



**Online Foreign Employment Agency  
Management System  
for  
JPS Recruitment & Foreign Travel Agency**

**A dissertation submitted for the Degree of Master of  
Information Technology**

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University of Colombo School of Computing  
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## Declaration

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The thesis is my original work and has not been submitted previously for a degree at this or any other university/institute. To the best of my knowledge it does not contain any material published or written by another person, except as acknowledged in the text.

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Signature

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Date

This is to certify that this thesis is based on the work of Mr. R.H. Jagath Siriwardhana under my supervision. The thesis has been prepared according to the format stipulated and is of acceptable standard.

Certified by,

**Supervisor Name** : Mr. G. Kapila A. Dias

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Signature

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Date

## Abstract

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This web based application is developed for a foreign employment agency which was located at Kurunegala. At present they do not use any software of this nature. The features and functionalities available in the application were developed based on the extensive business process analysis carried out with the owner of the business.

Object oriented concepts have been used to build the system throughout the entire development process. The open-source software used for the implementation are CodeIgniter PHP framework, Bootstrap library, jQuery Javascript library, MySQL database management system and Apache web server. It was easier to build a responsive and cross browser compatible application with the help of above tools.

Job Seekers can easily make Quick Inquires and register for SMS Job Alerts just by visiting the home page. Quick Inquiries are directed to the office email so that the staff can reply when free. A telephone call management module has been implemented to keep track of telephone conversations had with Job Seekers and Applicants. So just by looking at call history before placing a telephone call may greatly reduce the conversation time. This feature not only reduce monthly telephone bill but also keep the telephone line active. The system has separate modules to manage Job Seekers, Applicants, Sub Agents, Foreign Agents, Job Orders, Payments, Training Programs, Countries and Passport information. Payment module handle all Applicant, Sub Agent, Foreign Agent and Other expenses. All reports are generated in PDF format having the facility to save or print directly from the application. Information provided graphically and numerically on the Dashboard support management to decide when to advertise and what scale to advertise. Search facility is implemented for Job Seekers and Applicants on some given criteria which saves valuable time. Security is enforced with the implementation of user accounts with different privileges.

The application has been accepted by the client as a successful system. The new system was hosted on a commercially available server enabling the owner to access the system outside office hours and during overseas stay via a mobile device. The system was found to be easy to use and extremely helpful to save valuable time and money over the previously used manual system.

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## List of Abbreviations

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AJAX	- Asynchronous JavaScript and XML
CPU	- Central Processing Unit
CSS	- Cascading Style Sheet
DB	- Database
DBMS	- Database Management System
ER	- Entity Relationship
FTP	- File Transfer Protocol
GUI	- Graphical User Interface
HTML	- Hypertext Markup Language
HTTP	- Hypertext Transfer Protocol
HTTPS	- Hypertext Transfer Protocol Secure
JPEG	- Joint Photographic Experts Group
MIT	- Master of Information Technology
MVC	- Model, View, Controller
MySQL	- My Structured Query Language
NIC	- National Identity Card
OOP	- Object Oriented Programming
PHP	- Hypertext Preprocessor
PNG	- Portable Network Graphics
RAM	- Random Access Memory
SLBFE	- Sri Lanka Bureau of Foreign Employment
SMS	- Short Message Service
UCSC	- University of Colombo School of Computing
UML	- Unified Modeling Language
URL	- Universal Resource Locator
WWW	- World Wide Web
XAMPP	- Cross-Platform (X), Apache (A), MariaDB (M), PHP (P) and Perl (P)
XML	- eXtensible Markup Language
GHz	- Gigahertz



# **Chapter 1: Introduction**

## **1.1 Company background**

JPS Recruitment & Foreign Travel Agency (hereinafter sometimes referred to as the Agency) is one of the leading manpower recruiting agencies in Sri Lanka which was established in 2007 and registered in Sri Lankan Bureau of Foreign Employment (SLBEF) under the license number 2224. They have recruited several thousands of domestic workers (semi-skilled and labour) for various clients in middle east countries like Kuwait, Saudi Arabia, Oman, Qatar and United Arab Emirates. Their main aim is to provide an efficient and appropriate service to those seeking employment abroad, and serve as a major recruitment agency in the country.

## **1.2 Problem domain and motivation**

The agency advertises about available vacancies on TV, Radio and News Papers. Job seekers make inquiries via telephone or by visiting the agency. The details gathered from telephone or face-to-face conversations with job seekers are written on a book by the receptionist (telephone operator). At present they don't have a proper agency management system. They use paper (letters and faxes), word files (\*.doc), excel files (\*.xls) and scanned images (\*.jpg) to store data. This makes it difficult to quickly look into different queries and reports.

Although there are many telephone calls from job seekers during the day, there is no proper methodology to follow up them. Because of large number of applicants, the Agency encounters difficulties managing their payment details and travel related documents.

They are in search of a computerized system to improve the efficiency and productivity of the agency. Also the owner needs to access the system outside the Agency via a laptop.

## **1.3 Aims and objectives of the project**

The main purpose of doing this project is to automate the ongoing system with a view to reduce wastage of time and money and to enhance the profit of JPS Recruitment & Foreign Travel Agency. The following objectives are also expected to achieve.

- Develop an online web (browser) based computer system which will reduce paper work and human error in agency management.
- Ability to monitor the agency activities outside office hours and during overseas travel.



- Make a transparent computer system that will prevent staff from illegal collaborations.
- Assist to make management decisions with historical data.
- Accelerate the recruitment process.
- Save valuable time so that resources are left for more important tasks.
- Provide improved and flexible services to staff and applicants.
- Create an automated mechanism for recruiting process which will increase the efficiency and decrease the work load.

## 1.4 Scope of Project

Every job seeker needs to visit the agency to face the pre assessment. If the pre assessment is success, he/she can register as an applicant after paying the registration fee of Rs. 5,000 and handing over the passport to the agency. A job seeker becomes an applicant after the registration process. This is because some applicants say no or they go to other agencies in the middle of the recruitment process. If an applicant says no and asks for the passport Rs. 5,000 is not refundable (NB. An **applicant** is a registered customer whereas a **job seeker** is an unregistered customer). The maximum waiting period of an applicant is four months. If the agency fails to find the applicant a job before that, applicant can ask for a full refund.

The telephone operator can use the Call Centre module to keep track of telephone calls with job seekers. During the call the telephone operator can fill the basic information of the job seeker. The agency can follow up with job seekers with the help of that information. A job seeker may call the agency many times and the call details are kept with the date in the Call Centre module.

The system keeps information about applicant's dislike-countries including applicant photo, expecting job titles, language proficiency, number of children less than 5 years, expected salary and passport.

Some applicants are introduced to the Agency by third parties called sub-agents. The Agency pays agreed amount of money for sub agents for each applicant after successful departure of the applicant. This computer system keeps track about sub-agents and their payments for each applicant.

The agency has signed agreements with foreign-agents and they send Job-orders. A job-order letter may contain several job categories with respective salary and contract period.

A foreign-agent may send more than one job-order. Also the same job title may be in two different Job-orders of two different foreign-agents. An applicant is assigned to a job category of a specific foreign-agent. The system keeps track of which applicant is assigned to which job order of which foreign-agent.

There are two categories of income expenditure. That is applicant related income expenditure and office expenditure (telephone bill, water bill, building rental, etc). The computer system has to keep track of both categories.

Final developed system will have the following functionalities,

- Admin portal for system management
- User login module
- System generated SMS and e-Mail notification for applicants
- Find details of applicants along with photograph by entering Reg. No., NIC No, Passport No, Phone No or Name.
- Automatic backup of the database (monthly).
- Call Centre module to follow up inquiries via phone.
- Departure data analysis for the past 12 months
- Search Job Seekers or Applicants on a given criterion.
- Below mentioned reporting facility is contained in the system
  - Monthly income expenditure summary report
  - Applicant wise settlement report
  - Foreign agent receivable report
  - Applicant application send to foreign-agent

### **What is excluded?**

- This is not a generalized Foreign Employment Agency Management System instead this is designed only for JPS Recruitment & Foreign Travel Agency.
- Job seekers are not given online registration facility because labor and semi-skilled job seekers are not that educated and they are not used to Internet.
- A payment gateway was not included because the job seeker community prefer cash or bank deposits. Also the owner is not willing to bear the cost of a payment gateway.

## 1.5 What comes next?

### **Chapter 2 – Background/Literature Review**

This chapter concentrates on the analysis stages of the project. It describes the requirements of the project in detail. The existing and proposed systems provided through appropriate structures. Also it contains a brief review of similar systems and a comparison of alternative design strategies.

### **Chapter 3 – Analysis and Design**

This chapter concentrates on the design methodology of the project. It contains application design pattern with the relevant diagrams and the data model used. The structure of the system clearly described in this chapter.

### **Chapter 4 – Evaluation**

This chapter includes the evaluation of the system. It discusses the project objective in detail whether they were satisfied or not and the details if unsatisfied. The lessons learnt by the project, achievements and failures and the problems beyond of the control. The deficiencies and the future expandable plans also discussed in this chapter.

### **Chapter 5 – Testing**

This chapter describes the system's testing procedure. As testing is the main method in quality assurance of a given system, some test plans were developed to increase the quality of the system. This chapter mainly describes these test plans and the outcome of its execution.

### **Chapter 6 – Conclusion**

This chapter evaluates the entire project with a critical appraisal of each stage. It outlines some suggestions for the benefit of developers of similar projects in the future. Those suggestions are based on the experiences and lessons learnt in developing the current project. This chapter also summarizes ultimate achievements of the whole workload of the project. Some suggestions based on the lessons learnt in developing the project are also incorporate to help developers of similar projects in the future. Suggestions for potential future expansions of the project are also included in this chapter

Next few chapters contain the main references used to get required knowledge in each stage of the system.

## **Chapter 2: Background**

## 2.1 Introduction

When developing a system, the first step is to select a software development process according to the complexity of the system. This system is not very complicated where the requirements can be clearly described and not frequently changing. Therefore, it is a wastage of time to use evolutionary or throw away prototype methods to get the requirements clarified. Further, most of the requirements are static and are not frequently changing. Therefore, agile methodologies are not very useful in such type of situation. The system cannot be modularized into sub-modules easily because of the tight coupling of functionalities. Therefore, the incremental development method cannot be applied directly to this system. Either object-oriented systems development method or structured systems development method like the waterfall model is the most suitable methodology for this project according to its requirements and nature. It was decided to use structured systems development method as the development technique.

## 2.2 Similar projects

In order to develop a feature rich web based system for managing recruitments that efficiently and effectively meets the needs of the customer, it is essential to have a proper study on the existing systems serving the same field. It is necessary to have a proper understanding of their positive as well as negative aspects. Such a study would lead to a thorough knowledge of the domain which is about to cater. It would help to understand the main areas that need more attention so as to make the system more user friendly and efficient.

Advancements in Information and Communication Technologies (ICT) has been identified and effectively used to face the challenges of business for many years by large number of organizations. Especially foreign employment type businesses, such as Greenway Agencies (Pvt) [1] Ltd and Asliya Foreign Employment Agency [2] are in the race to maximize their revenue using ICT with effective man power.

As stated above Greenway Agencies (Pvt) Ltd and Asliya Foreign Employment Agency uses similar kind of software systems. However due to their business restrictions I was unable to have a server side look on those systems. But I have found similar open source software with the desired functional requirements on the Internet. Most of Foreign Employment Agency Management Systems are parts of large HR management systems. 'OrangeHRM' [3] is one of them which is a secure and reliable on-demand SAAS

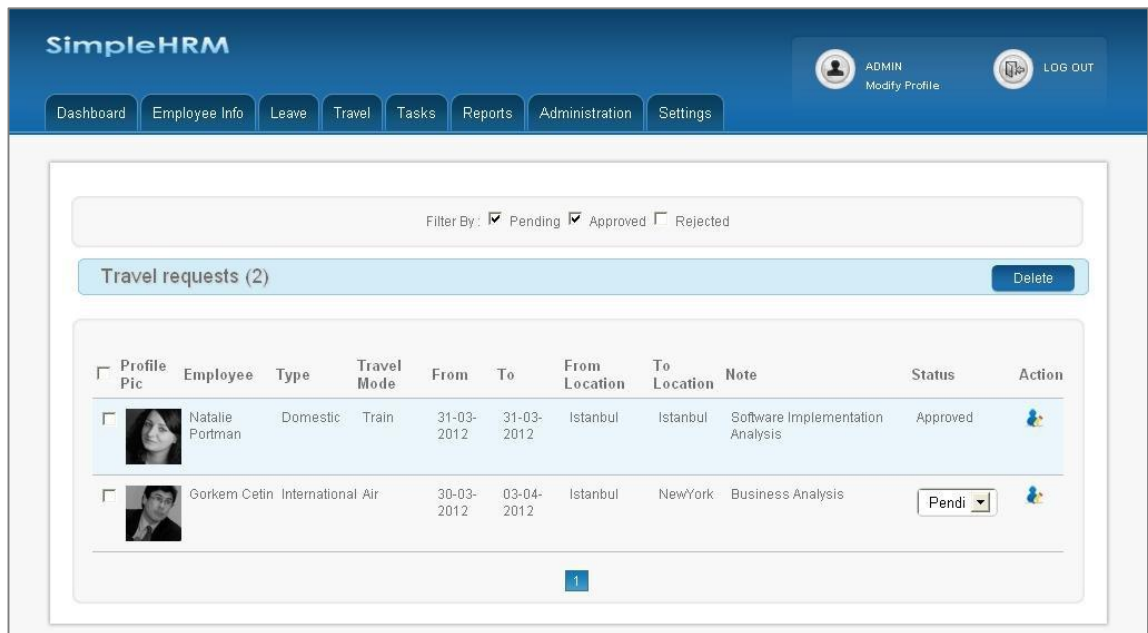
(Software as a Service) solution for recruitments management. It contains the key features like Report Generation, Custom Reports, Social Networks Integration, Applicant Documents Upload, Applicant Tracking, Applicant Information Management, User Management and ability to send bulk or individual personalized SMS or email messages to candidates. According to their introduction, scope of OrangeHRM seems to be wider than the proposed solution. Most of those features are actually out of the scope when it comes to the proposed domain but sending sms/email facility is useful for bulk interviews as well as for the individual personnel interviews.

## OrangeHRM

The screenshot displays the OrangeHRM web application interface. At the top left is the logo for 'orangeHRM OPEN SOURCE HR MANAGEMENT'. On the top right, there are links for 'Help & Training' and 'Join OrangeHRM', along with a user greeting 'Welcome Admin'. Below the header is a navigation menu with tabs for 'Admin', 'PIM', 'Leave', 'Time', 'Recruitment', and 'Performance'. A secondary menu below that includes 'Configuration', 'Employee List', 'Add Employee', and 'Reports'. The main content area shows the profile for 'John Smith'. On the left is a placeholder for a profile picture. To the right is the 'Personal Details' form, which includes fields for 'Full Name' (split into First Name: 'John', Middle Name, and Last Name: 'Smith'), 'Employee Id' (0001), 'Other Id', 'Driver's License Number', 'License Expiry Date' (format: yyyy-mm-dd), 'Gender' (radio buttons for Male and Female), 'Marital Status' (dropdown menu), 'Nationality' (dropdown menu), and 'Date of Birth' (format: yyyy-mm-dd). A green 'Edit' button is located below the form. At the bottom of the form area is an 'Attachments' section with a green 'Add' button. A vertical sidebar on the left side of the main content area lists various modules: 'Personal Details', 'Contact Details', 'Emergency Contacts', 'Dependents', 'Immigration', 'Job', 'Salary', and 'Report-to', with 'Personal Details' currently selected.

OrangeHRM has two versions, one is a paid SaaS version and the other is open source hr software. Open source version offers less functionality as compared to the paid one. The free version offers a comprehensive personal information module, organizational structure, employee self-service, time and attendance module, leave management and recruitment management system. Its interface is extremely user friendly. Another good thing about orangeHRM is the option to download it as an exe file in order to install it on a single pc without worrying about configuring backend php services or other technical stuff. It also does not offer payroll module. Another important thing missing in orangeHRM is its ability to export reports into excel formats.

## SimpleHRM



SimpleHRM [4] offers both paid and open source versions. The open source version of SimpleHRM has limited functionality in each of its modules. It does not offer travel, compliance and expense reimbursement modules. Open source version of this free hr software is pretty basic and is suitable for small organizations. The modules this open source employee management system offers is limited to employee self-service (ESS), employee information management, user access management, basic leave management and daily task reporting. The biggest thing missing in this web application is performance appraisal module. It's interface is pretty user friendly. Installation guide and user manual can easily be downloaded from SimpleHRM website.

### Alternative design strategies

Function/Feature	OrangeHRM	SimpleHRM	Proposed System
Activate / Deactivate Modules	No	No	No
Dashboard Customization	No	No	No
Exporting Reports	No	No	No
Custom Reports	Yes	No	No
Social Networks Integration	Yes	No	No
Applicant Documents Upload	Yes	No	Yes
Applicant Tracking	Yes	No	Yes
Responsive Web Application	Yes	No	Yes
Telephone Conversation Log	No	No	Yes
Travel & Expense Management	No	Yes	Yes
User Management	Yes	Yes	Yes
Applicant Information Management	Yes	Yes	Yes
Report Generation	Yes	Yes	Yes
Web-Client	Yes	Yes	Yes

## 2.3 Requirement Analysis

The requirement analysis stage is the first as well as one of the most important stage in software engineering since the new system has to be based on the requirements that have been identified at this stage. Therefore, quite a lot of care has to be exercised in order to ensure the accuracy of the outcome of this stage. The existing system should be studied initially. Several methods can be used for this, such as interviewing the employees, studying current operations and inspecting existing documents.

Since the Agency has a flat architecture, it is thought that interviewing relevant staff would be handy in requirement gathering and understanding the current problems. It helped to have a clear idea of the recruitment process and functionalities of particular users associating with the manual process. Other than interviewing employees, referencing existing documents related to recruitment process would also be useable to widen the knowledge about the domain going to be catered.

## 2.4 Functional and non-functional requirements of the system

### Functional requirements

- Manage user accounts by administrator
- User login facility
- Obtain relevant reports
- Send SMS/E-mail to jobseekers and applicants
- View, edit and save applications
- Search job seeker/applicant details in many ways

### Nonfunctional requirements

- Efficiency
- User friendliness
- Understandability
- Learnability
- Security
- Less paper work
- Robustness
- Integrity
- availability



## **Chapter 3: Analysis and Design**

## **3.1 Introduction to Analysis**

Analysis is the most significant part of software development life cycle. It will help developers to get a clear idea about the problem domain and also to find out user requirements before start developing the new system.

This chapter explains the ways of requirement gathering, analyzing and management techniques of the system. Also discusses about functional and non-functional requirements of the proposed system, what is the best method to develop the system, what technologies have to be used and what tools are required to develop the system.

## **3.2 Requirement gathering**

Purpose of every system is to fulfil the needs of the user. Those needs are named as requirements of the system. Requirement gathering is an essential activity in any kind of system development. Requirement gathering can be done by following various techniques such as,

### **3.2.1 Background reading (Inspection of existing documents)**

Evaluating reports and documentation of the present manual system will assist to get a good understanding about the background of the business.

### **3.2.2 Interviewing**

It is necessary to understand the perspective of every staff member, in order to properly address and weigh their ideas. This technique can be used to collect information from groups or individuals. Initially individual staff members are interviewed and later conducted group interviews to clarify doubts.

Also an interview may be carried out structured or unstructured according to the situation. Unstructured interviews are carried out only having a general goal or subject in mind and the questions may vary from individual to the other.

Structured Interviews are carried out with a predefined set of questions which are asked from every interviewee.

Interviews helped to gain valuable ideas about the usability of the system and the current difficulties with the existing system.

### **3.2.3 Observation**

By watching users and their normal work flow carrying out their operations to learn about the system. Observation can either be passive or active. Passive observation provides better feedback to refine requirements on the other hand active observation works best for obtaining an understanding over an existing business process such as customer registration and customer document handling. Observation is useful to validate the collected data. Had few problems with this technique because some users did not like being observed and some behaved differently while observing.

## **3.3 Requirement analysis**

The gathered requirements should be analyzed and must be checked for ambiguities to be solved. And also requirements should be cleared – out, otherwise it will lead the system to a problematic stage later

### **3.3.1 User management module**

In this system there are two types of users who access the system, Owner and Employee. Privileges granted are different for each user type.

### **3.3.2 System configuration module**

This module is handled by the owner which facilitates,

- Add or remove user access.
- Maintain country list to use in the system.
- Add or remove payment categories which can be used in the system.

### **3.3.3 Applicant registration module**

Basic details and register them using this module and maintain their basic details. A customer can register in the system only once. Using the National Identity Card number (NIC) of the customer, prevents the same customer registering more than once in the system.

### **3.3.4 Applicant search module**

Staff members need to search registered customers and access their details. Provide facility to search using registration number (issued by office), National Identity Card Number or customer name.

### **3.3.5 Passport module**

After a customer is registered, staff member will collect the passport and keep it in safe. When some customers don't have passports, staff members will guide them and help them to make their passport and collect them after they are made. Sometimes it is hard to find a passport quickly because a staff member could have taken the passports to proceed with, but sometimes passports are being misplaced because of a staff member's carelessness. So it is need to record to which staff member the passports were handed over and also whether the customer took back the passport with him/her.

### **3.3.6 Payment module**

Applicants will do the payments related to them and sometimes company will pay money for applicants to proceed with their needs. Each of those payments must be recorded in this system.

### **3.3.7 Job order management module**

Foreign agents are sending job orders to the Agency. Those job orders need to be recorded in the system and system should generate related documents to job orders when getting approvals or renewals from Sri Lankan Bureau of Foreign Employment (SLBFE). When job orders are going to expire system should notify in advance.

### **3.3.8 Call management module**

Normally the company is receiving call from job seekers who are willing to go abroad. Those calls details need to be recorded for future use.

### **3.3.9 Management information module**

The owner need information to make future decisions. He may need to know expenses, monthly registration progress and applications to processed.

## **3.4 Design & development methodologies**

### **3.4.1 Waterfall Model**

This is a sequential approach in system design. This method is well structured and has well identified steps in applying. All of those steps have very clear start and ending points. To use this, requirements should be clear and well identified. Requirement Specification, System Analysis, Design, Development, Testing and Maintenance are the basic steps of waterfall methodology

### **3.4.2 Prototyping Model**

In the prototyping, developer will develop a prototype for the requirement and it will present to the user. Then user will feedback on prototype and if user ask for modification, then again developers will develop a prototype with those changes. This will be repeated until the end of final requirement has come.

### **3.4.3 Rapid Application Development Model (RAD)**

RAD is a method that can produce a system in very short period. This has many sub components such as business modeling, data modeling, process modeling, application generation, testing and turnover. If a good software team is available and requirements are clear and period is short, this will be the method to use.

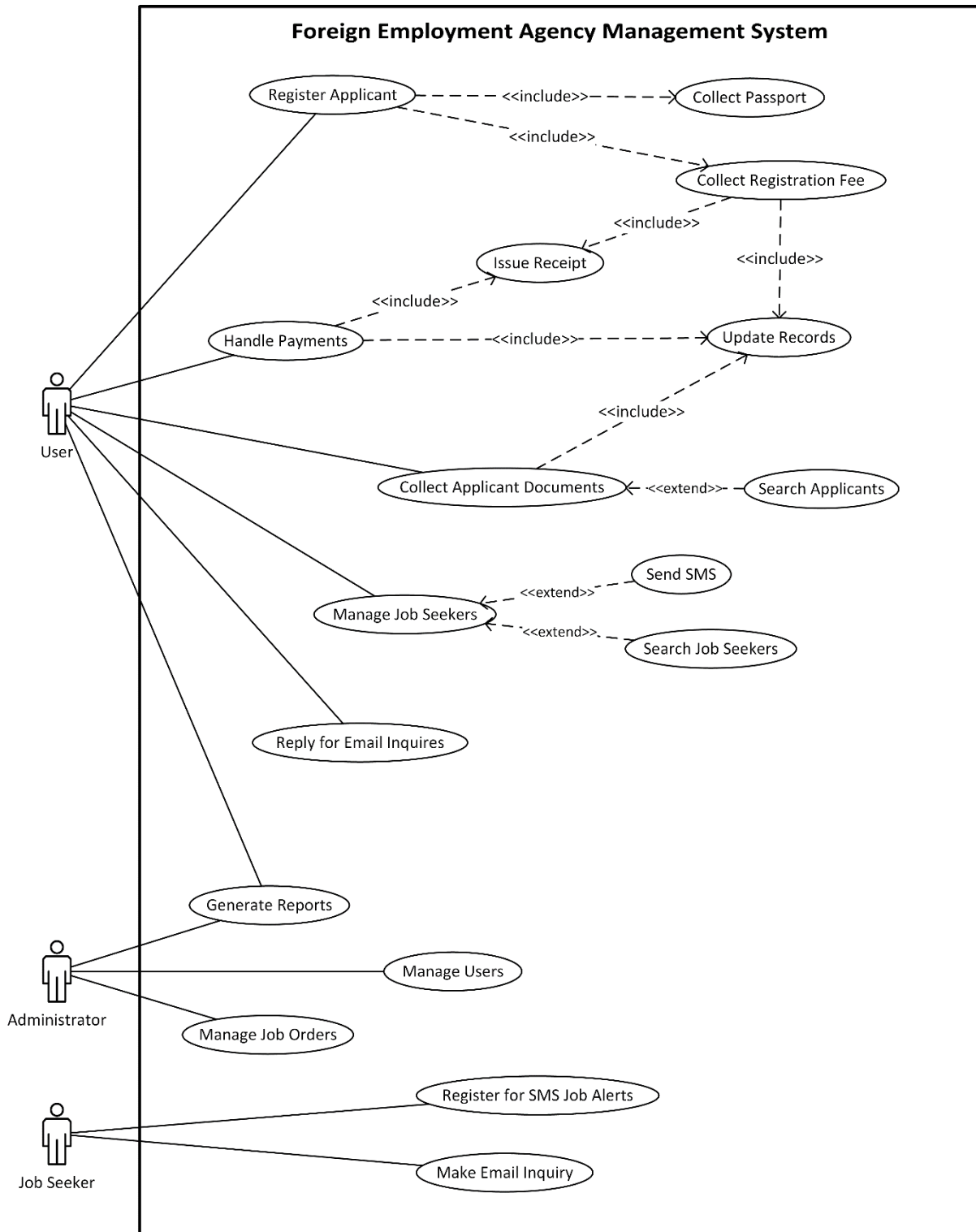
### **3.4.4 Incremental Development**

The incremental development model involves developing the system in an incremental fashion. Specialty of this methodology is, most important part of the system is first delivered and then the other parts of the system will have delivered according to their importance.

For this system implementation, iterative development methodology known as Rational Unified process (RUP) is the best choice. Because foreign recruitment handling system has higher risk of requirement changing through the project duration. So it is needed to use an iterative development methodology.

### 3.5 Use Case diagram

A use case diagram is used to describe a set of actions (use cases) that a system should or can perform in collaboration with one or more external users of the system (actors). Each use case should provide some observable and valuable result to the actors of the system. [5] **Figure 3.1** shows the high level use case diagram of the proposed system.



**Figure 3.1:** High level Use Case diagram

### 3.5.1 Use Case Narratives

#### 3.5.1.1 Use case narrative for Register Applicant

Use Case ID	01
Use Case Name	Register Applicant
Actors	User
Description	Register an Applicant
Preconditions	User has already logged into the system with a valid user account.
Normal Scenario	<ol style="list-style-type: none"> <li>1. User clicks “Add New” applicant link.</li> <li>2. Fill in the necessary event details.</li> <li>3. User saves the information for the changes.</li> </ol>
Alternate Scenario	Show error message when invalid applicant details are provided.
Post Conditions	<p>Event has been successfully published.</p> <p>Other users can see the change online.</p>

**Table 3.1:** Use case narrative for Register Applicant

#### 3.5.1.2 Use case narrative for Make Email Inquiry

Use Case ID	02
Use Case Name	Make Email Inquiry
Actors	Job Seeker
Description	Email Inquiry made by a Job Seeker
Preconditions	Visit the Agency web site via the correct URL.
Normal Scenario	<ol style="list-style-type: none"> <li>1. Fill in the necessary event details.</li> <li>2. Submit the information by clicking “Submit” button.</li> </ol>
Alternate Scenario	Show error message when an invalid email address was provided.
Post Conditions	<ol style="list-style-type: none"> <li>1. Event has been successfully completed.</li> <li>2. An email has been sent to the Agency email account with details provided.</li> </ol>

**Table 3.2:** Use case narrative for Register Applicant

### 3.5.1.3 Use case narrative for Register for SMS Job Alerts

Use Case ID	03
Use Case Name	Register for SMS Job Alerts.
Actors	Job Seeker
Description	Job Seekers can register for SMS Job Alerts
Preconditions	Visit the Agency web site via the correct URL.
Normal Scenario	<ol style="list-style-type: none"> <li>1. Click on “Subscribe for SMS Job Alerts” link.</li> <li>2. Fill in the necessary event details.</li> <li>3. Submit the information by clicking “Submit” button.</li> </ol>
Alternate Scenario	Show error message when an invalid details are provided.
Post Conditions	<ol style="list-style-type: none"> <li>1. Event has been successfully completed.</li> <li>2. Job Seeker will receive latest job alerts via SMS.</li> </ol>

**Table 3.3:** Use case narrative for Register for SMS Job Alerts

### 3.5.1.4 Use case narrative for Manage Users

Use Case ID	04
Use Case Name	Manage Users
Actors	Administrator
Description	Administrator can create new users and edit user privileges.
Preconditions	User has logged into the system with administrator privileges.
Normal Scenario	<ol style="list-style-type: none"> <li>1. Click on “System Users” link followed by “Add New” link.</li> <li>2. Fill in the required details.</li> <li>3. Click on “Add System User” button to save changes made.</li> <li>4. Click on “System Users” link followed by “View All” link.</li> <li>5. Click on “Edit” link.</li> <li>6. Make changes as needed.</li> <li>7. Click on “Update System User” button to save changes</li> </ol>
Alternate Scenario	Show error message when an invalid details are provided.
Post Conditions	<ol style="list-style-type: none"> <li>1. Event has been successfully completed.</li> <li>2. User can login to the system with granted permission.</li> </ol>

**Table 3.4:** Use case narrative for Manage Users



**3.5.1.5 Use case narrative for Generate Reports**

Use Case ID	05
Use Case Name	Generate Reports
Actors	Administrator, User
Description	Generate PDF Reports
Preconditions	Login to the system as a User or an Administrator
Normal Scenario	<ol style="list-style-type: none"> <li>1. Click on “Reports” link and select the relevant report.</li> <li>2. Fill in the necessary details.</li> <li>3. Click on “Generate Report” button.</li> </ol>
Alternate Scenario	Show error message when invalid details are provided.
Post Conditions	<ol style="list-style-type: none"> <li>1. Event has been successfully completed.</li> <li>2. Print the report.</li> </ol>

**Table 3.5:** Use case narrative for Generate Reports**3.5.1.6 Use case narrative for Search Applicants**

Use Case ID	06
Use Case Name	Search Applicants
Actors	Administrator, User
Description	Administrator or User can search users giving the search criteria.
Preconditions	User has to log into the system.
Normal Scenario	<ol style="list-style-type: none"> <li>1. Click on “Applicants” link followed by “Search” link.</li> <li>2. Fill in the required details.</li> <li>3. Click on “Search” button.</li> <li>4. The records satisfying the search criteria are listed down.</li> </ol>
Alternate Scenario	Show error message when invalid details are provided.
Post Conditions	<ol style="list-style-type: none"> <li>1. Event has been successfully completed.</li> </ol>

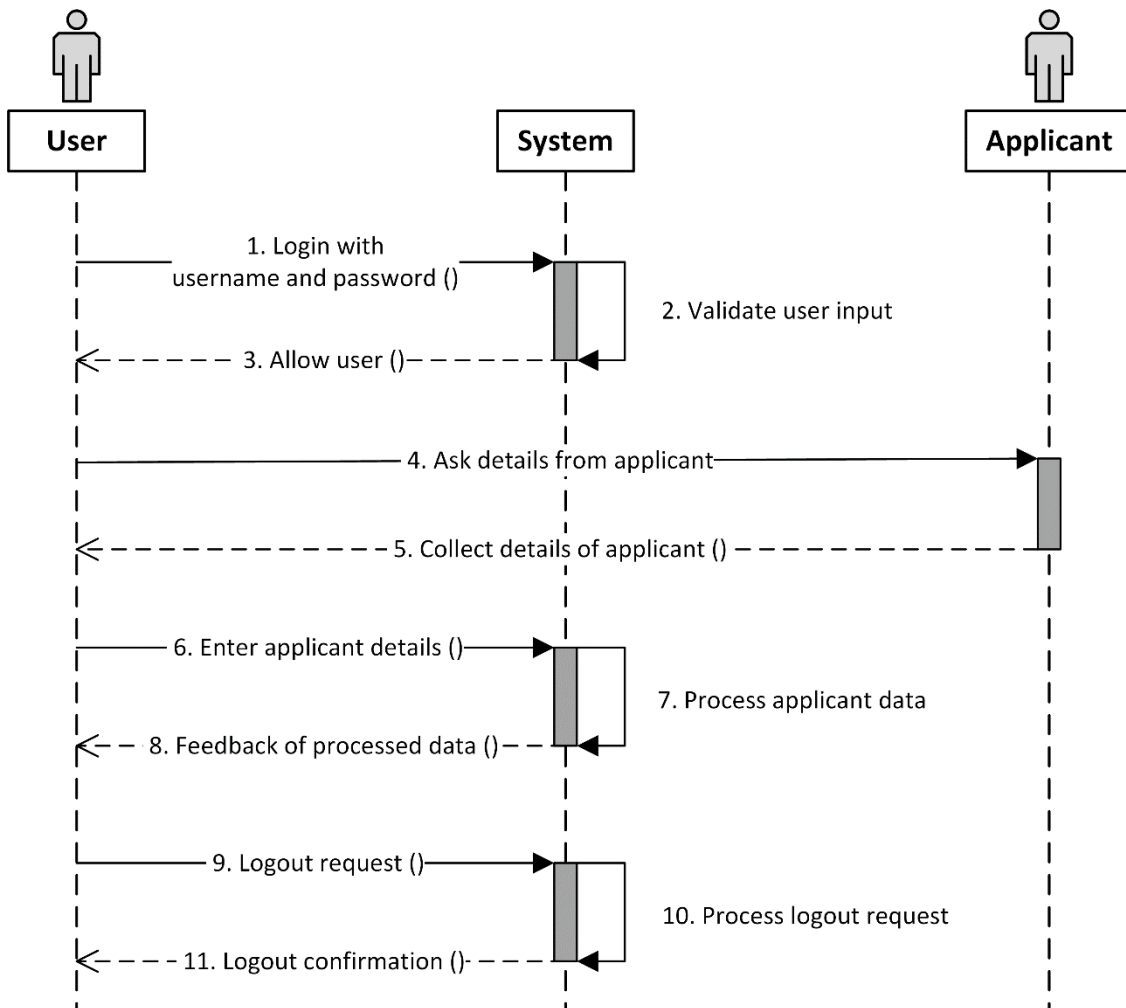
**Table 3.6:** Use case narrative for Search Applicant**3.5.1.7 Use case narrative for Reply for Email Inquiries**

Use Case ID	07
Use Case Name	Reply for Email Inquiries
Actors	Administrator, User
Description	Administrator or User can log in to the mail account and reply.
Preconditions	User has to log into the mail account.
Normal Scenario	<ol style="list-style-type: none"> <li>1. Click on “Inbox” link.</li> <li>2. Vies received emails from job seekers.</li> <li>3. Reply to individual emails separately as needed.</li> </ol>
Alternate Scenario	Delete spam emails.
Post Conditions	<ol style="list-style-type: none"> <li>1. Event has been successfully completed.</li> </ol>

**Table 3.7:** Use case narrative for Reply for Email Inquiries

### 3.6 Sequence diagrams

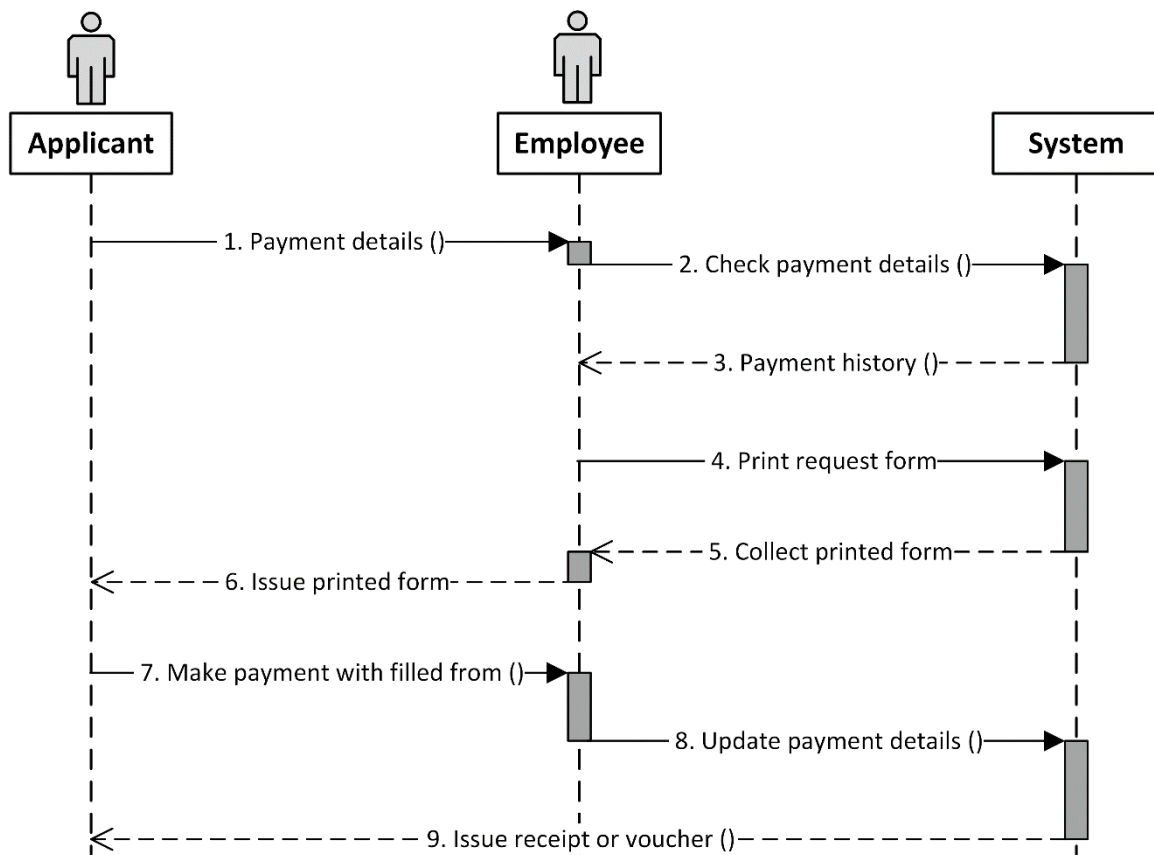
#### 3.6.1 Sequence diagram for applicant registration



**Figure 3.2:** Sequence diagram for applicant registration

Above **Figure 3.2** explains the steps followed by an employee during applicant registration process.

### 3.6.2 Sequence diagram for applicant payment



**Figure 3.3:** Sequence diagram for applicant payment

Above **Figure 3.3** explains the steps followed by an employee during applicant payment process.

### 3.7 Class Diagram

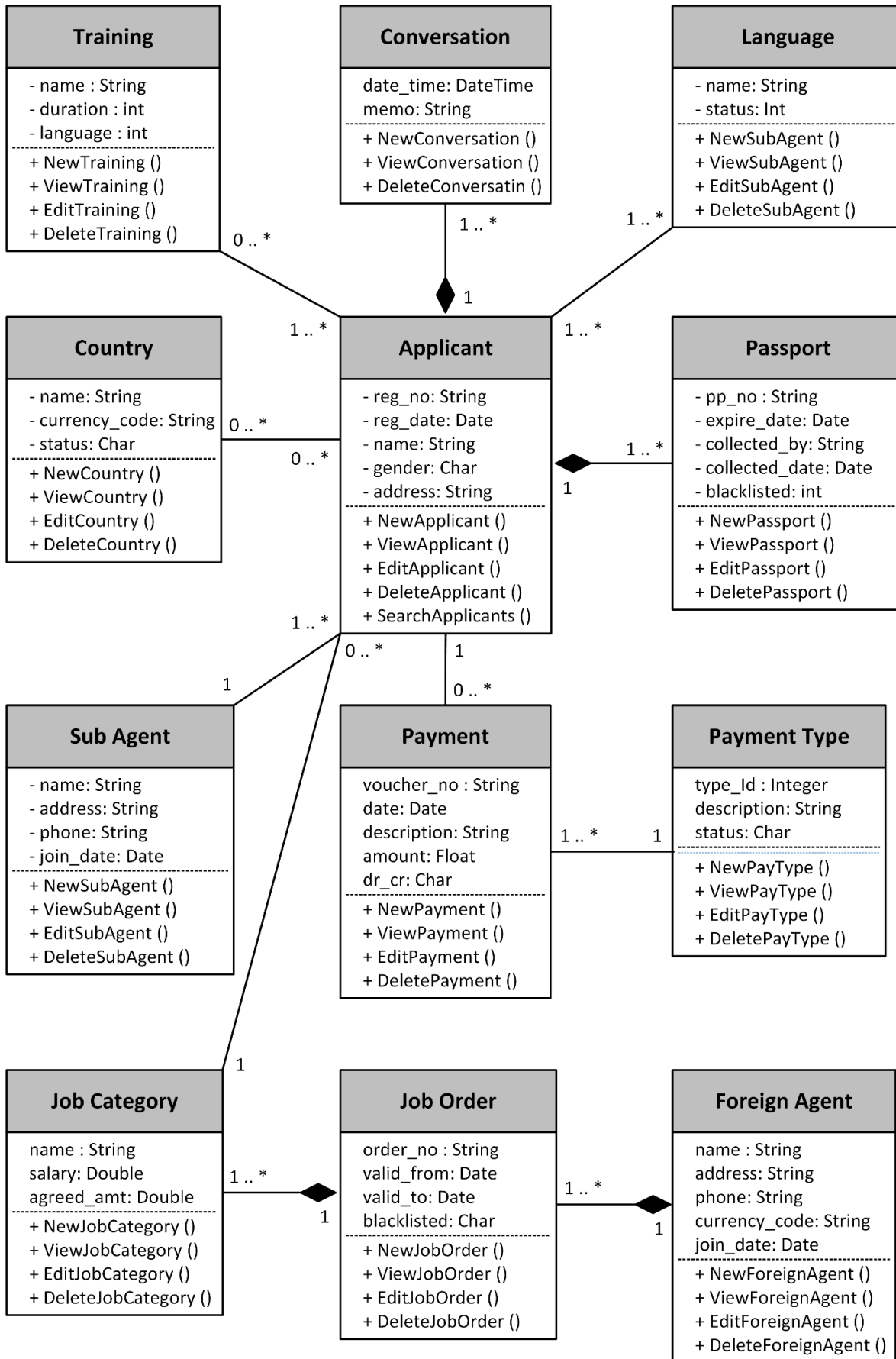


Figure 3.4: Class Diagram

### 3.8 ER Diagram

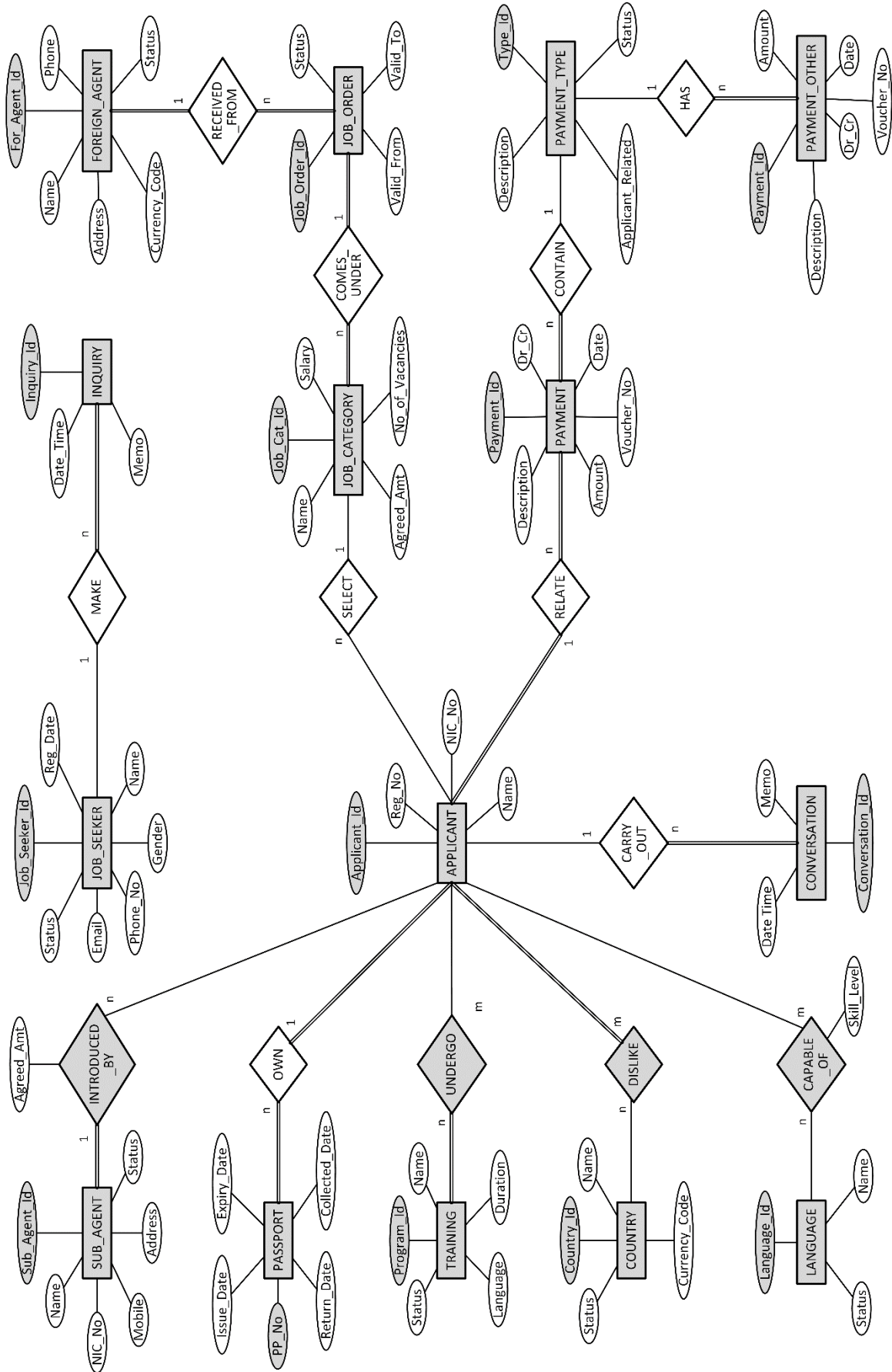
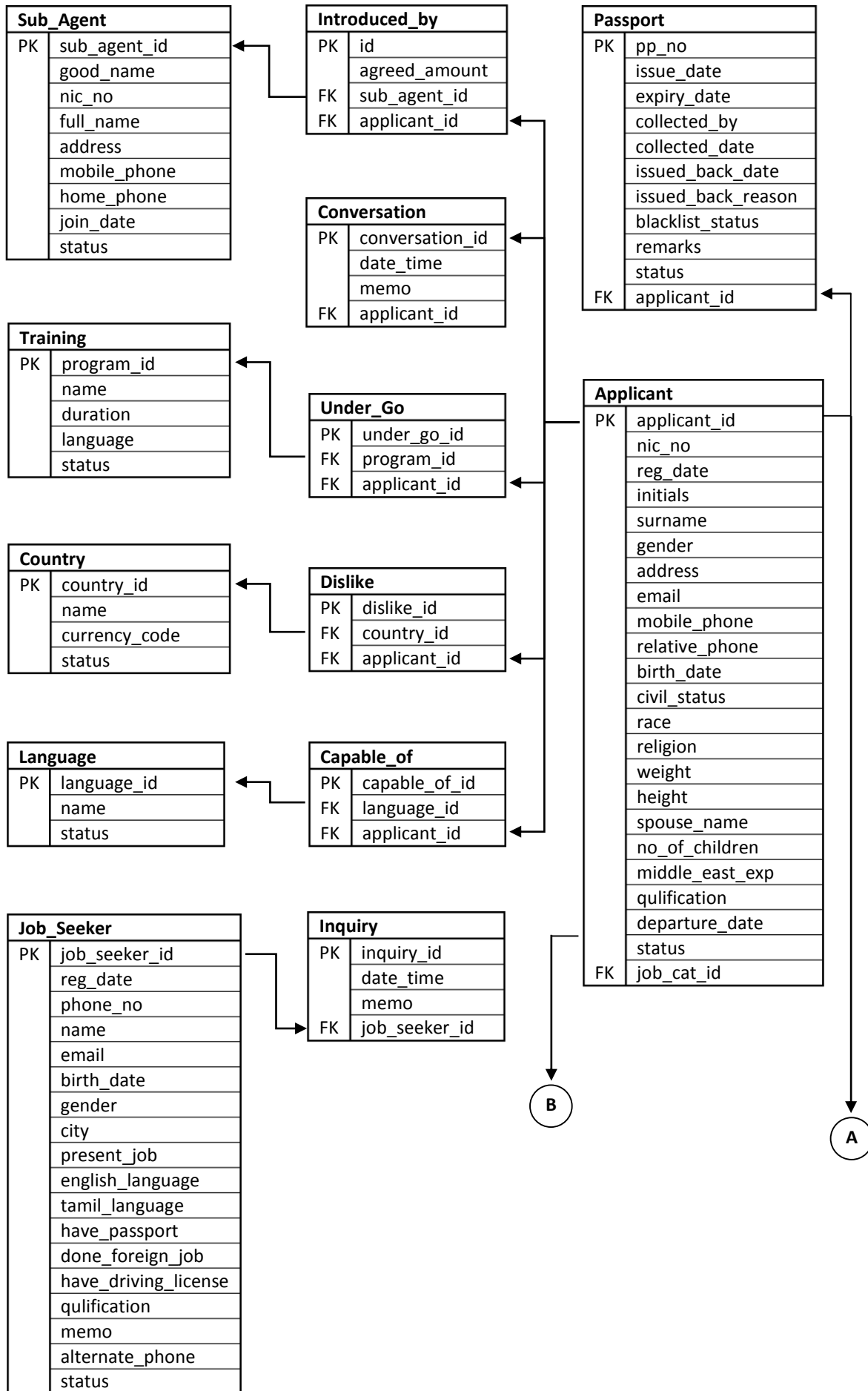


Figure 3.5: ER Diagram for the proposed system

### 3.9 Database Diagram



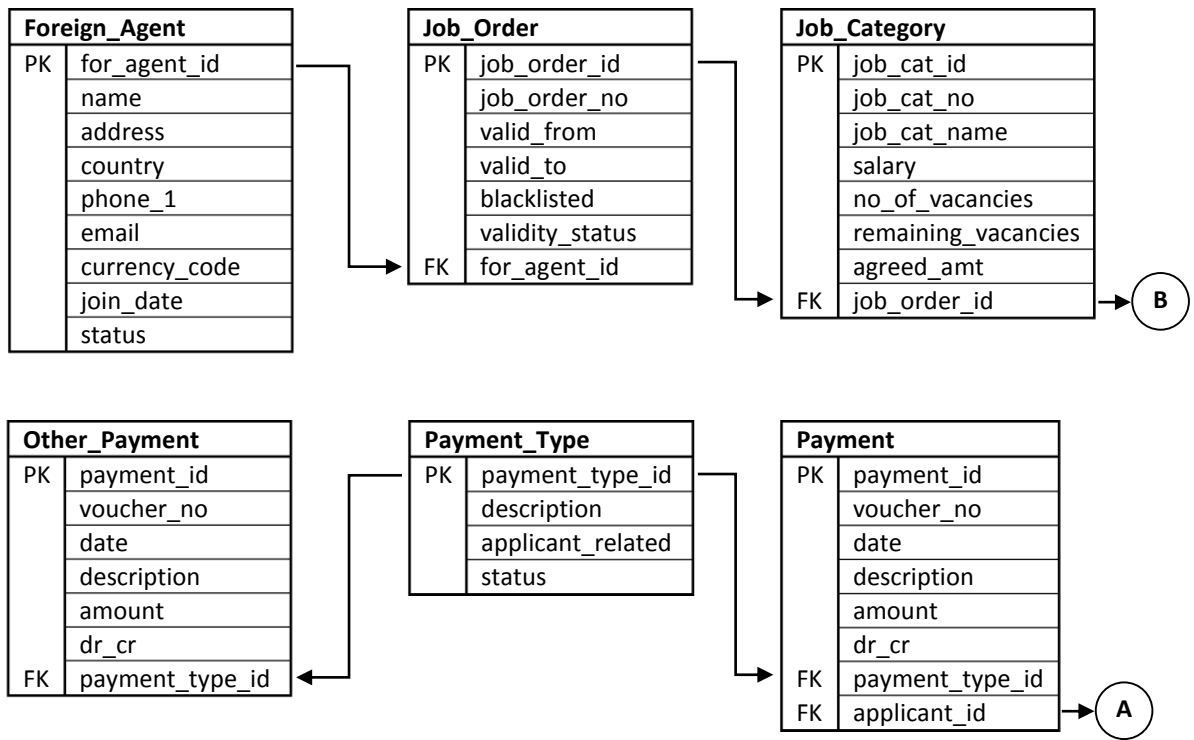


Figure 3.6: Database diagram for the proposed system

### 3.10 Physical Design

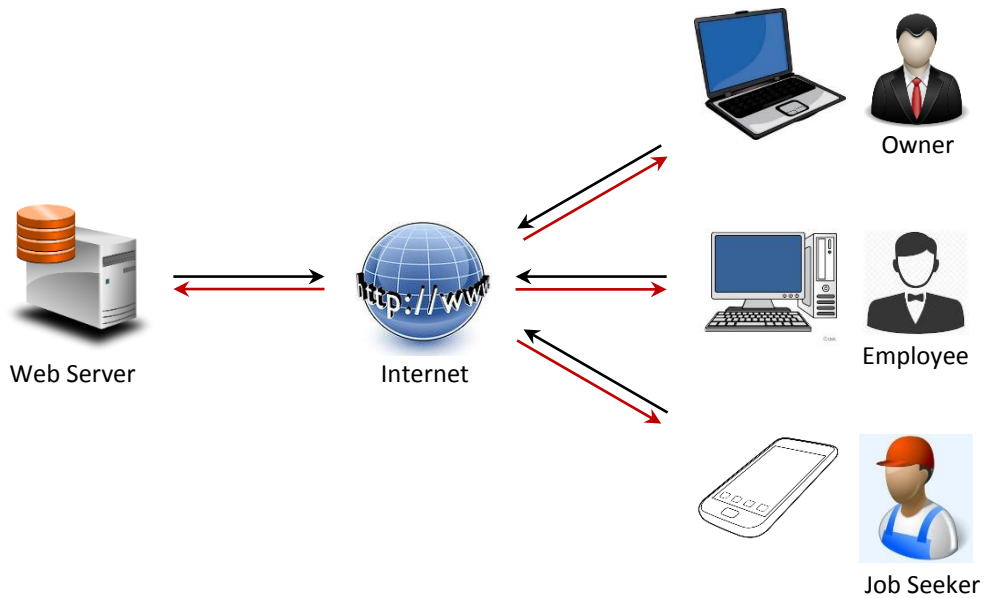


Figure 3.7: Physical design of the proposed system

## **Chapter 4: Implementation**



## 4.1 Introduction

Implementation phase is where actual development of the project begins. During this phase conceptual models produced during design phase is transformed to actual code. This chapter documents the work carried out during implementation phase of this project.

## 4.2 Hardware and Software Requirements

### 4.2.1 Software Requirements

#### **For Server**

The new system was hosted on LankaHost server with CloudLinux operating system having Apache server v2.4, PHP v5.5, MySQL v5.6 and which has Mobile Access support for Android, iPhone and Windows Mobile.

#### **For Job Seekers**

A personal computer with Microsoft Windows 7 or higher version having either Mozilla Firefox, Google Chrome or Internet Explorer 8.0 or higher web browser. Android or iOS mobile phone with Mozilla Firefox or Google Chrome web browser.

#### **For Employees**

A personal computer with Microsoft Windows 7 or higher version having either Mozilla Firefox, Google Chrome or Internet Explorer 8.0 or higher web browser.

### 4.2.2 Hardware Requirements

#### **For Server**

Disk Space      2 GB

Bandwidth      100 GB 1 Gbps dedicated

#### **For Employees**

A personal computer with any quad-core processor with 2 GB of RAM and 100 GB of available hard disk space having and Internet access.

#### **For Job Seekers**

A personal computer with any dual-core processor with 1 GB of RAM and 30 GB of available hard disk space or a smartphone having Internet access.

## 4.3 Installation Procedure

The system was developed and tested on a laptop computer running Windows 7 and XAMPP local server. In order for the Web application to be accessible via the Internet, it has to be installed on a Web Server running Apache, PHP and MySQL.

### 4.3.1 Server Installation

Since my development was based on PHP and MySQL technologies both Linux and Windows servers will support. But in contrast Linux hosting is cheaper than Windows hosting solutions due to the expensive license fee of the Windows operating system. Also Linux server stability and security is truly superior to that of Windows. Hence it is decided to choose Linux hosting over Windows.

The domain name [www.jpsagency.lk](http://www.jpsagency.lk) have been chosen and registered in order for the web application to be accessed via a URL.

### 4.3.2 Client Installation

Since this is a web application, there is no need for a specific installation or deployment method. Internal users can access the system via the URL <http://www.jpsagency.lk>. It is tested on Google Chrome, Mozilla Firefox and Internet Explorer v8 and above web browsers. Mozilla Firefox and Google Chrome web browsers are free to download and use, where as Microsoft Internet Explorer is readily available with Windows operating system. It is recommended to use Google Chrome on Windows 7 or newer. Since this system was designed and implemented by considering the portability as well, it runs on Linux environments too. It is tested on Linux Mint v18 with Mozilla Firefox.

Since the client had his own computers with Core i5 processors running windows 7 operating system and other applications, the only application software installed was Google Chrome which is free to download from <https://www.google.com/chrome>.

## 4.4 Development Tools

### 4.4.1 Sublime Text v3

Sublime Text is a proprietary cross-platform source code editor which supports many programming languages including PHP. Additional functionality can be easily added by community-built plugins [5]. Why I like Sublime Text most is it has a dark background which reduces eyestrain and increase the amount of contrast with the text. Another favorite feature of SublimeText is the full project search which opens a new tab where I can see my search term as well as the surrounding text. Multi-select editing feature with copy-paste support allows me to place more than one cursor in text, which facilitate simultaneous editing. Also Sublime Text has a huge following of users with hundreds of questions each month on StackOverflow, countless blog posts on any feature and recommended packages.

Installed and tested the text editors PhpStorm v2017, NetBeans IDE v8.2 and Sublime Text v3 and selected Sublime Text v3 as the text editor because it is a light weight application with amazing text editing keyboard shortcuts.

### 4.4.2 CodeIgniter Framework v3

The leading open source PHP frameworks in the market are CodeIgniter and Larawell. If we just compare the two frameworks side by side, only about the features that they have Larawell will be the winner. But I am more familiar with CodeIgniter because it was taught during Rapid Application Development subject. No configurations are required for CodeIgniter, just download copy and paste use. Also lot of support is available on the web than Larawell. If I choose Larawell I have to learn it from the beginning, which may consume considerable amount of time. It is not to choose the best framework but it is rather to choose the best framework that fits me. Since I am a beginner and I have to start fast as possible I have selected CodeIngiter framework.

CodeIgniter is a free, open-source, easy-to-use, object-oriented PHP web application framework, providing a ready-to-use library to use with PHP applications. There is a Database API to make it easier and more convenient to execute SQL queries, such as SELECT, UPDATE, DELETE, INSERT, etc.,

without having to create a lot of repetitive code. Also it has a very extensive user guide, which is much better than documentation on other frameworks. CodeIgniter primarily uses the Model, View, Controller (MVC) approach to application design and development. It essentially separates application logic from the application design/view. The application logic is the Controller, whereas the application design/view is the View. The Model is for database interactions. [6]

### **4.4.3 PHP v5.5**

PHP is a platform independent server-side web programming language that is widely used for web development. There are many languages which are used for web development or web programming, but among all of them PHP is the most popular web scripting language since it is cheap, secure, fast and reliable.

### **4.4.4 XAMPP**

XAMPP is a free and open source cross-platform web server solution package. XAMPP stands for Cross-Platform (X), Apache (A), MariaDB (M), PHP (P) and Perl (P). It is a simple, lightweight Apache distribution that makes it extremely easy for developers to create a local web server for testing and deployment purposes. The website works exactly the same way as with the web host. Since most actual web server deployments use the same components as XAMPP, it makes transitioning from a local test server to a live server extremely easy as well [7].

### **4.4.5 Navicat**

Navicat is a cross-platform graphical database management and development software. It is straightforward and easy to use when compared to phpMyAdmin. It has an Explorer-like graphical user interface and supports multiple database connections for local and remote databases. The features I like most are Import/Export Wizard, Report Builder and Data Modeling.

#### **4.4.6 jQuery v2**

jQuery is a cross-platform JavaScript library designed to simplify the client-side scripting of HTML. It is a free, open-source, fast, small, feature-rich and widely used. The purpose of jQuery is to make it much easier to use JavaScript on my application. jQuery takes a lot of common tasks that require many lines of JavaScript code to accomplish, and wraps them into methods that I can call with a single line of code. In simple terms jQuery is a lightweight, "write less, do more", JavaScript library [8].

#### **4.4.7 Bootstrap v2**

Bootstrap is a free and open-source front-end library for designing websites and web applications. It contains HTML and CSS based design templates for typography, forms, buttons, navigation and other interface components, as well as optional JavaScript extensions. Unlike many web frameworks, it concerns itself with front-end development only. Bootstrap also support creating responsive designs [9].

#### **4.4.8 HTML5**

HTML is a markup language used for structuring and presenting content on the World Wide Web. HTML5 is the fifth and current major version of the HTML standard. HTML5 was developed to solve compatibility problems that affect the current standard, HTML4. One of the biggest differences between HTML5 and previous versions of the standard is that older versions of HTML require proprietary plugins and APIs. (This is why a Web page that was built and tested in one browser may not load correctly in another browser.) HTML5 provides one common interface to make loading elements easier [10].

#### **4.4.9 MySQL v5.5**

MySQL is the most popular open-source relational database management system (RDBMS) based on Structured Query Language (SQL). SQL is the most popular language for adding, accessing and managing content in a database. MySQL is most noted for its quick processing, proven reliability, ease and flexibility of use. It is an essential part of almost every open source PHP application. Its connectivity, speed, and security make MySQL Server highly suited for accessing databases on the Internet [11].

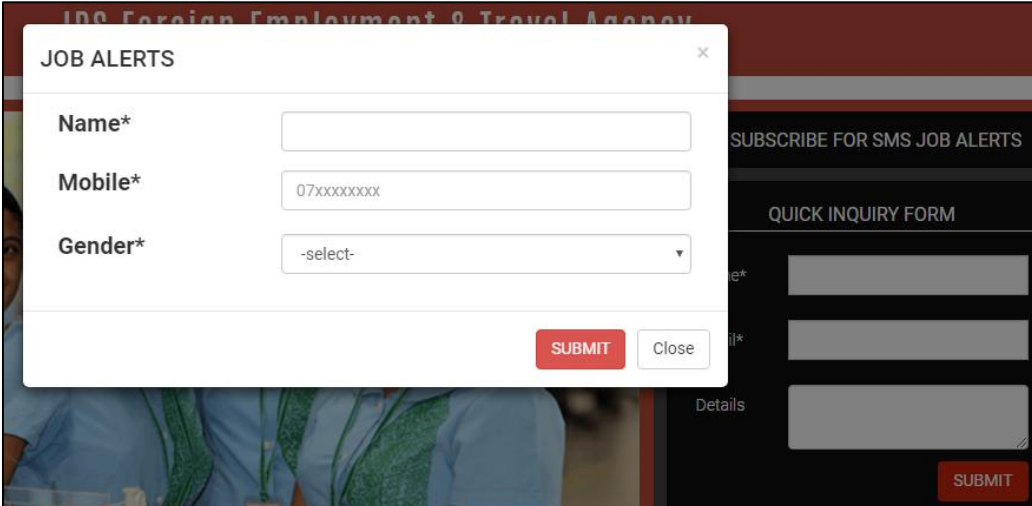
## 4.5 Methods used to enhance code quality

- **Naming Conventions** - When declaring necessary variables, meaningful names have been used for them to aid the readability of coding. Meaningful names help others to understand what has been done in coding.
- **Comments** - Comments increase the readability of coding as they describe what has been done in coding. This feature is very useful for future purposes also. Because when authorized person (except the system developed programmer) needs to handle system errors or do more modifications to the system, he has to know the existing coding. Even the programmer may forget coding which he has done after certain time period. Comments are essential in coding and very helpful for code maintenance.

## 4.6 Important user interfaces

### 4.6.1 Subscribe for SMS job alerts pop-up window

Just by visiting the home page, job seekers can register for SMS job alerts.

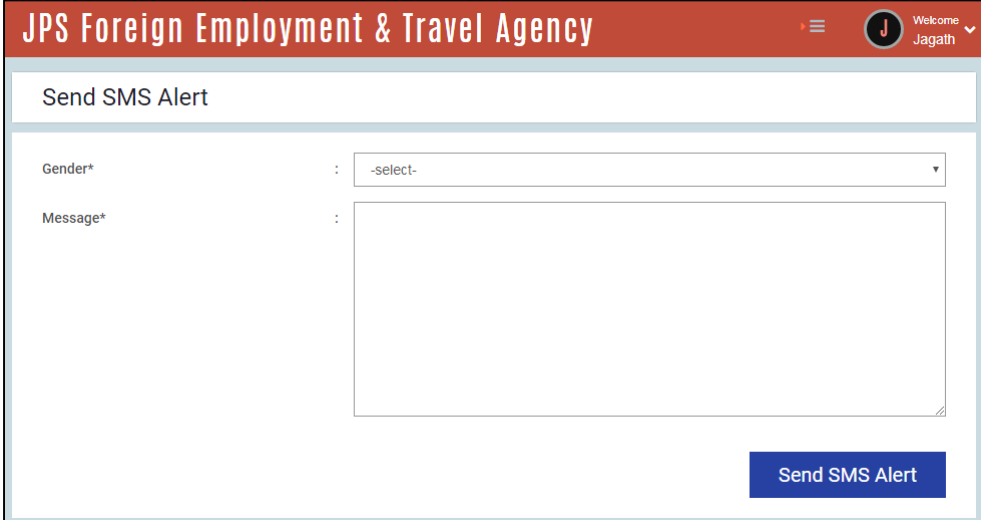


The image shows a screenshot of a web application. A white pop-up window titled "JOB ALERTS" is centered on the screen. It contains a registration form with three fields: "Name\*" (text input), "Mobile\*" (text input with placeholder "07xxxxxxxx"), and "Gender\*" (dropdown menu with "-select-"). At the bottom right of the form are two buttons: a red "SUBMIT" button and a white "Close" button. The background is a blurred view of the website's home page, showing a dark header with "SUBSCRIBE FOR SMS JOB ALERTS" and a "QUICK INQUIRY FORM" section with several input fields and a "SUBMIT" button.

**Figure 4.1:** Subscribe for SMS job alerts pop-up window

## 4.6.2 Send SMS Alert Interface

The Agency can send job alerts to the active registered job seekers when needed.

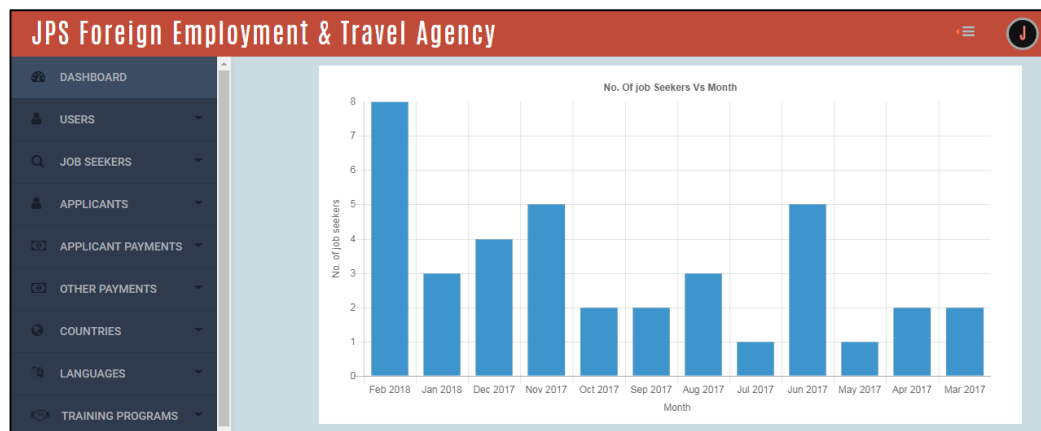


The screenshot shows the 'Send SMS Alert' interface. At the top, there is a red header with the text 'JPS Foreign Employment & Travel Agency' and a user profile icon with the text 'Welcome Jagath'. Below the header, the main content area is titled 'Send SMS Alert'. It contains two input fields: 'Gender\*' with a dropdown menu showing '-select-' and 'Message\*' with a large text area. A blue button labeled 'Send SMS Alert' is positioned at the bottom right of the form.

**Figure 4.2:** Send SMS Alert Interface

## 4.6.3 Dashboard

Shows valuable graphical information derived from database data.



**Figure 4.3:** Dashboard

#### 4.6.4 Search Job Seekers Interface

Job seekers can be search by part of name, mobile phone or gender.

The screenshot shows the 'Search Job Seeker' interface. On the left, there are search filters: Name (text input), Mobile Phone No. (text input), Gender (dropdown menu), and Status (dropdown menu). A 'Search' button is located below these filters. On the right, a table displays the search results.

Name	Mobile	Alt Phone	Email	Status
1. Udara	0773989367		udamadu@gmail.com	Inactive
2. Jagath D	0767861700		jagaths@gmail.com	Inactive
3. Jagath M	0717861700	0767861700	jagaths@gmail.com	Inactive
4. Pathirana	0775686951			Inactive
5. Nirosha	0716414294			Inactive
6. Liyanage	0717684295			Inactive
7. Hirun	0758262206			Inactive

Figure 4.4: Search Job Seekers Interface

#### 4.6.5 Search Applicants Interface

Applicants can be search by country, qualification, working experience and language ability.

The screenshot shows the 'Search Applicants' interface. On the left, there are search filters: Country (dropdown menu), Qualification (dropdown menu), Middle East Working Experience (years) (text input), and Language Ability (checkboxes for English, Tamil, Arabic, Greek, Hindi). On the right, a table displays the search results.

Name	Reg. No	Mobile No
1. Mrs. JANK Chandika	P00007	787818214
2. Ms. BSL Fernando	R00001	719145235
3. Mr. RD Gemunusiri	R00010	786022403
4. Mrs. VS Jayanthi	P00122	715303106
5. Mr. KADS Karunaratna	R00013	716566813
6. Mr. KK Kularathna	R00004	774054669
7. Mr. EAAU Kumara	R00002	723933572

Figure 4.5: Search Applicants Interface



### 4.6.6 Monthly Income Expenditure Report

Monthly Office Expenses Summary								
<b>JPS Agency</b> Address: No. 18, Mihindu Mawatha, Kurunegala. Website : <a href="http://www.jpsagency.lk/">http://www.jpsagency.lk/</a> E-mail : <a href="mailto:info@jpsagency.lk">info@jpsagency.lk</a> Phone : 037 222 0946		<table border="1"> <tr> <td>Month :</td> <td>February 2018</td> </tr> <tr> <td>Dated :</td> <td>25 Mar 2018</td> </tr> <tr> <td>Currency :</td> <td>LKR</td> </tr> </table>	Month :	February 2018	Dated :	25 Mar 2018	Currency :	LKR
Month :	February 2018							
Dated :	25 Mar 2018							
Currency :	LKR							
Sl. No.	Type	Sub Total						
1	Building Rental	39360.00						
2	Telephone Bill	7635.00						
3	Water Bill	510.00						
4	Electricity Bill	17000.00						
5	Salary	54500.00						
6	Petty Cash	0.00						
7	Postage	450.00						
8	Courier Charges	3000.00						
9	Travelling	10600.00						
10	Advertising	30000.00						
11	Decoration Expenses	525.00						
12	Treat Expenses	180.00						
13	Donation	0.00						
14	Repair Charges	0.00						
15	Stationary	355.00						
16	Other	2495.00						
Total :		166610.00						

**Figure 4.6:** Monthly Income Expenditure Report

### 4.6.7 Applicant Settlement Report

Applicant Income/Expenditure Report of Mrs. WAC Samarathilaka						
<b>JPS Agency</b> Address: No. 18, Mihindu Mawatha, Kurunegala. Website : <a href="http://www.jpsagency.lk/">http://www.jpsagency.lk/</a> E-mail : <a href="mailto:info@jpsagency.lk">info@jpsagency.lk</a> Phone : 037 222 0946		<table border="1"> <tr> <td>Dated :</td> <td>25 Mar 2018</td> </tr> <tr> <td>Currency :</td> <td>LKR</td> </tr> </table>	Dated :	25 Mar 2018	Currency :	LKR
Dated :	25 Mar 2018					
Currency :	LKR					
Sl. No.	Type	Sub Total				
<b>Income</b>						
1	Foreign Agent Payment	180500.00				
<b>Total Income :</b>		<b>240500.00</b>				
<b>Expences</b>						
1	Beuro Charges	(19500.00)				
2	Declaration Fee	(300.00)				
3	Air Ticket	(51900.00)				
4	Postage	(2500.00)				
<b>Total Expences :</b>		<b>(74200.00)</b>				
<b>Net Income :</b>		<b>166300.00</b>				

**Figure 4.7:** Applicant Settlement Report

## **Chapter 5: Testing and Evaluation**

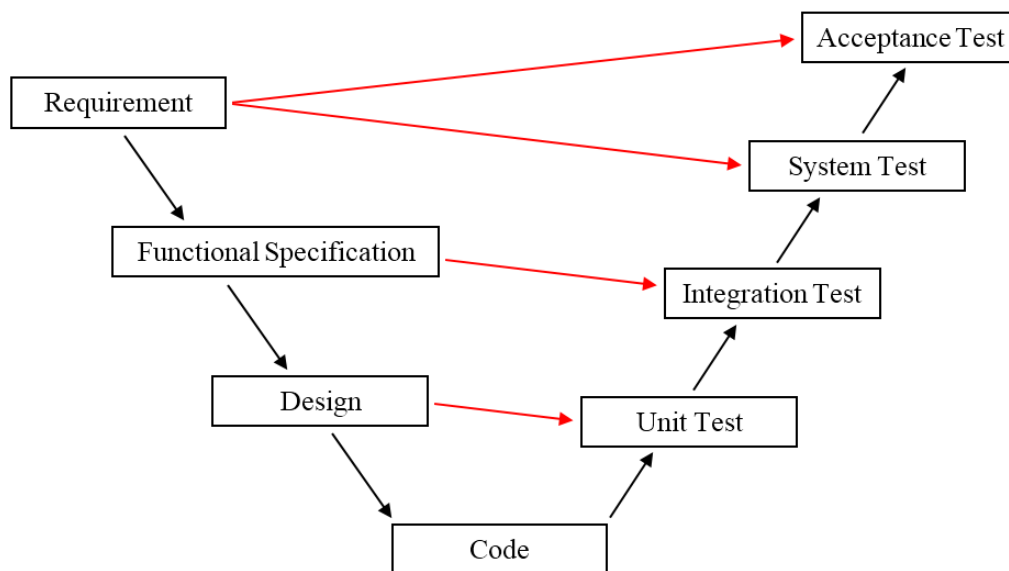
## 5.1 Testing

Software testing is a process used to identify the correctness, completeness and quality of developed computer software. It includes a set of activities conducted with the intent of finding errors in software. So that it could be corrected before the product is released to the end users. In simple words, software testing is an activity to check whether the actual results match the expected results and to ensure that the software system is defect free.

There are two approaches to software testing called static and dynamic. Static testing includes reviews, walkthroughs or inspections which is omitted in practice. Dynamic testing includes actually executing programmed code with a given set of test cases. It takes place when the program itself is used. Dynamic testing may begin before the program is 100% complete in order to test particular sections of code and are applied to discrete functions or modules.

### 5.1.1 Testing Levels

Testing can also be grouped by where they are added in the software development process, or by the level of specificity of the test. The main levels of testing during the development process can be mainly identified as unit testing, integration testing, system testing and acceptance testing. Figure 5.2 shows the testing levels in the project life cycle.



**Figure 5.1:** Testing Levels in Project Life Cycle

### **5.1.1.1 Unit Testing**

Unit testing is carried out as a part of the coding task. This phase is based on the design of the software for a piece of code. Unit testing should prove robustness, functionally correctness and correct interface of the code.

### **5.1.1.2 Integration Testing**

Integration testing is carried out after the separate software modules have been unit tested. Integration testing is based on the functional specification of the software and it should prove integration and functionally correctness of the software. There are several types of integration testing: incremental integration testing, top-down integration testing and bottom-up integration testing.

### **5.1.1.3 System Testing**

System testing is carried out at the completion of the integration testing. The purpose of system testing is to prove that the software meets the agreed user requirements and works in the target environment. System testing covers both functional and non-functional requirements. This will also include recovery, security, stress and performance tests.

### **5.1.1.4 Acceptance Testing**

Acceptance testing is carried out at the customer's site with the customer in attendance. The purpose of the acceptance test is to show to the customer that the software does indeed work. These tests are usually a sub set of the system test.

## **5.1.2 Software Testing Techniques**

Testing techniques were used to effectively design efficient test cases. These techniques can be grouped into white-box testing and black-box testing.

### **5.1.2.1 White box Testing**

White box testing tests internal structures of a program, as opposed to the functionality exposed to the end-user. The tester chooses inputs to exercise paths through the code and determine the appropriate outputs.

White box testing was done for this project that based on knowledge of the internal logic of an application's code. Tests are based on coverage of code statements, branches, paths, conditions. Using this method, test cases were derived according to the program structure.

### **5.1.2.2 Black box Testing**

Black-box testing treats the software as a "black box", examining functionality without any knowledge of internal implementation. The tester is only aware of what the software is supposed to do, not how it does it.

## **5.1.3 Used Testing Strategies**

Following were adopted for better practice of testing process of this system.

- Creating a Test Plan
- Prioritizing Tests
- Test Cases and Design

### **5.1.3.1 Creating a Test Plan**

For this system, a test plan was created explaining the outline and defined approaches taken to perform testing of the project. Test plan was developed to fulfill the following objectives:

To establish a comprehensive test plan that identifies the nature and extent of tests deemed necessary to achieve the testing objectives for the project, including software and hardware requirements.

To coordinate an orderly schedule of events, identify equipment and organizational requirements, describe test methodologies and strategies to be used and identify items to be delivered.

### **5.1.3.2 Prioritizing Tests**

Before testing was started we had to prioritize according to the importance of tests, because of the limited time. When prioritizing tests, we concentrated on the following ranking criteria:

- Test where a failure would be most severe
- Test where failures are most likely
- Ask the user to prioritize the requirements
- What is most critical to the user's business

An advantage we got by prioritizing is when we stopped testing; we have done the best testing in the time available.

### 5.1.3.3 Test Cases

Test case is a set of actions with expected results based on requirements for the system. It contains of outputs and procedures, follows when doing the testing process. There are two types of test cases as positive test case and negative test case.

- A test case includes these elements:
- The purpose of the test or description of what requirement is being tested.
- Test data - Test data is a specification of the data elements, values or set that define how to satisfy the test intent.
- The setup to test - Version of application, hardware, software, operating system, access level, logical or physical date and any other setup information being tested.
- Actions and expected results.

Following are the sample test cases which were used to run unit and integration tests.

#### Test case for Login Form

Test Case Name	Validate Login Form
Purpose	Check whether login form work correctly
Tasks	<ol style="list-style-type: none"> <li>1. submit form without user name</li> <li>2. submit form without password</li> <li>3. submit form with invalid user name</li> <li>4. submit form with wrong password</li> <li>5. submit form with correct user name &amp; password</li> </ol>
Expected Results	<ol style="list-style-type: none"> <li>1. take cursor again user name box</li> <li>2. display message” password cannot be empty</li> <li>3. display message ‘Invalid User Name’</li> <li>4. display message ‘password is incorrect’</li> <li>5. login successfully</li> </ol>
Summary	Received expected results. Displayed error messages properly.
Status	Pass

**Table 5.1:** Test case for Login Form

**Test case for add new applicant**

Test Case Name	Validate Add New Applicant Form
Purpose	Check whether Add New Applicant form works correctly
Tasks	<ol style="list-style-type: none"><li>1. submit form without filling compulsory fields.</li><li>2. submit a completed form.</li></ol>
Expected Results	<ol style="list-style-type: none"><li>1. display error message</li><li>2. allow to add new applicant details to the system.</li></ol>
Summary	Received expected results. Displayed error messages properly.
Status	Pass

**Table 5.2:** Test case for add new applicant**Test case for add new job seeker**

Test Case Name	Validate Add New Job Seeker Form
Purpose	Check whether Add New Job Seeker form works correctly
Tasks	<ol style="list-style-type: none"><li>1. submit form without filling compulsory fields.</li><li>2. submit a completed form.</li></ol>
Expected Results	<ol style="list-style-type: none"><li>1. display error message</li><li>2. allow to add new job seeker details to the system.</li></ol>
Summary	Received expected results. Displayed error messages properly.
Status	Pass

**Table 5.3:** Test case for add new job seeker



## 5.2 Evaluation

Few days after system installation, a set of user feedback forms would be distributed among a selected set of end users to get their feedback about the system. An Evaluation Form was designed to collect feedback from the end users. This was distributed among them to get their feedback anonymously. Returned feedback forms are assessed to obtain the actual feedback of the users.

There were twenty attendees for usability testing. Each individual session lasted for about 30 minutes. Two of the participants were from admin category, five of the participants were from staff member category and the remaining thirteen participants were from job seeker category.

### JPS Recruitment & Foreign Travel Agency

#### Software Evaluation Form

URL – [www.jpsagency.lk](http://www.jpsagency.lk)

Q1	Navigability through the program ?
	<input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Satisfactory <input type="checkbox"/> Good <input type="checkbox"/> Excellent
Q2	Readability of the characters on the screen ?
	<input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Satisfactory <input type="checkbox"/> Good <input type="checkbox"/> Excellent
Q3	User friendliness of the user interface designs ?
	<input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Satisfactory <input type="checkbox"/> Good <input type="checkbox"/> Excellent
Q4	Helpfulness and Understandability of the error messages ?
	<input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Satisfactory <input type="checkbox"/> Good <input type="checkbox"/> Excellent
Q5	Compatibility of the program with other applications ?
	<input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Satisfactory <input type="checkbox"/> Good <input type="checkbox"/> Excellent
Q6	Performance of the software?
	<input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Satisfactory <input type="checkbox"/> Good <input type="checkbox"/> Excellent
Q7	Please write your suggestions to improve the software.

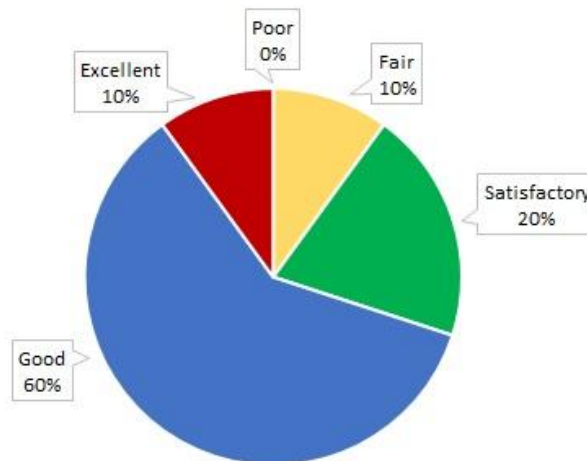
## 5.2.1 User Feedback Analysis

		Poor	Fair	Satisfactory	Good	Excellent
<b>Q1</b>	Navigability of the program	0	2	4	12	2
<b>Q2</b>	Readability of the characters on the screen	0	0	14	4	2
<b>Q3</b>	User friendliness of the user interface designs	0	0	6	12	2
<b>Q4</b>	Helpfulness and Understandability of the error messages	0	2	14	4	0
<b>Q5</b>	Compatibility of the program with other applications	0	2	12	4	2
<b>Q6</b>	Performance of the software	0	0	4	14	2
	Overall feedback of end users	0	6	54	50	10

### 5.2.1.1 Evaluation result for Navigability of the program

Option	Result	Percentage
Excellent	2	10 %
Good	12	60 %
Satisfactory	4	20 %
Fair	2	10 %
Poor	0	0 %

**Table 5.4:** Evaluation result for Navigability of the program



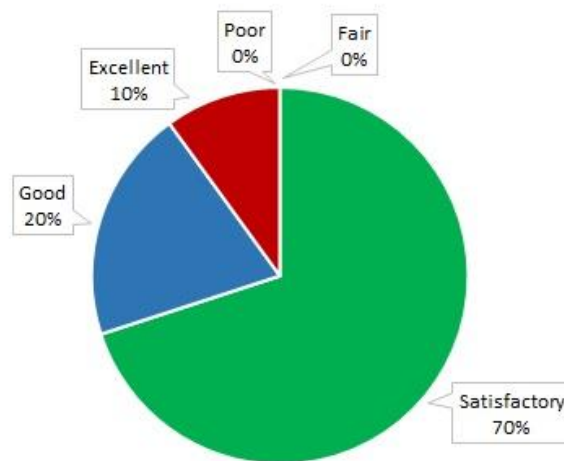
**Figure 5.2:** Graphical representation of Evaluation result for Navigability

According to the above graphical representation 20% of the users say Satisfactory, 60% of users say Good and 10% of the users say it is Excellent. It shows that 80% of the users are satisfied with Navigability of the program.

### 5.2.1.2 Evaluation result for Readability of characters on screen

Option	Result	Percentage
Excellent	2	10 %
Good	4	20 %
Satisfactory	14	70 %
Fair	0	0 %
Poor	0	0 %

**Table 5.5:** Evaluation result for Readability of characters on screen



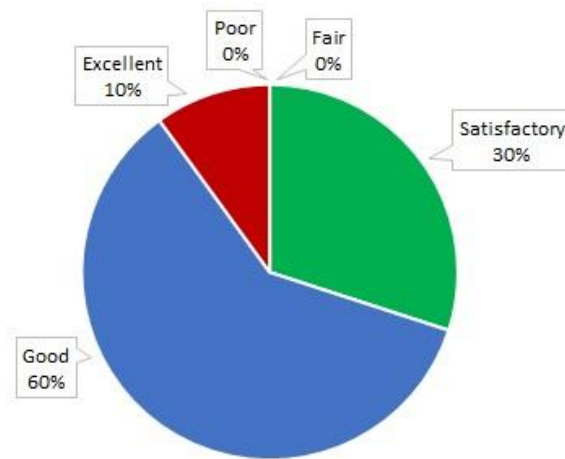
**Figure 5.3:** Graphical representation of Evaluation result for Readability of the characters

Above graphical representation shows 70% of the users say Satisfactory, 20% of the users say Good and 10% of the users say Excellent. It shows that almost all the users are satisfied with Readability of the characters on the screen.

### 5.2.1.3 Evaluation result for User Friendliness of user interfaces

Option	Result	Percentage
Excellent	2	10 %
Good	12	60 %
Satisfactory	6	30 %
Fair	0	0 %
Poor	0	0 %

**Table 5.6:** Evaluation result for User Friendliness of user interfaces



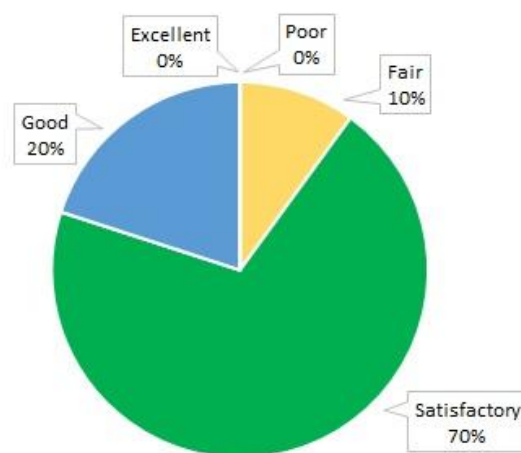
**Figure 5.4:** Graphical representation of Evaluation result for User Friendliness

Above graph clearly shows that there are no end users who say the Interfaces of the application was not User Friendly. Almost all the users say User Interfaces are user-friendly.

**5.2.1.4 Evaluation result for Understandability of error messages**

Option	Result	Percentage
Excellent	0	0 %
Good	4	20 %
Satisfactory	14	70 %
Fair	2	10 %
Poor	0	0 %

**Table 5.7:** Evaluation result for Understandability of error messages



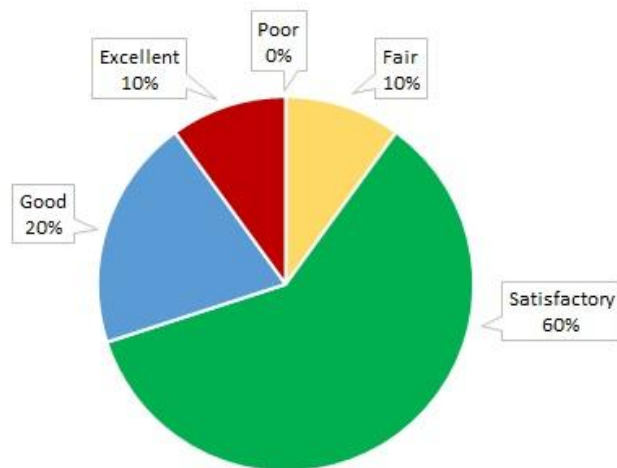
**Figure 5.5:** Graphical representation of Evaluation result for Understandability of messages

Above graphical representation shows 70% of the users say Satisfactory and 20% of the users say Good. It shows that almost all the users say error messages of the application are helpful and understandable.

#### 5.2.1.5 Evaluation result for Compatibility with other applications

Option	Result	Percentage
Excellent	2	10 %
Good	4	20 %
Satisfactory	12	60 %
Fair	2	10 %
Poor	0	0 %

**Table 5.8:** Evaluation result for Compatibility with other applications



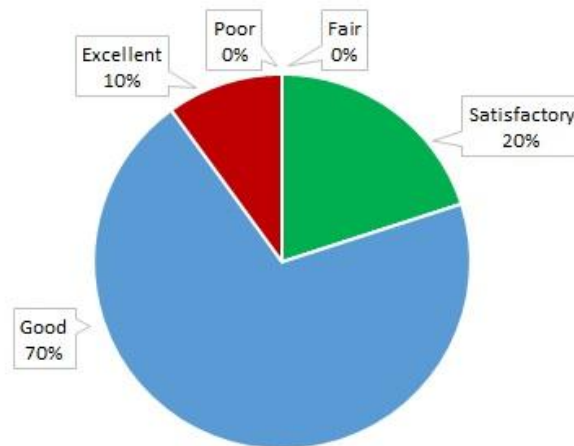
**Figure 5.6:** Graphical representation of Evaluation result for Compatibility with other applications

The above graph shows that there are no users who say Poor and only 10% of the end users say Fair. This clearly indicates that majority of the users are satisfied with compatibility of the software with other applications.

### 5.2.1.6 Evaluation result for Performance of the software

Option	Result	Percentage
Excellent	2	10 %
Good	14	70 %
Satisfactory	4	20 %
Fair	0	0 %
Poor	0	0 %

**Table 5.9:** Evaluation result for Performance of the software



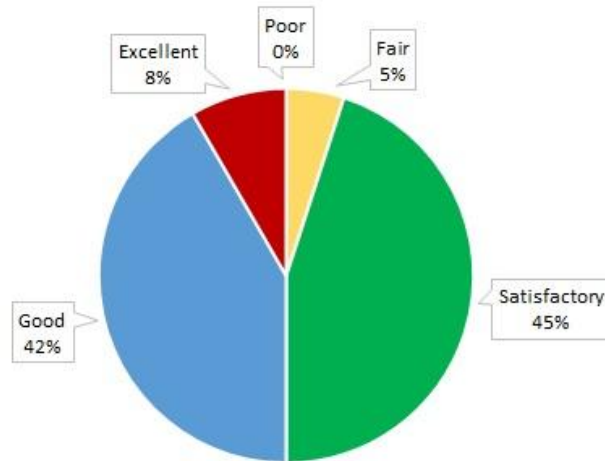
**Figure 5.7:** Graphical representation of Evaluation result for Performance

The above graph clearly shows that there are no users who say Poor or Fair. That is almost all the users are satisfied with performance of the software.

### 5.2.1.7 Evaluation result for Overall feedback of end users

Option	Result	Percentage
Excellent	10	8 %
Good	50	42 %
Satisfactory	54	45 %
Fair	6	5 %
Poor	0	0 %

**Table 5.10:** Evaluation result for Overall feedback of end users



**Figure 5.8:** Graphical representation of Evaluation result for Overall feedback of end users

The above graph shows that 45% of the users say Satisfactory, 42% of the users say Good and 8% of the users say Excellent. So in general we can say that 95% of the users are satisfied with the system.

## **Chapter 6: Conclusion and Future Work**



## 6.1 Conclusion

Almost all the functions requested by JPS Recruitment & Foreign Travel Agency works as per their requirements. Non-functional requirements such as user interface need some alterations and modifications. Not many reports were designed till now but the management has requested a few.

Not much effort was put on the information web site, since the system development took a long time. For the moment the new web based system and the manual paper based system are on parallel run. Once the staff members get used to the system and when it is certain that the new system is free of bugs and produce the expected reports accurately, we can stop the manual paper based system.

Since they do not have IT staff, they might need my assistant often. Have to train someone with sound computer knowledge to carry out administration duties, such as delete records and add job orders.

The new system was hosted on [www.LankaHost.lk](http://www.LankaHost.lk) at the rate of Rs. 7,500/= pa and the domain name ([www.jpsagency.lk](http://www.jpsagency.lk)) was purchased from LK Domain Registry at the rate of Rs. 3,250/= pa.

## 6.2 Learning Experience

This project assisted me to gain a practical experience and apply the knowledge assimilated from the previous courses undertook. Putting the knowledge gained earlier and applying different techniques from past courses was interesting and certain concepts, tools and techniques only made sense after seeing their application in real world scenario.

The importance of planning and finishing work as early as possible was the most important lesson. Initially defined timeline for developing a software project is supposed to be a guideline, deviations from the guideline occur from time to time. It is important to make changes to the work and the guideline to stay on course for meeting the deadline set for the project. Reviewing project work often is necessary to ensure that effort is translated in to meaningful work. Following are some of the lessons learnt during the project work.

- Meeting the project objectives should be the highest priority task.
- Communication skills are vital to a projects success.
- It is absolutely necessary to plan for contingencies.
- Documenting each finding is a must so that everything is clear and concise.
- A properly planned schedule has to be maintained throughout the project.
- Database handling is much easier with Navicat when compared to traditional phpMyAdmin.
- Googled and learned about different SMS gateways and their functionalities, also found sample php codes relevant to SMS and Email.

It was extremely challenging at times but it has been a great and worthwhile learning experience.

### **6.3 Future Work**

This system has many areas where improvement can be made. Following are the future extensions that could be put into action.

- Develop information website of the Agency.
- Improve graphical user interface with advanced Javascript and AJAX.
- Auto complete future for text boxes.
- Customer review system - Most of the websites, especially online business sites have this function. This is another way of letting the potential customers know about the business
- Expand the system to include branches. The owner is planning to expand his business by opening branches at Anuradhapura and Kegalle.
- Develop a more generalized, customizable selling software product.
- Mobile App for Android and iOS - Mobile App is a common tool use by most businesses today and it attracts more customers.

## References

- [1] "Greenway Agencies," [Online]. Available: <http://greenway.lk/greenway/index.php>.
- [2] "Asliya Agencies," [Online]. Available: [http://www.asliyamanpower.com/Job\\_Vacancies.htm](http://www.asliyamanpower.com/Job_Vacancies.htm).
- [3] "OrangeHRM," [Online]. Available: <https://www.orangehrm.com/>.
- [4] "SimpleHRM," [Online]. Available: <https://www.simplehrm.com>.
- [5] "Wikipedia - Sublime Text," [Online]. Available: [https://en.wikipedia.org/wiki/Sublime\\_Text](https://en.wikipedia.org/wiki/Sublime_Text).
- [6] Eukhost-blog, "What is CodeIgniter, and how does it work?," [Online]. Available: <https://www.eukhost.com/blog/webhosting/what-is-codeigniter-and-how-does-it-work/>. [Accessed 05 09 2017].
- [7] "Wikipedia - XAMPP," [Online]. Available: <https://en.wikipedia.org/wiki/XAMPP>.
- [8] "Wikipedia - jQuery," [Online]. Available: <https://en.wikipedia.org/wiki/JQuery>.
- [9] "Wikipedia - Bootstrap (front-end framework)," [Online]. Available: [https://en.wikipedia.org/wiki/Bootstrap\\_\(front-end\\_framework\)](https://en.wikipedia.org/wiki/Bootstrap_(front-end_framework)).
- [10] "TechTarget-HTML5," [Online]. Available: <http://searchmicroservices.techtarget.com/definition/HTML5>.
- [11] "MySQL - The world's most popular open source database," [Online]. Available: <https://dev.mysql.com/doc/refman/5.7/en/what-is-mysql.html>.
- [12] D. Upton, CodeIgniter for Rapid PHP Application Development, 1st ed., Birmingham: Packt, 2007.
- [13] L. Ezell, Practical CodeIgniter 3, Leanpub, 2016.
- [14] D. Flanagan, jQuery Pocket Reference: Read Less, Learn More.
- [15] "MySQL Tutorialspoint," [Online]. Available: <https://www.tutorialspoint.com/mysql>.
- [16] "Bootstrap - The most popular HTML, CSS, and JS library in the world," GitHub Inc, 2012. [Online]. Available: <https://getbootstrap.com>. [Accessed 1 October 2017].
- [17] "Wikipedia - Navicat," [Online]. Available: <https://en.wikipedia.org/wiki/Navicat>.
- [18] "OpenHR," [Online]. Available: <https://openhr.wordpress.com/2013/04/29/open-source-hrm-technical-details-compared>.
- [19] "TechRepublic," [Online]. Available: <https://www.techrepublic.com/blog/linux-and-open-source/best-open-source-hrm-and-erp-solutions>.

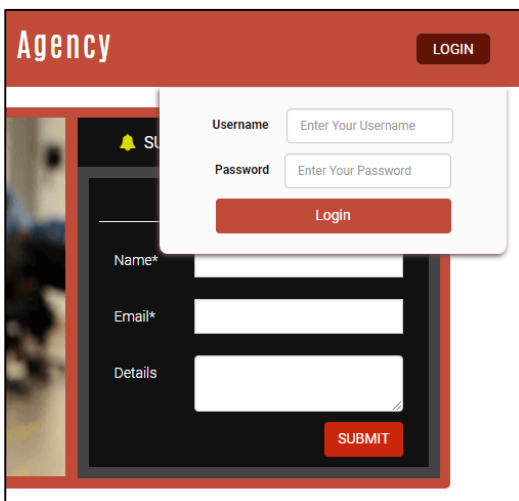
## **Appendix A – User Manual**

## Start Screen



This is the startup screen of the program. Click login button.

## Login Pop-up Window



This is the login screen. You are required to enter your username and password to continue.

## View All System Users Screen

	Username	Name with Initials	Mobile Phone	Level	Status	
1	Janaka	Ekanayaka EMJK	0716282558	Adminstrator	Active	
2	Madusha	Silva THMK	0766385200	Staff	Inactive	
3	Thushari	Thenakoon HMTDK	0778896200	Adminstrator	Active	
4	Chathurika	Sandamali SPMC	0714088736	Staff	Active	
5	Dhananjani	Weerasingha IMAD	0764617398	Staff	Active	
6	Jagath	Sirivardhana RHJ	0717861700	Adminstrator	Active	
7	Udara	Madushan U	0773989367	Adminstrator	Active	
8	User	User Account for Testing (Password = user)		Staff	Inactive	

This screen lists all registered users and their basic details. You have the provision to delete or edit user details.

## Add New System User Screen

Username*	:	<input type="text" value="Namal"/>
User Group	:	<input type="text" value="Staff"/>
Password*	:	<input type="password" value="..."/>
Re-type Password*	:	<input type="password" value="..."/>
Name with Initials	:	<input type="text" value="Mr. Perera SMN"/>
NIC Number	:	<input type="text" value="892201134V"/>
Address	:	<input type="text" value="10, 1st Street, Malkaduwawa, Kurunegala"/>
Mobile Phone	:	<input type="text" value="07176305000"/>
Home Phone	:	<input type="text" value="03722359002"/>

This screen is used to add a new user to the system. Username, User Group and password are mandatory fields.

### View All Job Seekers Screen

Name	Mobile	Alt Phone	Email	Status
1 Udara	0773989367		udamadu@gmail.com	Inactive
2 Jagath D	0767861700		jagaths@gmail.com	Inactive
3 Jagath M	0717861700	0767861700	jagaths@gmail.com	Inactive
4 Pathirana	0775686951			Inactive
5 Nirosha	0716414294			Inactive
6 Liyanage	0717684295			Inactive
7 Hirun	0758262206			Inactive
8 Anusha Thilina	0777158953			Inactive
9 Shami Bandara	0714844371			Inactive

This screen lists all registered job seekers. You are given the provision to edit the details as well as you can add memos about a job seeker.

### Add New Job Seeker Screen

Name\* : Perera  
 Mobile Phone No.\* : 0712306789  
 Alternate Phone No. :  
 Email : perera@yahoo.com  
 Birth Date : 1980-03-11  
 Gender : Male  
 City : Narammala  
 Present Job : Mason  
 Can Speak English ? :   
 Can Speak Tamil ? :

This is the screen used to add a new job seeker to the system. Fill in the details and click Add New.



## View All Applicants Screen

	Name	Reg. No.	NIC	Passport No	Mobile No	Status	
1	Mrs. JANK Chandika	P00007	786733448V		787818214	Active	Add memo
2	Ms. BSL Fernando	R00001	906960753V		719145235	Active	Add memo
3	Mr. RD Gemunusiri	R00010	813623722V		786022403	Active	Add memo
4	Mrs. VS Jayanthi	P00122	745541496V		715303106	Active	Add memo
5	Mr. KADS Karunaratna	R00013	943053499V		716566813	Active	Add memo
6	Mr. KK Kularathna	R00004	703574297V		774054669	Active	Add memo
7	Mr. EAAU Kumara	R00002	853641898V		723933572	Active	Add memo
8	Mrs. JA Kusumalatha	R00005	906960753V		710854533	Active	Add memo

Applicants currently registered are listed here. You have the provision to modify applicant details, add new passport details as well as you can add memos about the applicant.

## Add New Applicant Screen

Registration Number\* : R30025

Salutation\* : Mrs.

Surname\* : Padmalatha

Initials\* : RHK

Gender : Female

Birth Date : 1979-03-23

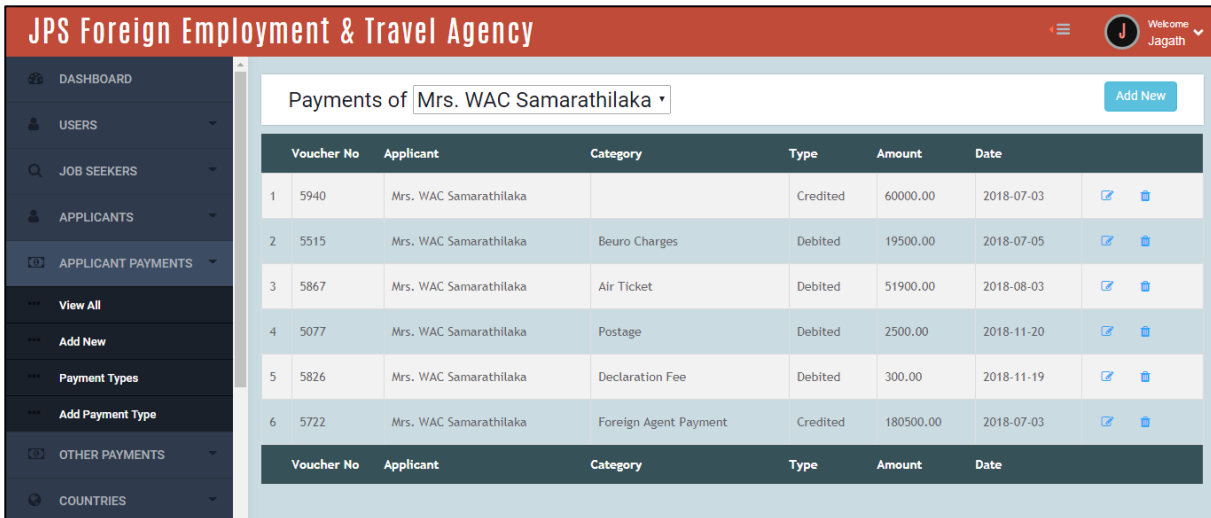
NIC Number\* : 795506730V

Passport Number\* :

Mobile Number\* : 0776518639

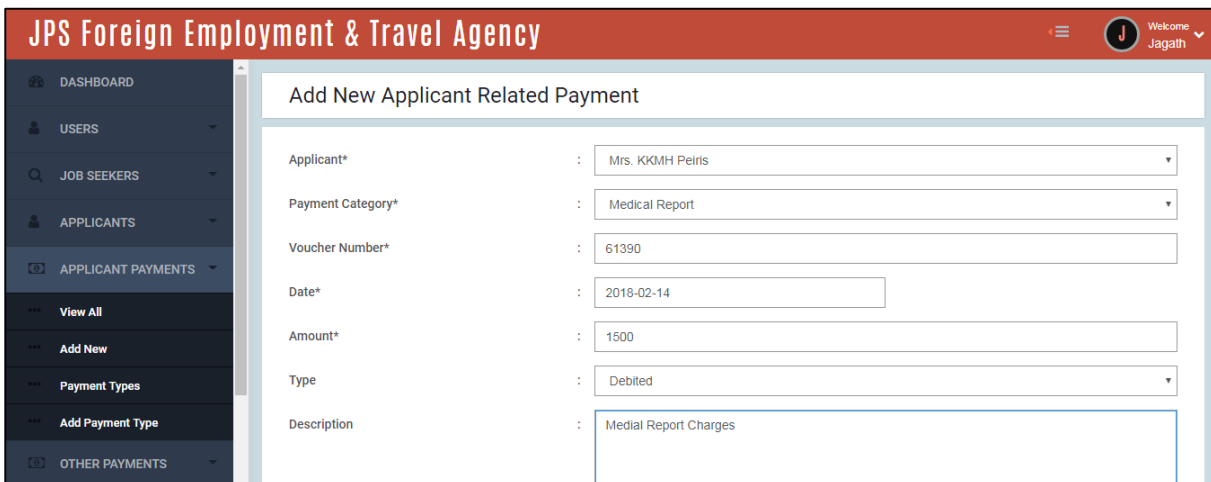
New applicant details are added to the system via this screen.

### View All Applicant Payments Screen



All payments related to a specific applicant can be viewed via this screen. You have the provision to delete or modify a specific payment.

### Add New Applicant Related Payment Screen



Payments related to applicants can be added to the system via this screen. Select the applicant then the payment type and fill in the rest of the details.

## View All Applicant Payment Types Screen

Payment Types				Add New	
	Description	Status			
1	Sub Agent Payment	Enabled			
2	Foreign Agent Payment	Enabled			
3	Passport	Enabled			
4	Medical Report	Enabled			
5	Police Report	Enabled			
6	Beuro Charges	Enabled			
7	Visa	Enabled			
8	Visa Translation Fee	Enabled			
9	Declaration Fee	Enabled			

Currently available applicant related payment types are listed here. You have the provision to delete as well as you can modify existing payment types.

## Add New Applicant Payment Type Screen

Add New Payment type

Description\* :

Status :

Add Type

You can create new applicant related payment types via this screen. Also you can disable existing payment types too.

## **Appendix B – Database Design**

## Table Creation Scripts

These are the scripts that will be used to create tables in MySQL database schema.

### Table structure for 01\_job\_seeker

```
CREATE TABLE `01_job_seeker` (
  `job_seeker_id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `reg_date` date NOT NULL,
  `phone_no` varchar(10) NOT NULL,
  `phone_2` varchar(10) DEFAULT NULL,
  `name` varchar(100) NOT NULL,
  `email` varchar(200) DEFAULT NULL,
  `birth_date` date DEFAULT NULL,
  `gender` tinyint(1) unsigned NOT NULL,
  `city` varchar(30) DEFAULT NULL,
  `present_job` varchar(30) DEFAULT NULL,
  `expected_job` varchar(30) DEFAULT NULL,
  `english_language` tinyint(1) unsigned DEFAULT NULL,
  `tamil_language` tinyint(1) unsigned DEFAULT NULL,
  `have_passport` tinyint(1) unsigned DEFAULT NULL,
  `done_foreign_job` tinyint(1) unsigned DEFAULT NULL,
  `have_driving_license` tinyint(1) unsigned DEFAULT NULL,
  `qualification` tinyint(1) unsigned DEFAULT NULL,
  `status` tinyint(1) unsigned NOT NULL DEFAULT '1',
  PRIMARY KEY (`job_seeker_id`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

### Table structure for 02\_inquiry

```
CREATE TABLE `02_inquiry` (
  `inquiry_id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `date_time` datetime NOT NULL DEFAULT '0000-00-00 00:00:00',
  `memo` varchar(255) CHARACTER SET utf8 DEFAULT NULL,
  `job_seeker_id` int(10) unsigned NOT NULL,
  PRIMARY KEY (`inquiry_id`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

**Table structure for 03\_applicant**

```
CREATE TABLE `03_applicant` (  
  `applicant_id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `reg_no` varchar(10) NOT NULL,  
  `nic_no` varchar(12) CHARACTER SET utf8 NOT NULL,  
  `reg_date` date NOT NULL,  
  `name_with_initials` varchar(50) NOT NULL,  
  `gender` char(1) NOT NULL,  
  `address` varchar(200) DEFAULT NULL,  
  `email` varchar(50) DEFAULT NULL,  
  `phone_1` varchar(10) NOT NULL,  
  `phone_2` varchar(10) DEFAULT NULL,  
  `phone_relative` varchar(10) DEFAULT NULL,  
  `birth_date` date NOT NULL,  
  `civil_status` varchar(20) DEFAULT NULL,  
  `race` varchar(20) DEFAULT NULL,  
  `religion` varchar(20) DEFAULT NULL,  
  `weight` tinyint(2) unsigned DEFAULT NULL,  
  `height` tinyint(3) unsigned DEFAULT NULL,  
  `spouse_name` varchar(100) DEFAULT NULL,  
  `sign_path` varchar(200) DEFAULT NULL,  
  `photo_passport_path` varchar(255) DEFAULT NULL,  
  `photo_4r_path` varchar(255) DEFAULT NULL,  
  `middle_east_exp` tinyint(2) unsigned DEFAULT '0',  
  `qualification` varchar(20) DEFAULT NULL,  
  `family_b_r_received` tinyint(1) unsigned DEFAULT '0',  
  `police_r_received` tinyint(1) unsigned DEFAULT '0',  
  `medical_r_received` tinyint(1) unsigned DEFAULT '0',  
  `visa_received` tinyint(1) unsigned DEFAULT '0',  
  `air_t_received` tinyint(1) unsigned DEFAULT '0',  
  `departure_date` date DEFAULT NULL,  
  `status` tinyint(1) unsigned NOT NULL DEFAULT '1',  
  `job_cat_id` int(10) unsigned DEFAULT NULL,  
  `job_order_id` int(10) unsigned DEFAULT NULL,  
  PRIMARY KEY (`applicant_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

**Table structure for 04\_introduced\_by**

```
CREATE TABLE `04_introduced_by` (
  `introduced_by_id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `sub_agent_id` tinyint(3) unsigned NOT NULL,
  `applicant_id` int(10) unsigned NOT NULL,
  `agreed_amount` smallint(10) unsigned DEFAULT NULL,
  PRIMARY KEY (`introduced_by_id`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

**Table structure for 05\_sub\_agent**

```
CREATE TABLE `05_sub_agent` (
  `sub_agent_id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `good_name` varchar(20) CHARACTER SET utf8 NOT NULL,
  `nic_no` char(12) CHARACTER SET utf8 NOT NULL,
  `full_name` varchar(100) CHARACTER SET utf8 DEFAULT NULL,
  `address` varchar(150) CHARACTER SET utf8 DEFAULT NULL,
  `phone_1` varchar(10) CHARACTER SET utf8 NOT NULL,
  `phone_2` varchar(10) CHARACTER SET utf8 DEFAULT NULL,
  `join_date` date NOT NULL,
  `status` tinyint(1) unsigned NOT NULL DEFAULT '1',
  PRIMARY KEY (`sub_agent_id`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

**Table structure for 06\_passport**

```
CREATE TABLE `06_passport` (
  `pp_no` varchar(10) NOT NULL,
  `issue_date` date NOT NULL,
  `expiry_date` date NOT NULL,
  `collected_by` varchar(50) DEFAULT NULL,
  `collected_date` date DEFAULT NULL,
  `issued_back_date` date DEFAULT NULL,
  `issued_back_reason` varchar(100) DEFAULT NULL,
  `blacklist_status` varchar(255) DEFAULT NULL,
  `remarks` varchar(255) DEFAULT NULL,
  `status` tinyint(1) unsigned NOT NULL DEFAULT '0',
  `applicant_id` int(10) unsigned NOT NULL,
  `face_page_path` varchar(255) DEFAULT NULL,
  `name_page_path` varchar(255) DEFAULT NULL,
  `renewal_page_path` varchar(255) DEFAULT NULL,
```

```
`alterations_page_1_path` varchar(255) DEFAULT NULL,  
`alterations_page_2_path` varchar(255) DEFAULT NULL,  
`visa_page_1_path` varchar(255) DEFAULT NULL,  
`visa_page_2_path` varchar(255) DEFAULT NULL,  
PRIMARY KEY (`pp_no`)  
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

#### Table structure for 07\_under\_go

```
CREATE TABLE `07_under_go` (  
  `under_go_id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `program_id` int(10) unsigned NOT NULL,  
  `applicant_id` int(10) unsigned NOT NULL,  
  PRIMARY KEY (`under_go_id`),  
  KEY `fk_under_go_program_id` (`program_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

#### Table structure for 08\_training

```
CREATE TABLE `08_training` (  
  `program_id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `name` varchar(100) NOT NULL,  
  `duration` tinyint(2) unsigned NOT NULL,  
  `language` varchar(10) NOT NULL,  
  `status` tinyint(1) unsigned DEFAULT NULL,  
  PRIMARY KEY (`program_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

#### Table structure for 09\_dislike

```
CREATE TABLE `09_dislike` (  
  `dislike_id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `country_id` int(10) unsigned NOT NULL,  
  `applicant_id` int(10) unsigned NOT NULL,  
  PRIMARY KEY (`dislike_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```



**Table structure for 10\_country**

```
CREATE TABLE `10_country` (  
  `country_id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `name` varchar(30) NOT NULL,  
  `currency` varchar(15) DEFAULT NULL,  
  `currency_code` char(3) NOT NULL,  
  `status` tinyint(1) unsigned NOT NULL DEFAULT '1',  
  PRIMARY KEY (`country_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

**Table structure for 11\_capable\_of**

```
CREATE TABLE `11_capable_of` (  
  `capable_of_id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `language_id` int(10) unsigned NOT NULL,  
  `applicant_id` int(10) unsigned NOT NULL,  
  PRIMARY KEY (`capable_of_id`),  
  KEY `fk_capable_of_language_id` (`language_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

**Table structure for 12\_language**

```
CREATE TABLE `12_language` (  
  `language_id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `name` varchar(20) NOT NULL,  
  `status` tinyint(1) unsigned NOT NULL,  
  PRIMARY KEY (`language_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

**Table structure for 13\_conversation**

```
CREATE TABLE `13_conversation` (  
  `conversation_id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `date_time` datetime NOT NULL DEFAULT '0000-00-00 00:00:00',  
  `memo` varchar(255) CHARACTER SET utf8 NOT NULL ,  
  `applicant_id` int(11) unsigned NOT NULL,  
  PRIMARY KEY (`conversation_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

**Table structure for 14\_job\_category**

```
CREATE TABLE `14_job_category` (  
  `job_cat_id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `job_cat_no` tinyint(2) unsigned NOT NULL,  
  `job_cat_name` varchar(50) NOT NULL,  
  `salary` smallint(5) unsigned NOT NULL,  
  `no_of_vacancies` tinyint(3) unsigned NOT NULL,  
  `remaining_vacancies` tinyint(3) unsigned DEFAULT NULL,  
  `job_order_id` int(10) unsigned NOT NULL,  
  `agreed_amt` smallint(5) unsigned DEFAULT NULL,  
  PRIMARY KEY (`job_cat_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

**Table structure for 15\_job\_order**

```
CREATE TABLE `15_job_order` (  
  `job_order_id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `job_order_no` varchar(20) NOT NULL,  
  `valid_from` date NOT NULL,  
  `valid_to` date NOT NULL,  
  `contract` tinyint(1) DEFAULT NULL,  
  `accomodation` tinyint(1) DEFAULT NULL,  
  `medical` tinyint(1) DEFAULT NULL,  
  `air_ticket` tinyint(1) DEFAULT NULL,  
  `food` tinyint(1) DEFAULT NULL,  
  `blacklisted` tinyint(1) unsigned NOT NULL DEFAULT '0',  
  `status` tinyint(1) unsigned NOT NULL DEFAULT '1',  
  `for_agent_id` int(10) unsigned NOT NULL,  
  PRIMARY KEY (`job_order_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

**Table structure for 16\_foreign\_agent**

```

CREATE TABLE `16_foreign_agent` (
  `for_agent_id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `good_name` varchar(50) DEFAULT NULL,
  `name` varchar(150) NOT NULL,
  `address` varchar(150) DEFAULT NULL,
  `country` int(10) unsigned NOT NULL,
  `phone_1` varchar(20) NOT NULL,
  `phone_2` varchar(20) DEFAULT NULL,
  `email` varchar(100) DEFAULT NULL,
  `memo` varchar(255) DEFAULT NULL,
  `currency_code` char(3) NOT NULL,
  `join_date` date NOT NULL,
  `status` tinyint(1) unsigned DEFAULT '1',
  PRIMARY KEY (`for_agent_id`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;

```

**Table structure for 17\_payment\_applicant**

```

CREATE TABLE `17_payment_applicant` (
  `payment_id` int(10) unsigned NOT NULL AUTO_INCREMENT,
  `voucher_no` varchar(15) NOT NULL,
  `date` date NOT NULL,
  `description` varchar(30) DEFAULT NULL,
  `amount` decimal(9,2) unsigned NOT NULL,
  `dr_cr` char(1) NOT NULL,
  `payment_type_id` tinyint(3) unsigned NOT NULL,
  `applicant_id` int(10) unsigned NOT NULL,
  PRIMARY KEY (`payment_id`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;

```

**Table structure for 18\_payment\_type**

```

CREATE TABLE `18_payment_type` (
  `payment_type_id` tinyint(3) unsigned NOT NULL
  AUTO_INCREMENT,
  `description` varchar(30) DEFAULT NULL,
  `applicant_related` tinyint(1) unsigned DEFAULT NULL,
  `status` tinyint(1) unsigned NOT NULL DEFAULT '1',
  PRIMARY KEY (`payment_type_id`)
) ENGINE=InnoDB DEFAULT CHARSET=latin1;

```

**Table structure for 19\_payment\_other**

```
CREATE TABLE `19_payment_other` (  
  `payment_id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `voucher_no` varchar(15) NOT NULL,  
  `date` date NOT NULL,  
  `description` varchar(30) CHARACTER SET utf8 DEFAULT NULL,  
  `amount` decimal(9,2) unsigned NOT NULL,  
  `dr_cr` char(1) NOT NULL,  
  `payment_type_id` tinyint(3) unsigned NOT NULL,  
  PRIMARY KEY (`payment_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

**Table structure for 20\_system\_setting**

```
CREATE TABLE `20_system_setting` (  
  `id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `key` varchar(100) NOT NULL,  
  `name` varchar(100) NOT NULL,  
  `description` varchar(255) DEFAULT NULL,  
  `default` varchar(255) DEFAULT NULL,  
  `value` text,  
  PRIMARY KEY (`id`)  
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```

**Table structure for 21\_system\_user**

```
CREATE TABLE `21_system_user` (  
  `user_id` int(10) unsigned NOT NULL AUTO_INCREMENT,  
  `username` varchar(25) NOT NULL,  
  `password` varchar(255) NOT NULL,  
  `pw_reset_key` varchar(255) NOT NULL,  
  `name_with_initials` varchar(100) NOT NULL,  
  `nic_no` char(12) NOT NULL,  
  `address` varchar(255) NOT NULL,  
  `phone_1` varchar(10) NOT NULL,  
  `phone_2` varchar(10) DEFAULT NULL,  
  `email` varchar(255) DEFAULT NULL,  
  `join_date` date NOT NULL,  
  `resign_date` date DEFAULT NULL,  
  `profile_pic` varchar(255) DEFAULT NULL,  
  `group` tinyint(1) unsigned NOT NULL,
```

```
`status` tinyint(1) unsigned NOT NULL DEFAULT '1',  
PRIMARY KEY (`user_id`)  
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```