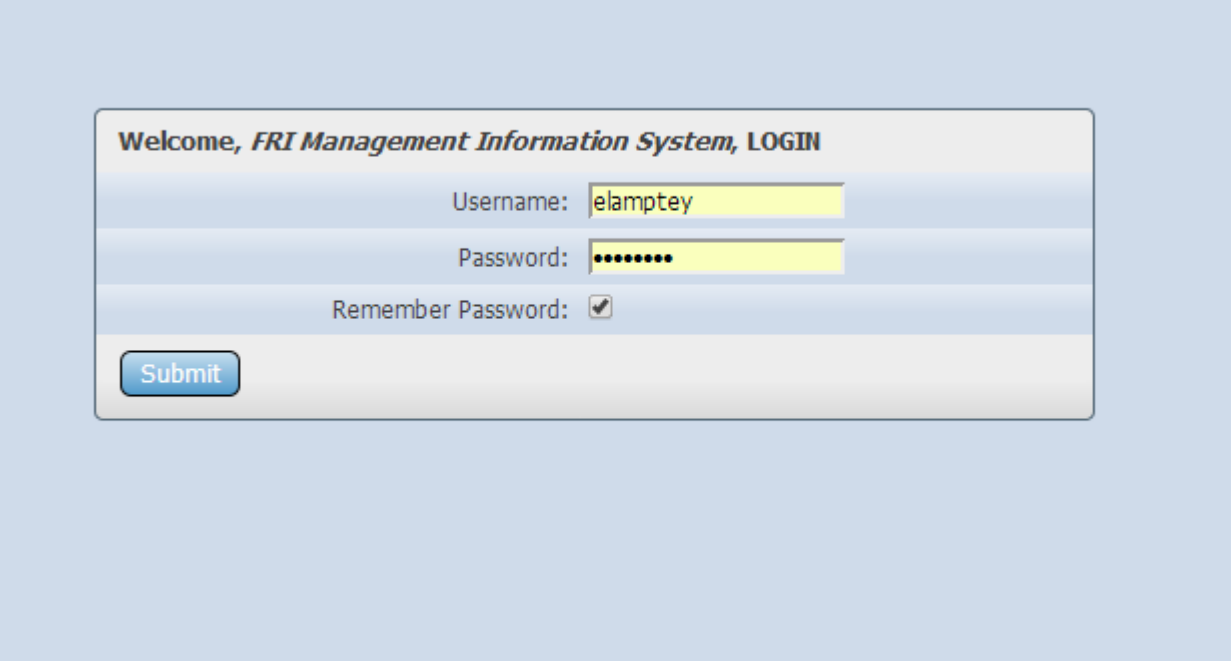
```
function leaveapplication($employeeid,$type,$message,$filename){
$this->db->query("INSERT INTO emp_db.leaves(
`leave_id` ,
`employee_id` ,
`submission_date` ,
`leave_type` ,
`leave_start` ,
`leave_end` ,
`application_message` ,
`reply_message` ,
`leave_status` ,
`attachment`
)
VALUES (
NULL , '".$employeeid."', '".date('Y/m/d')."', '$type', NULL , NULL , '".$message."', NULL
, 'pending','".$filename."'
)" );
$sql3="select DepartmentID from employee where EmployeeID='".$employeeid."'";
$result=$this->db->query($sql3);
$res=$result->row_array();
if($this->session->userdata('users_role')!='hod'){
$this->db->query("insert into notifications
(department_id,emp_id,notes,noticeto)values('".$res['DepartmentID']."','".$employeeid."',
'Leave application by employee of employee id:','hod') ");
}
}
function leaveinfo($empid){
$query = $this->db->query("SELECT
leave_status,submission_date,response_date,leave_start,leave_end,reply_message,attachme
nt,(leave_end-leave_start) as accepted_days,(date(Now())-leave_start) as days_accrued
FROM `leaves` WHERE employee_id='".$empid."'");
return $query->result_array();
}
```

9.2.5 Create new project and add member

```
function newproject($projecttitle,$startdate,$enddate,$projectnotes,$createdby){
$this->db->query("insert into projects(project_title,project_startdate,project_enddate,project_notes,createdby) values('".$projecttitle."','".$startdate."','".$enddate."','".$projectnotes."','".$createdby."') ");
}
function newprojectmember($projectid,$empid,$position){
$this->db->query("insert into project_members(project_id,employee_id,position)values('".$projectid."','".$empid."','".$position."')");
$sql3="select * from employee where EmployeeID='".$empid."'";
$result=$this->db->query($sql3);
$res=$result->row_array();
$this->db->query("insert into notifications (department_id,emp_id,notes,noticeto)values('".$res['DepartmentID']."','".$res['EmployeeID']."','Your hae been added to a new Project:','emp') ");
```

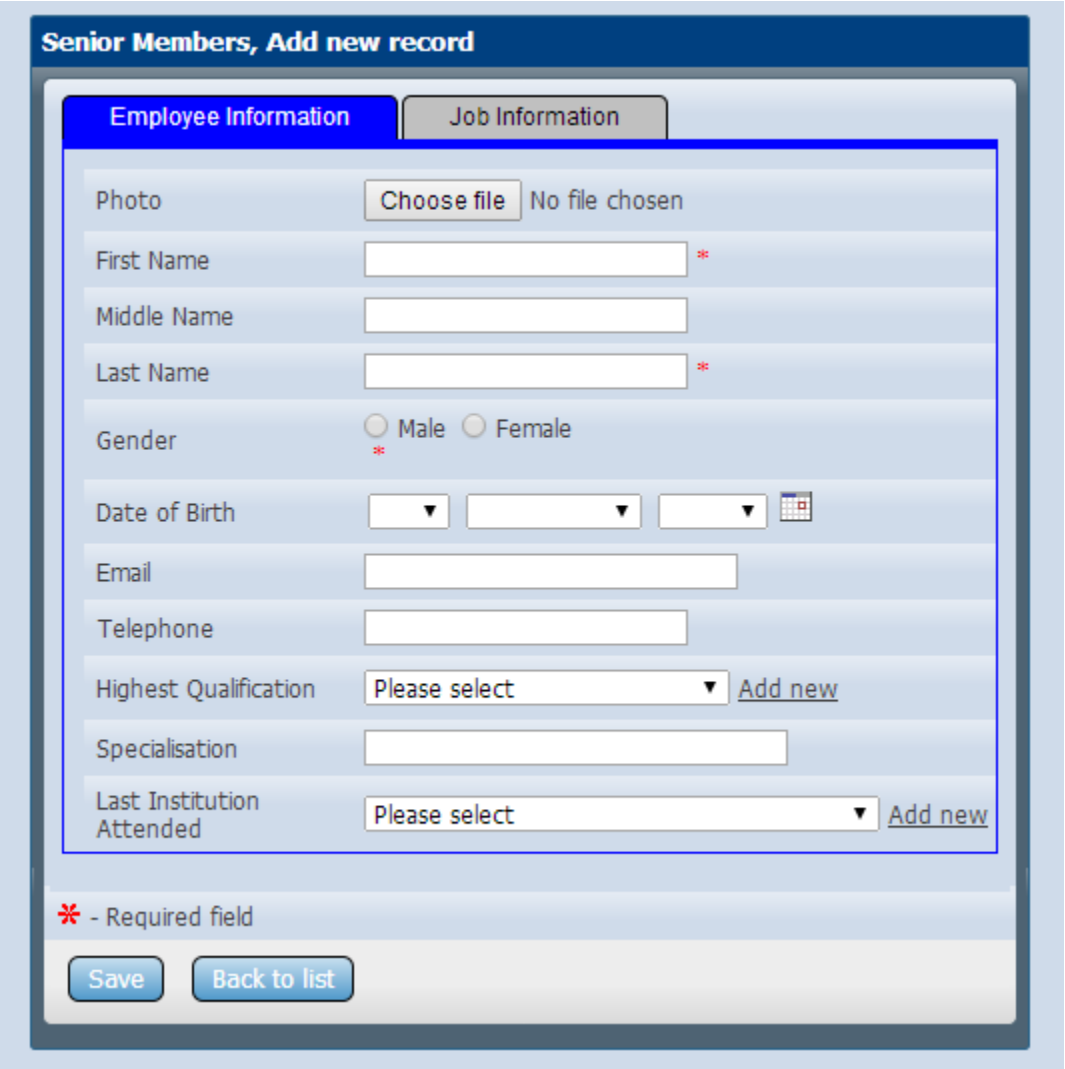
9.3 Appendix C – Screen shots of developed system

9.3.1 Login Page

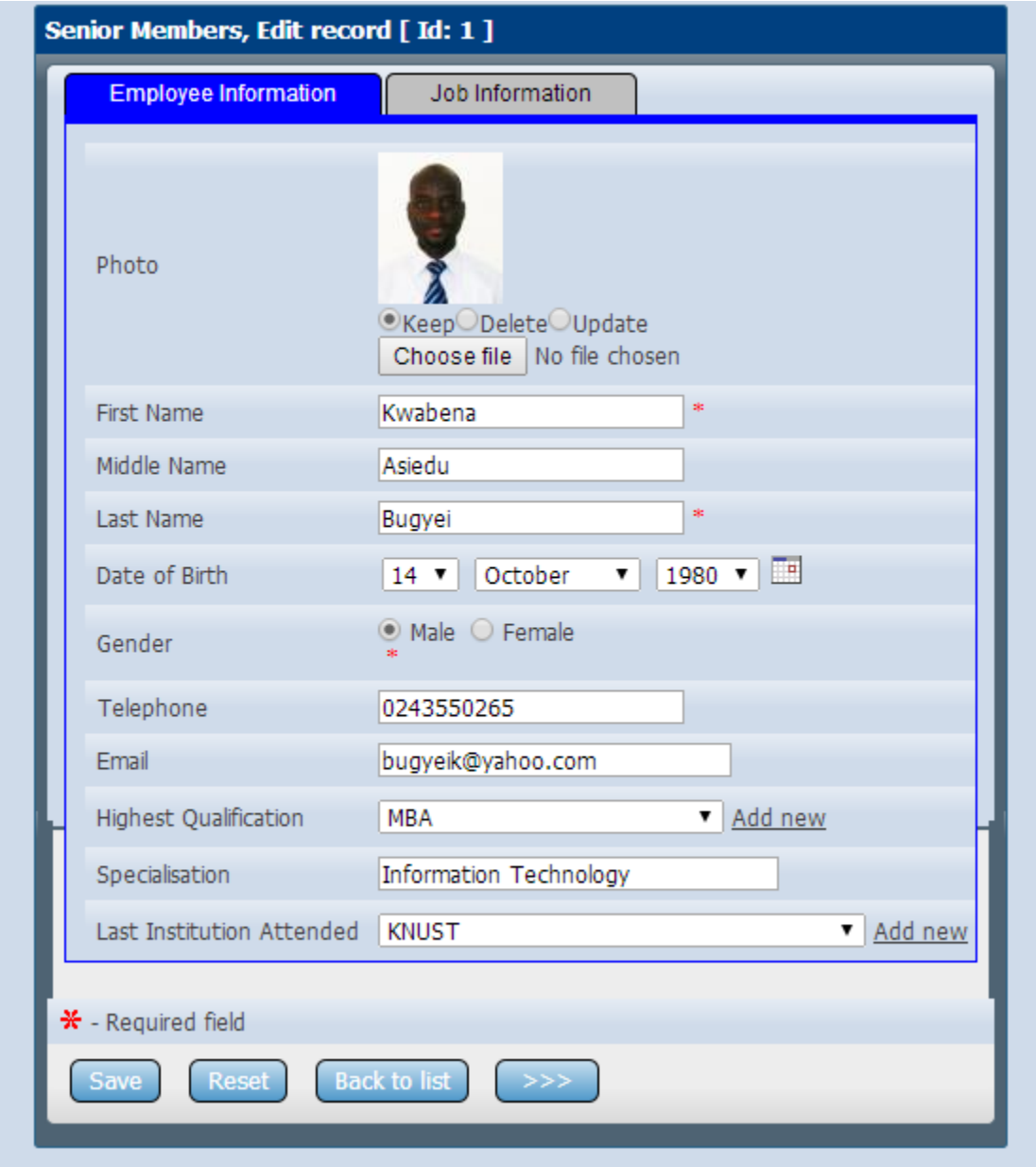


9.3.2 Menu Page

9.3.3 Add Employee form



9.3.4 Edit Employee Information



9.3.5 Employee information management

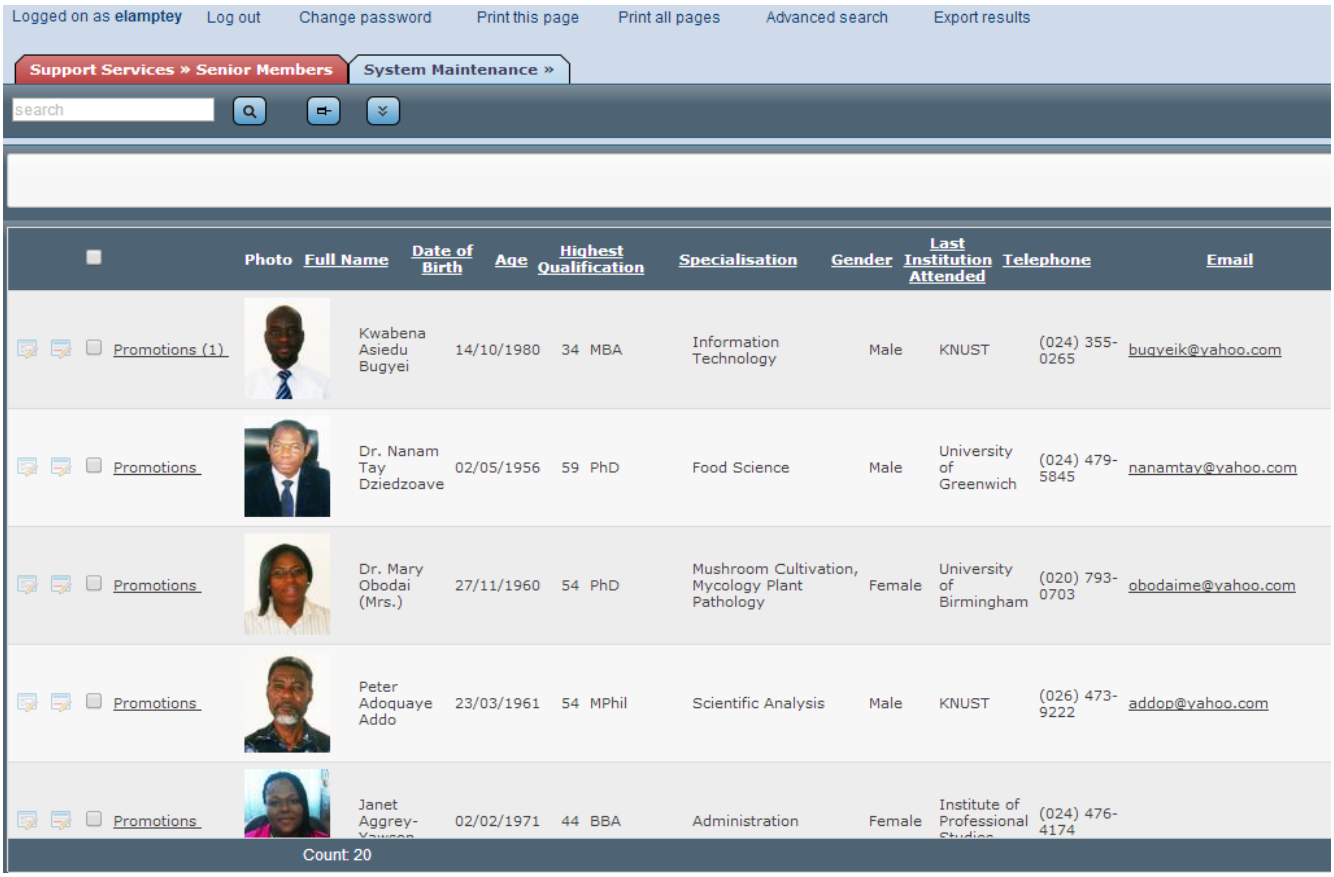


	Photo	Full Name	Date of Birth	Age	Highest Qualification	Specialisation	Gender	Last Institution Attended	Telephone	Email
Promotions (1)		Kwabena Asiedu Bugyei	14/10/1980	34	MBA	Information Technology	Male	KNUST	(024) 355-0265	bugyeik@yahoo.com
Promotions		Dr. Nanam Tay Dziedzoave	02/05/1956	59	PhD	Food Science	Male	University of Greenwich	(024) 479-5845	nanamtay@yahoo.com
Promotions		Dr. Mary Obodai (Mrs.)	27/11/1960	54	PhD	Mushroom Cultivation, Mycology Plant Pathology	Female	University of Birmingham	(020) 793-0703	obodaime@yahoo.com
Promotions		Peter Adoquaye Addo	23/03/1961	54	MPhil	Scientific Analysis	Male	KNUST	(026) 473-9222	addop@yahoo.com
Promotions		Janet Aggrey-Yawson	02/02/1971	44	BBA	Administration	Female	Institute of Professional Studies	(024) 476-4174	

Count: 20

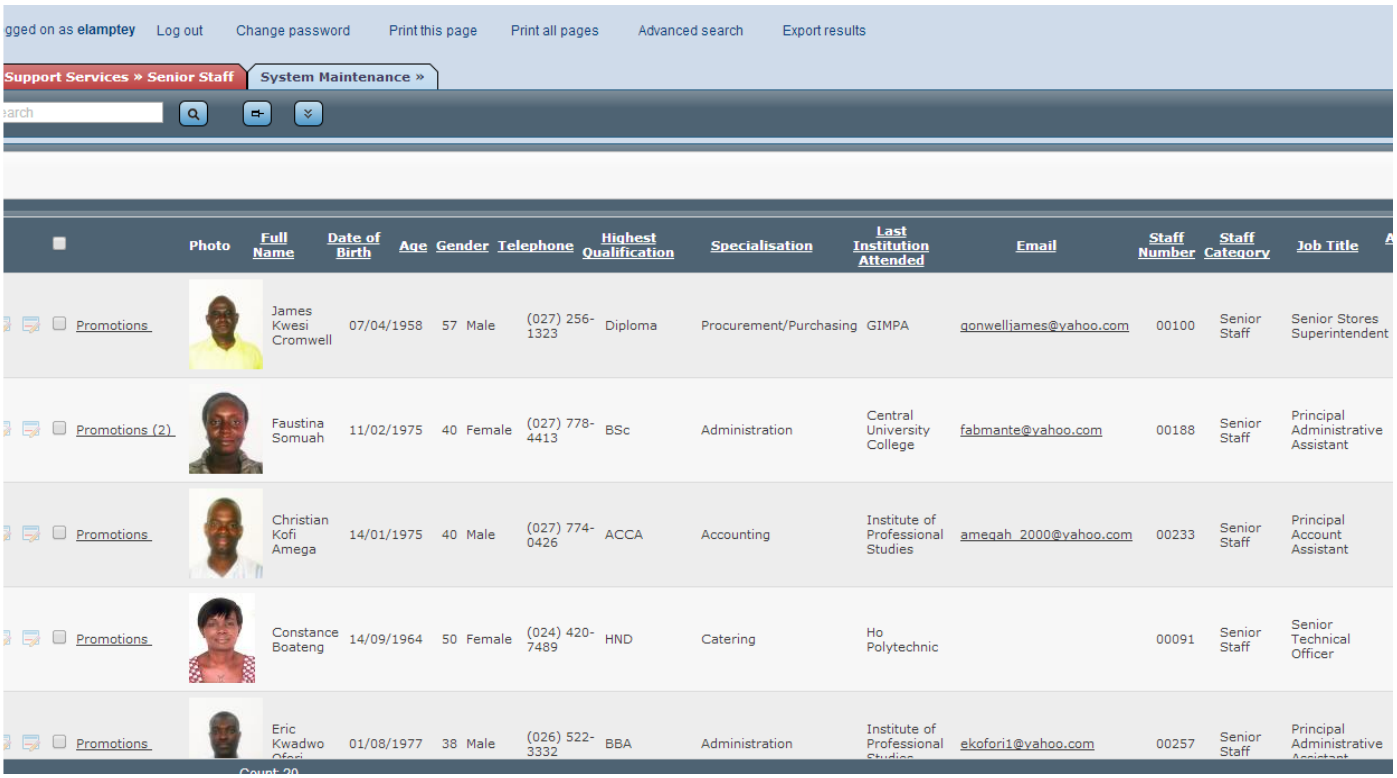


	Photo	Full Name	Date of Birth	Age	Gender	Telephone	Highest Qualification	Specialisation	Last Institution Attended	Email	Staff Number	Staff Category	Job Title
Promotions		James Kwesi Cromwell	07/04/1958	57	Male	(027) 256-1323	Diploma	Procurement/Purchasing	GIMPA	gonwelljames@yahoo.com	00100	Senior Staff	Senior Stores Superintendent
Promotions (2)		Faustina Somuah	11/02/1975	40	Female	(027) 778-4413	BSc	Administration	Central University College	fabmante@yahoo.com	00188	Senior Staff	Principal Administrative Assistant
Promotions		Christian Kofi Amega	14/01/1975	40	Male	(027) 774-0426	ACCA	Accounting	Institute of Professional Studies	amegah_2000@yahoo.com	00233	Senior Staff	Principal Account Assistant
Promotions		Constance Boateng	14/09/1964	50	Female	(024) 420-7489	HND	Catering	Ho Polytechnic		00091	Senior Staff	Senior Technical Officer
Promotions		Eric Kwadwo	01/08/1977	38	Male	(026) 522-3332	BBA	Administration	Institute of Professional	ekofori1@yahoo.com	00257	Senior Staff	Principal Administrative

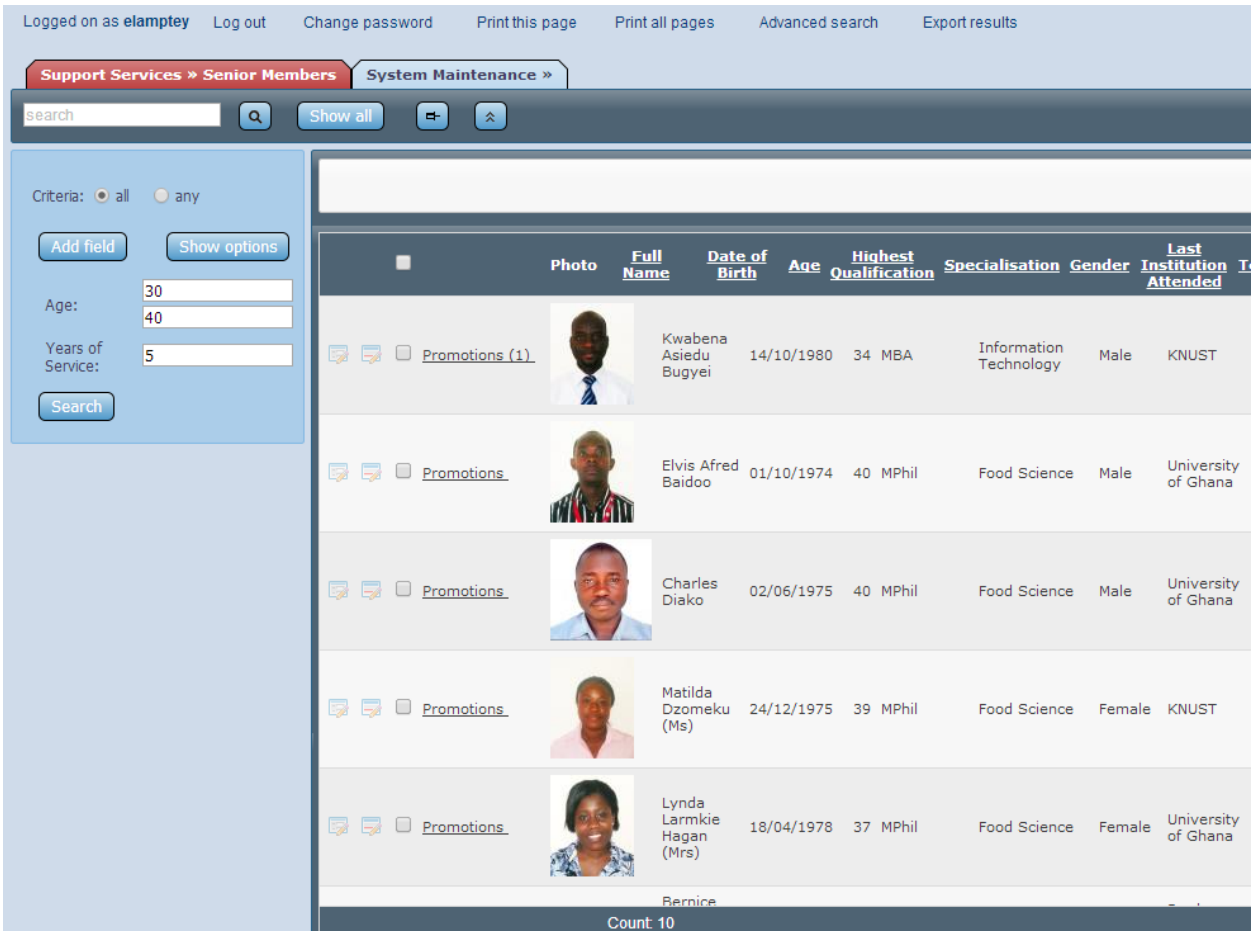
9.3.6 View Employee Information

Employee, View record [Id: 6]

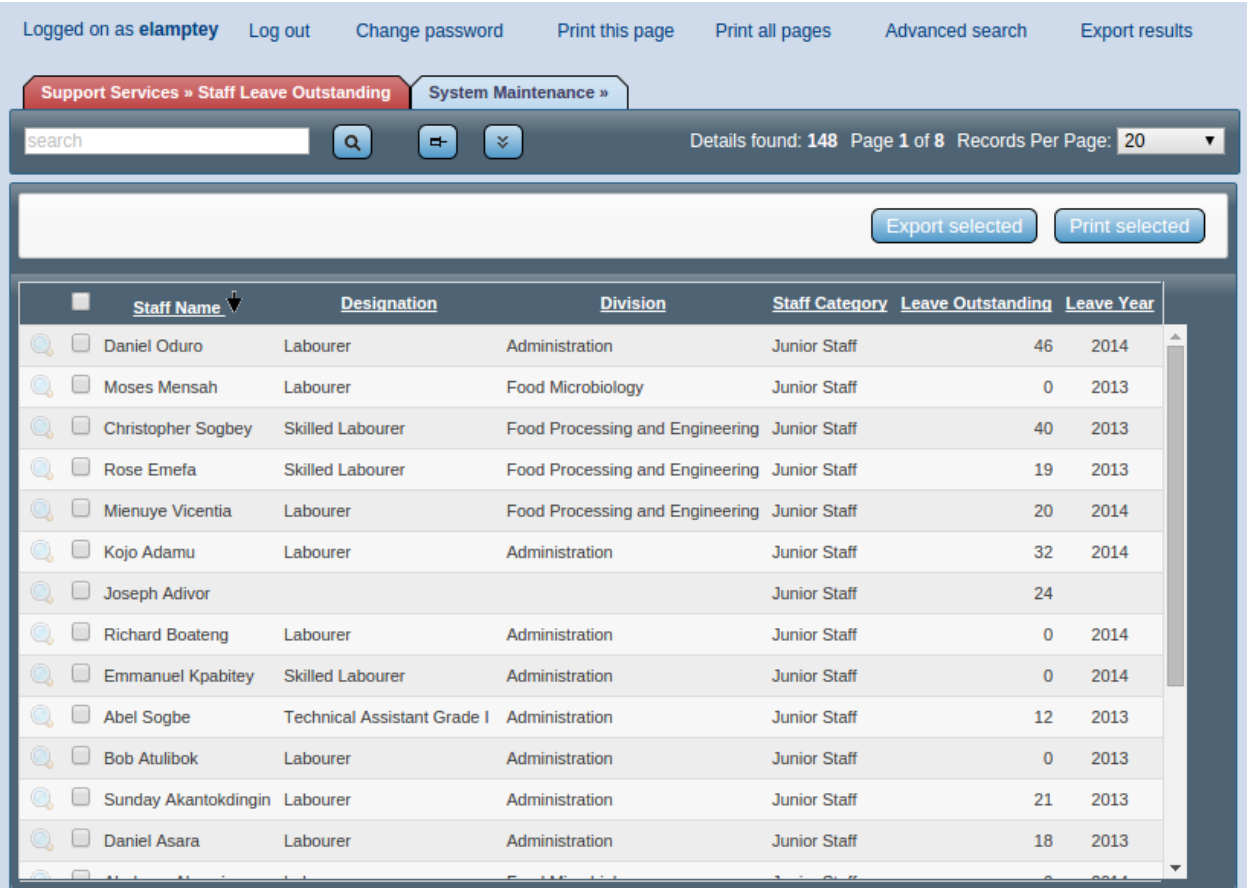
Photo	
Full Name	James Kwesi Cromwell
First Name	James
Date of Birth	07/04/1958
Middle Name	Kwesi
Age	57
Last Name	Cromwell
Gender	Male
Telephone	(027) 256-1323
Highest Qualification	Diploma
Specialisation	Procurement/Purchasing
Last Institution Attended	GIMPA
Email	gonwelljames@yahoo.com
Staff Number	00100
Staff Category	Senior Staff
Job Title	Senior Stores Superintendent
Appointment Date	01/06/1977
Years of Service	38
Last Promotion Date	01/01/2008
Position	
Division	Finance and Accounts
Unit	Stores Unit
Location	Okponglo Site
Employment Status	Full-Time

<<< Back to list >>>

9.3.7 Advanced Search in the system

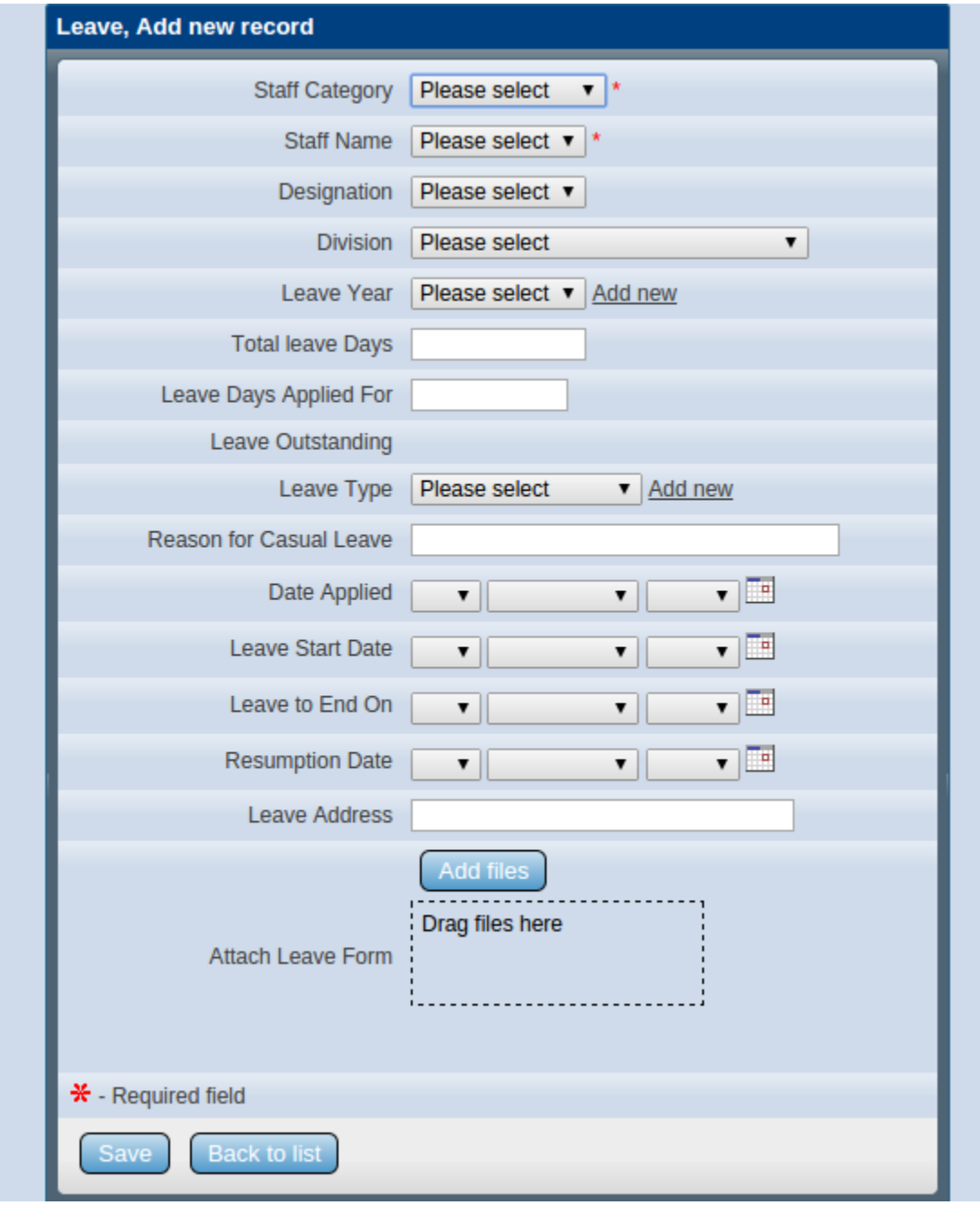


9.3.8 Leave management

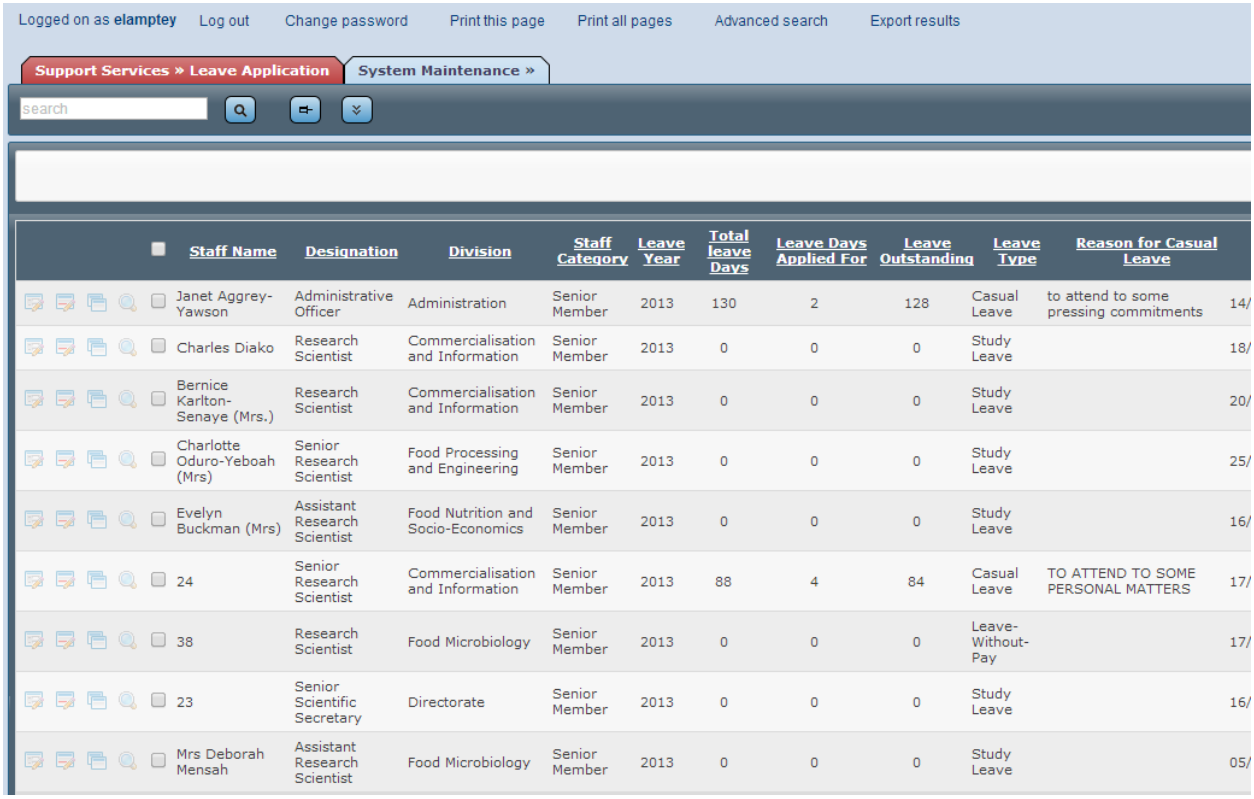


Staff Name	Designation	Division	Staff Category	Leave Outstanding	Leave Year
Daniel Oduro	Labourer	Administration	Junior Staff	46	2014
Moses Mensah	Labourer	Food Microbiology	Junior Staff	0	2013
Christopher Sogbey	Skilled Labourer	Food Processing and Engineering	Junior Staff	40	2013
Rose Emefa	Skilled Labourer	Food Processing and Engineering	Junior Staff	19	2013
Mienuye Vicentia	Labourer	Food Processing and Engineering	Junior Staff	20	2014
Kojo Adamu	Labourer	Administration	Junior Staff	32	2014
Joseph Adivor			Junior Staff	24	
Richard Boateng	Labourer	Administration	Junior Staff	0	2014
Emmanuel Kpabitey	Skilled Labourer	Administration	Junior Staff	0	2014
Abel Sogbe	Technical Assistant Grade I	Administration	Junior Staff	12	2013
Bob Atulibok	Labourer	Administration	Junior Staff	0	2013
Sunday Akantokdingin	Labourer	Administration	Junior Staff	21	2013
Daniel Asara	Labourer	Administration	Junior Staff	18	2013

9.3.9 Leave form

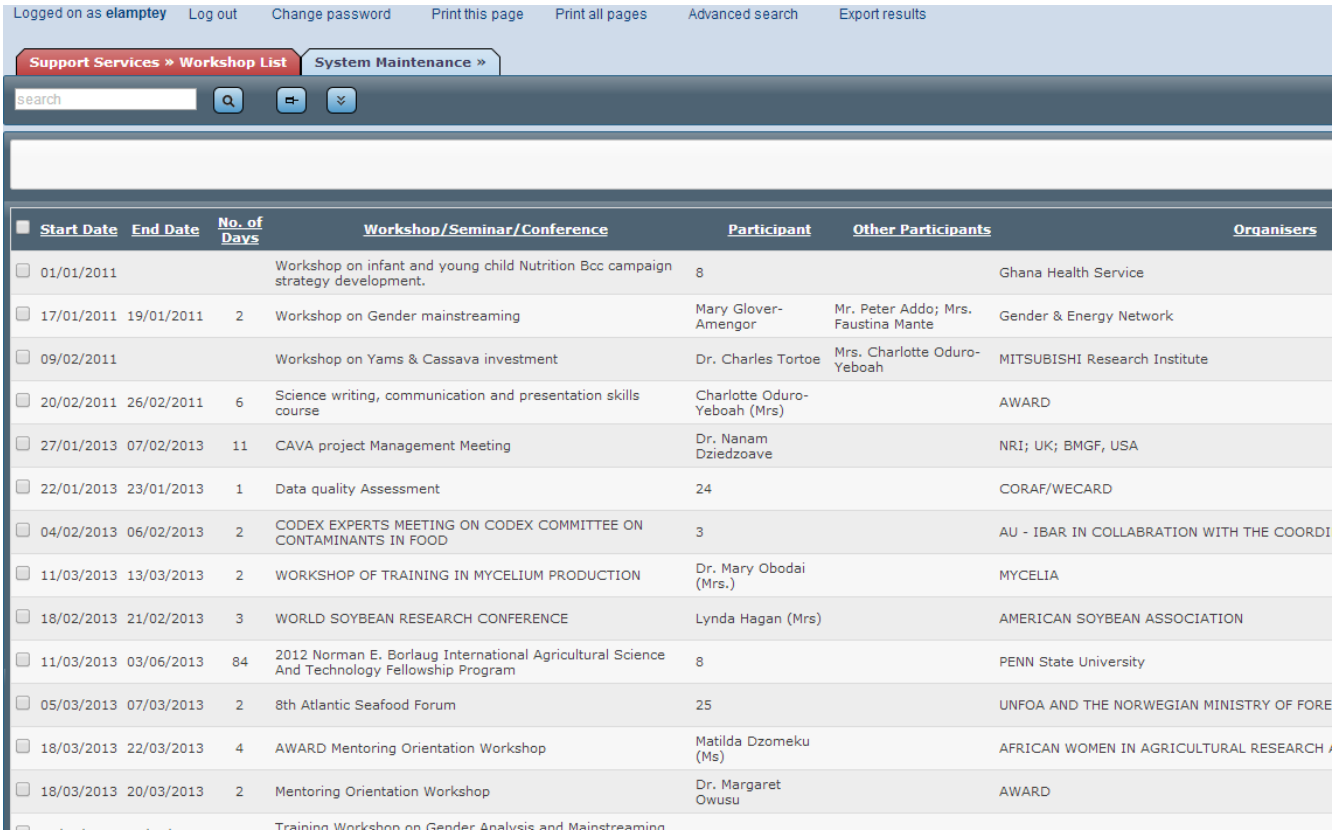


9.3.10 Leave Application



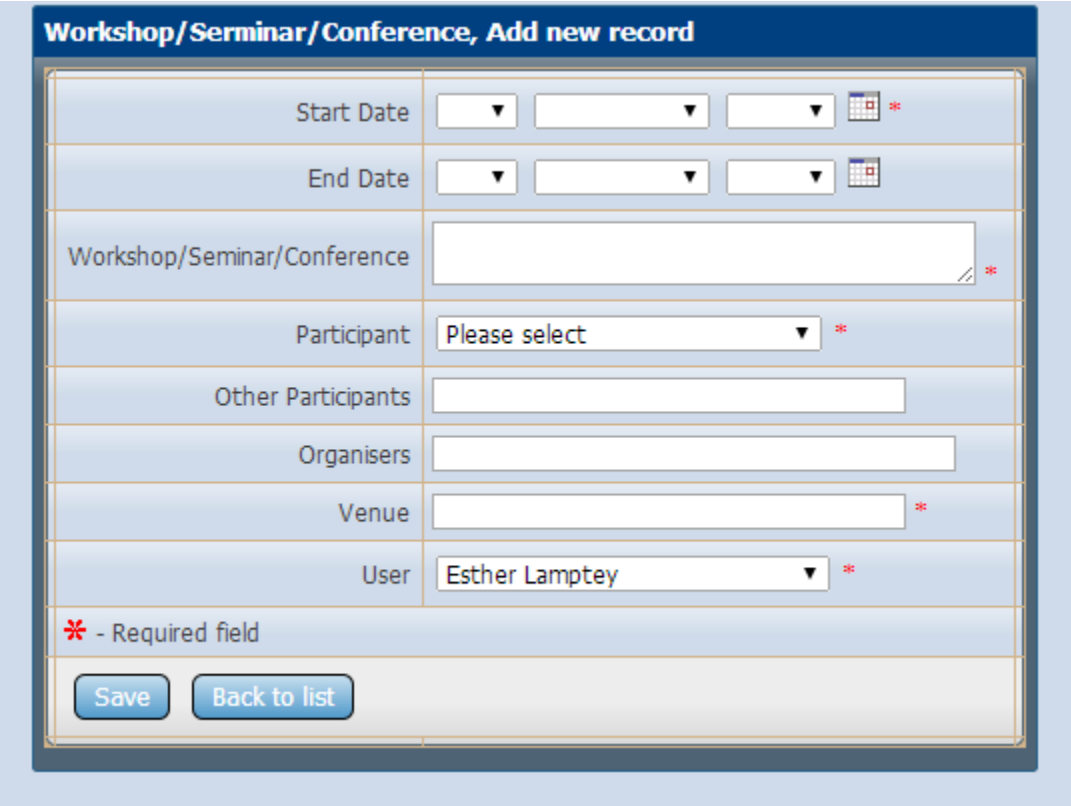
Staff Name	Designation	Division	Staff Category	Leave Year	Total leave Days	Leave Days Applied For	Leave Outstanding	Leave Type	Reason for Casual Leave	
Janet Aggrey-Yawson	Administrative Officer	Administration	Senior Member	2013	130	2	128	Casual Leave	to attend to some pressing commitments	14/
Charles Diako	Research Scientist	Commercialisation and Information	Senior Member	2013	0	0	0	Study Leave		18/
Bernice Karlton-Senaye (Mrs.)	Research Scientist	Commercialisation and Information	Senior Member	2013	0	0	0	Study Leave		20/
Charlotte Oduro-Yeboah (Mrs)	Senior Research Scientist	Food Processing and Engineering	Senior Member	2013	0	0	0	Study Leave		25/
Evelyn Buckman (Mrs)	Assistant Research Scientist	Food Nutrition and Socio-Economics	Senior Member	2013	0	0	0	Study Leave		16/
24	Senior Research Scientist	Commercialisation and Information	Senior Member	2013	88	4	84	Casual Leave	TO ATTEND TO SOME PERSONAL MATTERS	17/
38	Research Scientist	Food Microbiology	Senior Member	2013	0	0	0	Leave-Without-Pay		17/
23	Senior Scientific Secretary	Directorate	Senior Member	2013	0	0	0	Study Leave		16/
Mrs Deborah Mensah	Assistant Research Scientist	Food Microbiology	Senior Member	2013	0	0	0	Study Leave		05/

9.3.11 Workshop and Conferences management

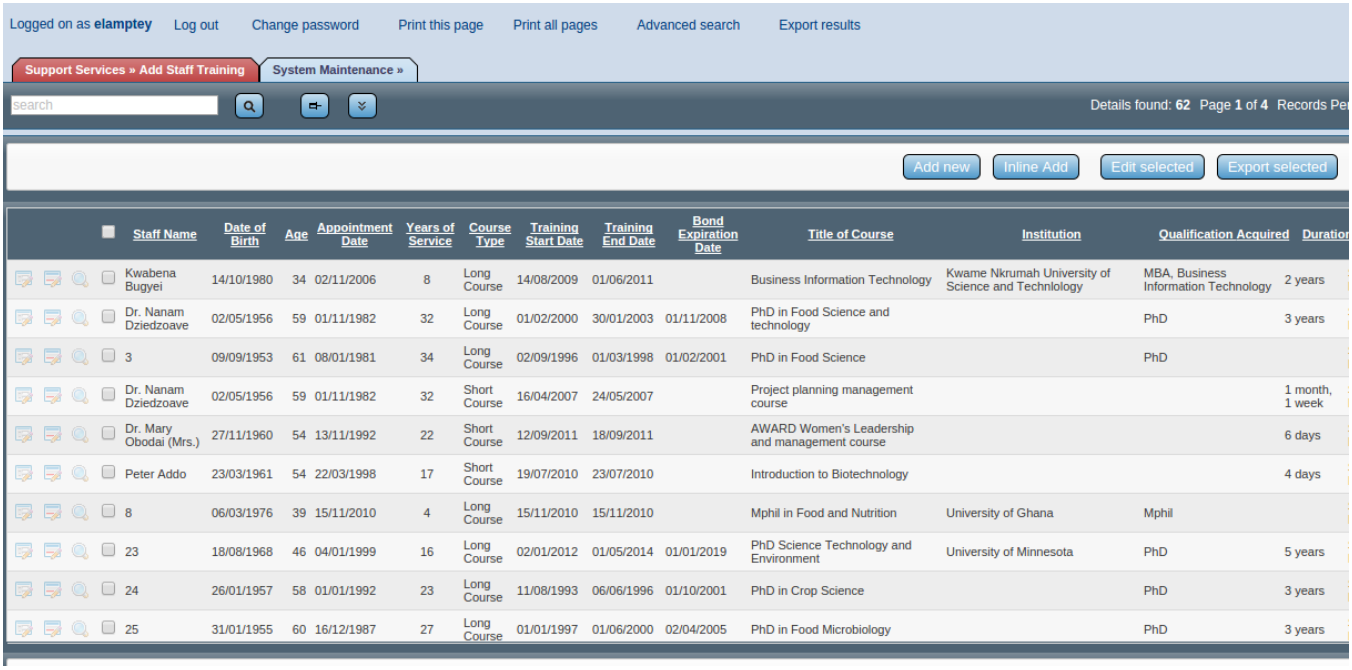


Start Date	End Date	No. of Days	Workshop/Seminar/Conference	Participant	Other Participants	Organisers
01/01/2011			Workshop on infant and young child Nutrition Bcc campaign strategy development.	8		Ghana Health Service
17/01/2011	19/01/2011	2	Workshop on Gender mainstreaming	Mary Glover-Amengor	Mr. Peter Addo; Mrs. Faustina Mante	Gender & Energy Network
09/02/2011			Workshop on Yams & Cassava investment	Dr. Charles Tortoe	Mrs. Charlotte Oduro-Yeboah	MITSUBISHI Research Institute
20/02/2011	26/02/2011	6	Science writing, communication and presentation skills course	Charlotte Oduro-Yeboah (Mrs)		AWARD
27/01/2013	07/02/2013	11	CAVA project Management Meeting	Dr. Nanam Dziedzoave		NRI; UK; BMGF, USA
22/01/2013	23/01/2013	1	Data quality Assessment	24		CORAF/WECARD
04/02/2013	06/02/2013	2	CODEX EXPERTS MEETING ON CODEX COMMITTEE ON CONTAMINANTS IN FOOD	3		AU - IBAR IN COLLABRATION WITH THE COORDI
11/03/2013	13/03/2013	2	WORKSHOP OF TRAINING IN MYCELIUM PRODUCTION	Dr. Mary Obodai (Mrs.)		MYCELIA
18/02/2013	21/02/2013	3	WORLD SOYBEAN RESEARCH CONFERENCE	Lynda Hagan (Mrs)		AMERICAN SOYBEAN ASSOCIATION
11/03/2013	03/06/2013	84	2012 Norman E. Borlaug International Agricultural Science And Technology Fellowship Program	8		PENN State University
05/03/2013	07/03/2013	2	8th Atlantic Seafood Forum	25		UNFOA AND THE NORWEGIAN MINISTRY OF FORE
18/03/2013	22/03/2013	4	AWARD Mentoring Orientation Workshop	Matilda Dzomeku (Ms)		AFRICAN WOMEN IN AGRICULTURAL RESEARCH
18/03/2013	20/03/2013	2	Mentoring Orientation Workshop	Dr. Margaret Owusu		AWARD
			Training Workshop on Gender Analysis and Mainstreaming			

9.3.12 Workshop and Conferences form



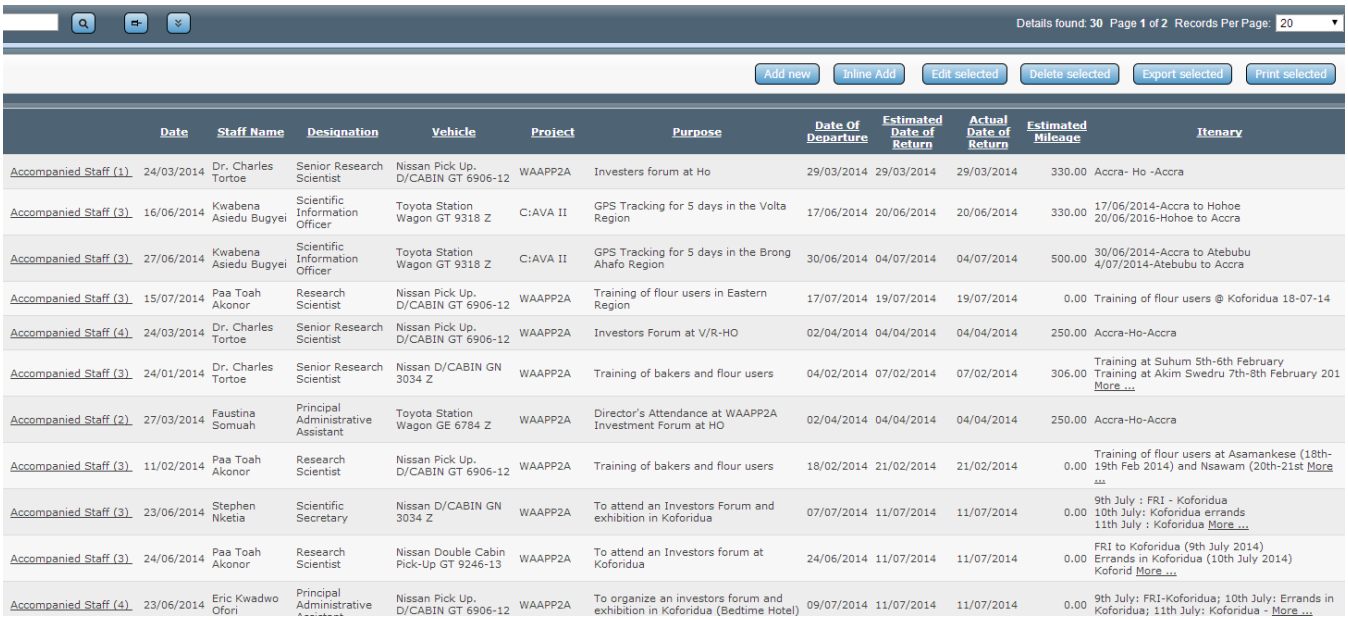
9.3.13 Staff Training management



Staff Name	Date of Birth	Age	Appointment Date	Years of Service	Course Type	Training Start Date	Training End Date	Bond Expiration Date	Title of Course	Institution	Qualification Acquired	Duratio
Kwabena Bugyei	14/10/1980	34	02/11/2006	8	Long Course	14/08/2009	01/06/2011		Business Information Technology	Kwame Nkrumah University of Science and Technlology	MBA, Business Information Technology	2 years
Dr. Nanam Dziedzoave	02/05/1956	59	01/11/1982	32	Long Course	01/02/2000	30/01/2003	01/11/2008	PhD in Food Science and technology		PhD	3 years
3	09/09/1953	61	08/01/1981	34	Long Course	02/09/1996	01/03/1998	01/02/2001	PhD in Food Science		PhD	
Dr. Nanam Dziedzoave	02/05/1956	59	01/11/1982	32	Short Course	16/04/2007	24/05/2007		Project planning management course			1 month, 1 week
Dr. Mary Obodai (Mrs.)	27/11/1960	54	13/11/1992	22	Short Course	12/09/2011	18/09/2011		AWARD Women's Leadership and management course			6 days
Peter Addo	23/03/1961	54	22/03/1998	17	Short Course	19/07/2010	23/07/2010		Introduction to Biotechnology			4 days
8	06/03/1976	39	15/11/2010	4	Long Course	15/11/2010	15/11/2010		Mphil in Food and Nutrition	University of Ghana	Mphil	
23	18/08/1968	46	04/01/1999	16	Long Course	02/01/2012	01/05/2014	01/01/2019	PhD Science Technology and Environment	University of Minnesota	PhD	5 years
24	26/01/1957	58	01/01/1992	23	Long Course	11/08/1993	06/06/1996	01/10/2001	PhD in Crop Science		PhD	3 years
25	31/01/1955	60	16/12/1987	27	Long Course	01/01/1997	01/06/2000	02/04/2005	PhD in Food Microbiology		PhD	3 years

9.3.14 Training Form

9.3.15 Local and International Travels Management

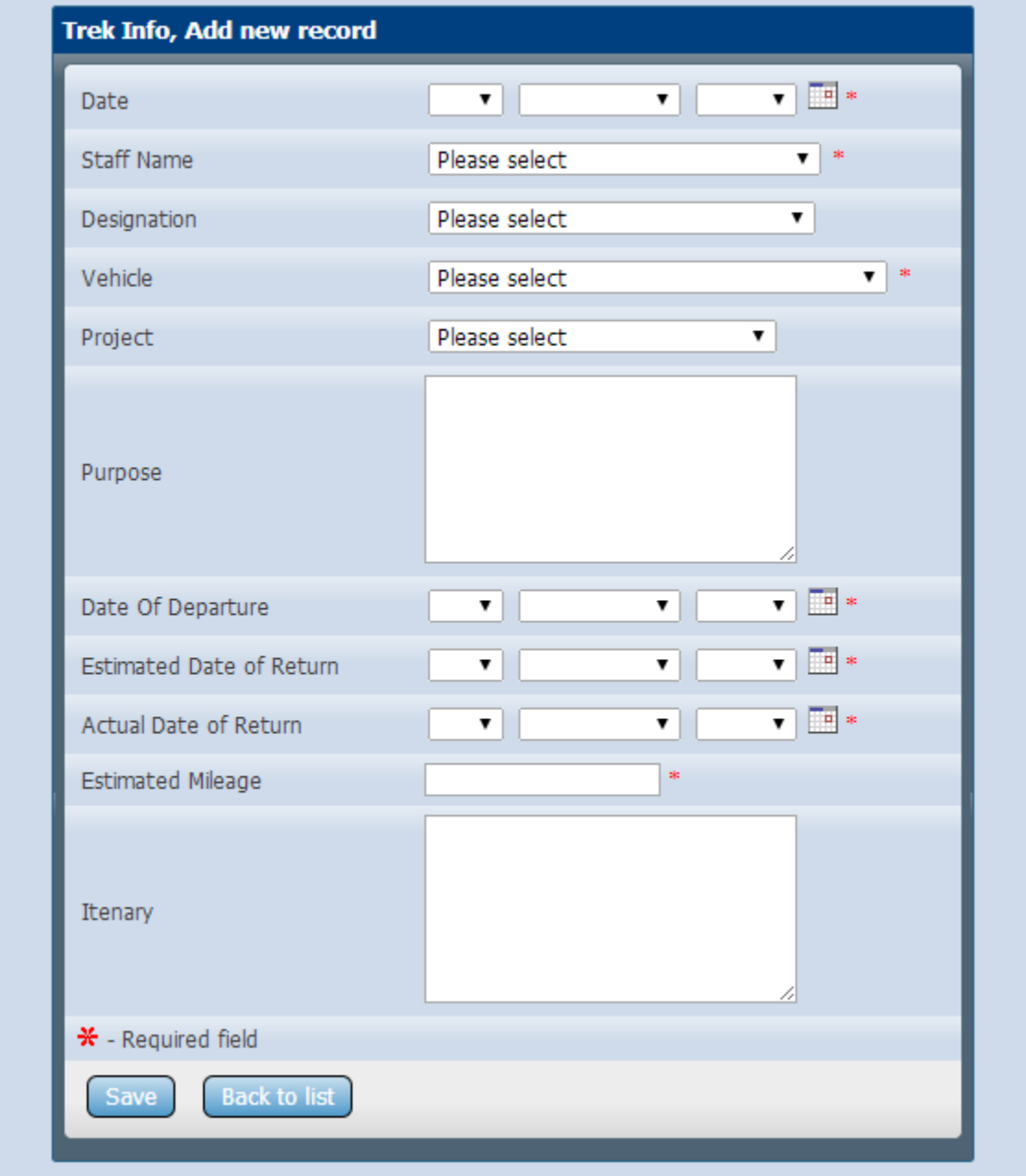


Details found: 30 Page 1 of 2 Records Per Page: 20

Add new | Inline Add | Edit selected | Delete selected | Export selected | Print selected

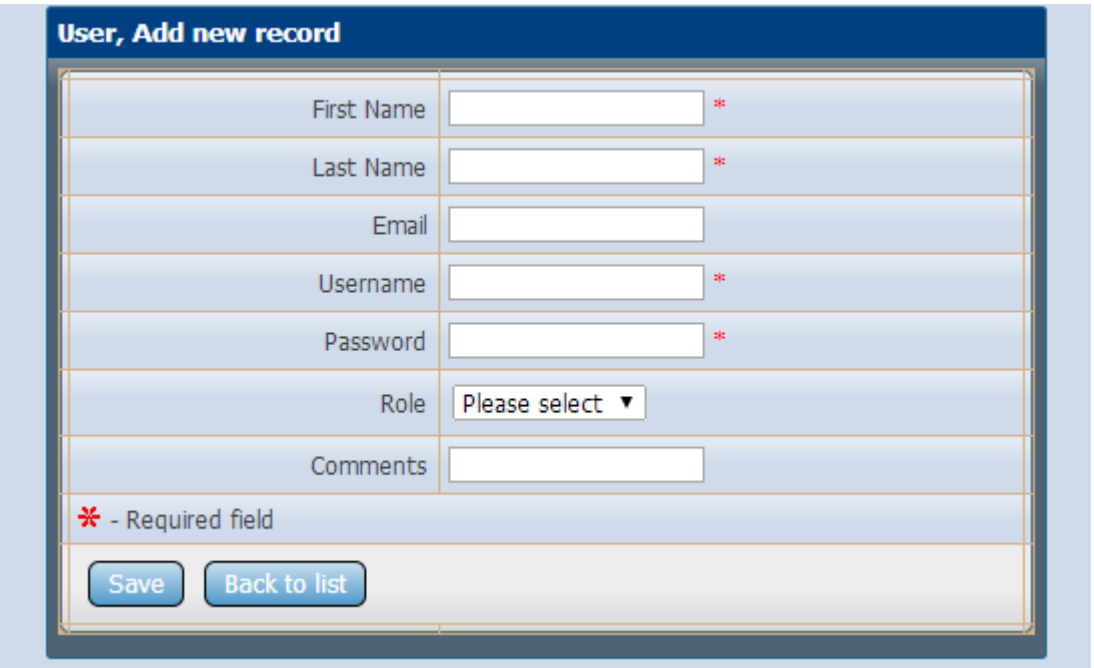
	Date	Staff Name	Designation	Vehicle	Project	Purpose	Date Of Departure	Estimated Date of Return	Actual Date of Return	Estimated Mileage	Itenary
Accompanied Staff (1)	24/03/2014	Dr. Charles Tortoe	Senior Research Scientist	Nissan Pick Up. D/CABIN GT 6906-12	WAAPP2A	Investers forum at Ho	29/03/2014	29/03/2014	29/03/2014	330.00	Accra- Ho -Accra
Accompanied Staff (3)	16/06/2014	Kwabena Asiedu Bugyei	Scientific Information Officer	Toyota Station Wagon GT 9318 Z	C:AVA II	GPS Tracking for 5 days in the Volta Region	17/06/2014	20/06/2014	20/06/2014	330.00	17/06/2014-Accra to Hohoe 20/06/2016-Hohoe to Accra
Accompanied Staff (3)	27/06/2014	Kwabena Asiedu Bugyei	Scientific Information Officer	Toyota Station Wagon GT 9318 Z	C:AVA II	GPS Tracking for 5 days in the Brong Ahafo Region	30/06/2014	04/07/2014	04/07/2014	500.00	30/06/2014-Accra to Atebubu 4/07/2014-Atebubu to Accra
Accompanied Staff (3)	15/07/2014	Paa Toah Akonor	Research Scientist	Nissan Pick Up. D/CABIN GT 6906-12	WAAPP2A	Training of flour users in Eastern Region	17/07/2014	19/07/2014	19/07/2014	0.00	Training of flour users @ Koforidua 18-07-14
Accompanied Staff (4)	24/03/2014	Dr. Charles Tortoe	Senior Research Scientist	Nissan Pick Up. D/CABIN GT 6906-12	WAAPP2A	Investors Forum at V/R-HO	02/04/2014	04/04/2014	04/04/2014	250.00	Accra-Ho-Accra
Accompanied Staff (3)	24/01/2014	Dr. Charles Tortoe	Senior Research Scientist	Nissan D/CABIN GN 3034 Z	WAAPP2A	Training of bakers and flour users	04/02/2014	07/02/2014	07/02/2014	306.00	Training at Suhum 5th-6th February Training at Akim Swedru 7th-8th February 201 More ...
Accompanied Staff (2)	27/03/2014	Faustina Somuah	Principal Administrative Assistant	Toyota Station Wagon GE 6784 Z	WAAPP2A	Director's Attendance at WAAPP2A Investment Forum at HO	02/04/2014	04/04/2014	04/04/2014	250.00	Accra-Ho-Accra
Accompanied Staff (3)	11/02/2014	Paa Toah Akonor	Research Scientist	Nissan Pick Up. D/CABIN GT 6906-12	WAAPP2A	Training of bakers and flour users	18/02/2014	21/02/2014	21/02/2014	0.00	Training of flour users at Asamankese (18th-19th Feb 2014) and Nsawam (20th-21st More ...
Accompanied Staff (3)	23/06/2014	Stephen Nketia	Scientific Secretary	Nissan D/CABIN GN 3034 Z	WAAPP2A	To attend an Investors Forum and exhibition in Koforidua	07/07/2014	11/07/2014	11/07/2014	0.00	9th July : FRI - Koforidua 10th July: Koforidua errands 11th July : Koforidua More ...
Accompanied Staff (3)	24/06/2014	Paa Toah Akonor	Research Scientist	Nissan Double Cabin Pick-Up GT 9246-13	WAAPP2A	To attend an Investors forum at Koforidua	24/06/2014	11/07/2014	11/07/2014	0.00	FRI to Koforidua (9th July 2014) Errands in Koforidua (10th July 2014) Koforid More ...
Accompanied Staff (4)	23/06/2014	Eric Kwadwo Ofori	Principal Administrative	Nissan Pick Up. D/CABIN GT 6906-12	WAAPP2A	To organize an investors forum and exhibition in Koforidua (Bedtime Hotel)	09/07/2014	11/07/2014	11/07/2014	0.00	9th July: FRI-Koforidua; 10th July: Errands in Koforidua; 11th July: Koforidua - More ...

9.3.16 Trek form



9.3.17 View Trek Information of Staff

9.3.18 User Account form



9.3.19 Edit User Account