Real Time Recruitment System

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Declaration

I declare that this thesis is my own work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education. Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.

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Signature of Supervisor: _____

Date:

Dedication

I would dedicate this thesis to my beloved parents who have never failed to give me a tremendous support, for giving all not only throughout my project but also throughout my life. As well they teach me that even the largest task can be accomplished if it is done one step at a time.

Acknowledgement

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Thank you.

Abstract

Real Time Recruitment System is web based recruitment system which is analyzing user profile and processing system. There are many job seeking websites in the Internet. But many jobs seeking websites do not support real time and analyze candidates. Because of that project is aimed to develop Real Time Recruitment System to reduce the problem. The Real Time Recruitment System provides real time access for candidates in Sri Lanka on simple and effective way not only that user can upload their current resume to system without filling forms. This project helps to minimize the expenditure of the employer to selecting suitable employees without checking each and every applicators profile. This system allow for single sign on login, real time data processing, SMS gateway integration and SMTP Configuration. As well as the system enable mobility, user friendly, easy access to get job details via SMS and higher data security for candidates and employers. This System enable to search job, upload resume, create covering letter, apply for job, save job for further requirement, SMS job alert and apply to job via SMS real timely activity for candidates. Employers can handle their company profile, create an advertisement using template easily, post their vacancies and generate applied candidate's detailed report for their jobs. The administrator can do active, deactivate, pending, add, delete and modify users, jobs and employers. Also, administrator can handle the entire system configurations and generate various types of reports. An administrator has all other user privileges. The system provides to access facility for guest user to search job. In this system develop used by PHP, CSS, JavaScript and MySQL. Ozeki Massage server, WAMP server and some open source tool are used to develop system. As the future work, human resource management module to be able to include in the system to manage the interview process easily. After the testing and user evaluation decide that, the online job board system is worked simple and effective way for all users. Finally it is concluded that system enhance job seeking facility to real time access via SMS.

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Introduction

1.1 Introduction

This chapter describes about problem overview of this project, project goals, project objective and scope of project. Also short descriptions about remaining chapters of the dissertation are included.

1.2 Background and Motivation

One of the main problems in Sri Lanka has been to match job vacancies in the private sector with educated unemployed. The employer was faced with many difficulties to found qualified employee in their company and another side unemployed people were faced with difficulties found job with matching their educational qualification and preference.

In this case, employers were published paper or online advertisement to find the best job applicants for their job vacancies and candidates were looking job advertisement for finding a desired job. But this process at least got three or four weeks for selected suitable employee for the company. Also, candidates were looked on long time to find a job. Bad side of that, the newspaper and online websites was getting time to publish an advertisement, company was spent higher cost for newspaper and online advertisement, postal application where delay and sometime lost out and delay selecting manual processing of job applications such as view applicant's profiles and email them.

Robert J. McGovern was introduced employment website in 1994 to solution for manual job management, but it was a very basic solution for manual job management [1]. After that, many job seeking website are released to the Internet. Such as www.indeed.com, www.monster.com, and www.careerbuilder.com are famous and higher rank of the user

access website in the world[2]. Also, Sri Lanka has been famous job seeking websites. Mainly www.topjobs.lk and www.cv.lk are famous job seeking web site between employer and candidate. But those all online solutions required to fill lot of forms by candidates not only that employer and candidate needs to Internet connection for access to this web site and must do manually analyze applications and resumes.

According to the statistical report, Sri Lankan's Internet usage is around 30% of a country's population[3]. Sri Lankan people access to the Internet through broadband connection in the household, Internet cafe service, mobile phone etc. Most of people used to Internet using mobile phone. But with high cost, people have not access Internet facility at every time. So that, candidates have not access jobs seeking web site through Internet always. But another reason of that, jobs seeking websites are not supported for real time access facility in Sri Lanka. Because of that candidate must go to online for applying for a job at every time.

Because of that, this project is aimed to develop Real Time Recruitment System to reduce all current problems in recruitment process. Also, this project helps to minimize the expenditure of employer for selecting suitable employees very quickly.

1.3   Aim and Objectives
Aim

The project is aimed to provide real time access facility for candidates to apply preferred job at any time and analyzing user profile and processing system. Overcome inefficiency of the time consuming paper based workflows with the use of web technology and an appropriate database with an attractive graphical user friendly interface. Also, this will be able to minimize the expenditure of employer and increase the suitable job choices for candidates.

Objectives

The project objectives are to develop a system to archive real time access job site for Sri Lankan candidates to simple and effective way. The Online Job Board System enables mobility, user friendliness, ease access without Internet usage via SMS and higher data security for candidates and employers.

The project focuses on the implementation of web portal to achieve following set of deliverables.

- Candidate and Employer registration.
- User profile management.
- Upload candidate's resume and process.
- Analyze candidate's resume and predict suggestions.
- Post and Manage job vacancies.
- Search, Save and Apply job facility
- Report generation
- Send job details via SMS alert
- Apply to job via SMS.

1.4   Proposed Solution

The system is designed with three main users such as administrator, candidate and company. Administrator has the full authority over the website. He can view all the registered users, company details and have the power to edit, delete as well as update them. A candidate can register himself and once he will be directed to his homepage he can update his profile, change password and see the current vacancies and all. A company can register itself after register company need to login and then company can post job vacancies, approve or disapprove candidates who applied and search resumes.

The system development architecture can be considered basically as three tire architecture, where middle layer or the business layer communicates with database components and

users. Business layer interfaces user to access data components and security layer covers entire communication links between these layers.

Acceptance and rejection of applications can be completed with just a few keystrokes or mouse clicks, leaving more time for the user. The system provides various types of services, operations and high level of efficiency in recording and information dissemination thus reducing errors and also a single secure database structure that organizes stores and retrieves real time information. The technology, solutions and features of this system are aimed at providing unlimited "scalability".

This online recruitment system runs on minimal hardware and software. The system runs entirely over the Internet and use mobile Short Message Service(SMS). Therefore administrators and company needs Internet facility also there are two main requirements as server side and client side. As sever side the system is built on reliable and secure technologies. Apache is the web server and language is using for development is PHP, database is MySQL.

The recruitment process begins with the identification of a vacancy where after the recruiter receives authorization to fill in this vacancy. Vacancies will be published on job system. After that applicants can apply for vacancies by using the Internet or via SMS. This system has reduced costs and created a link between employers and employees across. Intelligent applicant tracking has come in because it manages much of the laborious work and targets the best candidates for the job. The system minimizes set up costs and the burden of ongoing maintenance. The system has also assisted candidates to get access to careers on the website. The applicants can apply online and after their applications have been processed they are notified through the Internet. Further to this, the system has made recruitment easy because the Curriculum Vitae of applicants can be kept in the database and whenever an opportunity arises they are notified.

1.5 Structure of dissertation

Chapter 1 Introduces and next chapter 2 forms the background material for the project, reviewing the existing literature on job portal systems, followed by a detailed review of the manual recruitment system vs automated e recruitment systems. Further chapter 3 survey on technology used for similar problems and then chapter 4 discuss how far the adopted technology will help to solve the selected problem. Chapter 5 outlines the design process and initial specification that will be used to enable the implementation of the project. Chapter 6 outlines the system implementation process. Chapter 7 outlines the overall evaluation and testing of the system.

1.6 Summary

Web based recruitment systems always depend with three statistics mainly. first, candidates need to be attracted. This concerns using the organization's reputation, product image, online technology and other methods to draw as many potential applicants as possible to the organization's website. There, organizations can reinforce their human resources brand and provide information about jobs and working conditions. The second step in this process is sorting applicants. This relates for example to employing sophisticated, standardized online tests to screen candidates and winnowing the applicant pool to a manageable number. Third, the contacts need to be managed quickly. Due to the use of the Internet, organizations are able to respond more quickly to a desirable candidate. Organizations need to work aggressively and use automated hiring management systems to contact the most desirable candidates very quickly, before they are snapped up by another company. Finally the organization can make a phone call and set up a meeting. Likewise, further correspondence between organization and applicant depends on the Internet to a large extent.

The Existing Literature on Real Time Recruitment System

2.1   Introduction

Previous chapter provide indirection for this research project. It's outlined the project aims and objectives as well as brief description about propose solution. In this chapter focused to review pervious works done in this research domain.

2.2   Overview of Existing Online Recruitment Systems

When having a quick look at the overall trends in Online recruiting shows the rise in the importance of marketing the web site, online training, dawn of video interviews and emergence of professional Internet Recruiters. Online recruiting and online recruiting systems, with its emphasis on a more strategic decision making process is fast gaining ground as a popular outsourced function. Recruitment applications are designed to do a whole lot more than just reduce paperwork. They can make a significant contribution to a company's marketing and sales activity. Recruitment websites and software make possible for managers to access information that is crucial to managing their staff, which they can use for promotion decisions, payroll considerations and succession planning. Companies and recruitment agents have moved much of their recruitment process online so as to improve the speed by which candidates can be matched with live vacancies.

The e-recruitment process in three steps. First, candidates need to be attracted. This concerns using the organization's reputation, product image, online technology and other methods to draw as many potential applicants as possible to the organization's website. There, organizations can reinforce their human resources brand and provide information about jobs and working conditions. The second step in this process is sorting applicants. This relates, for example, to employing sophisticated, standardized online tests to screen candidates, and winnowing the applicant pool to a manageable number. Third, the contacts

need to be managed quickly. Due to the use of the Internet, organizations are able to respond more quickly to a desirable candidate.

2.1.1 Review on Topjobs.lk

Topjobs.lk is a famous website in Sri Lanka for recruitment. There is an online recruitment system used by employers to list their vacancies online and also handle online applications from candidates [4]. Top jobs completes and automates the entire recruitment cycle and gives an electronic 'back-office' to make recruiting easy, fast and efficient. A candidate can browse or search for vacancies and apply online immediately. Then an application will be sent straight-through to the HR team of topjobs registered employers. Employers will contact shortlisted candidate. topjobs give to complete and comprehensive electronic recruitment platform for online vacancy advertising, and for automating the recruitment process in a totally paperless environment for employers. Candidate can upload CV, profile photo and update their profile anytime by logging to account. Also, candidate can activate SMS alert to get any job details.

But Topjob.lk not provide services to candidate's profile analyzing and there are some of the drawbacks are identified in this website. Those are,

- Need to answer the unwanted question.

- A candidate has got SMS alerts about job vacancies. But there is no way to apply it instantly. Hence candidate must go to online for applying jobs.

- The home page is a lengthy list in job vacancy details. So it decreased that usability of the website.

- Seeking job vacancy details, the user must always close to open tab.

- Candidate's cannot copy text from website.

2.2.1   Cv.lk

CV.lk is another famous web site in Sri Lanka[5]. CV.lk provides the facility to connect a social network on Facebook. Also provides facilities to candidates search jobs, upload resume, save covering letter, apply for job, save job for further requirement and SMS job alert. Employers will be able to create their company profile, post their vacancies and search resumes. The administrator will be able to approve, set-active, add, modify or delete user and can post, modify, delete, reject or repost advertisement of employers. But main drawback is cv.lk not supported to mobile also real time accept applications not only that but also when create new account candidate has to fill lot of forms to create his profile. Also there is not any facilitate to analyze candidate's accounts. Every application processing should do manually by company.

2.2.2   Careerbuilder.com

Careerbuilder.com was famous website in outside of Sri Lanka[6]. This web site has mobile accessibility. Also website provides to facility to connect social network. Search job, upload CV, Save Covering letter, apply for job, save job for further requirement, upload photo and process of applying jobs are provided another facility for candidates. Employers can create their company profile, post their vacancies and search CVs. The administrator can approve, set-active, add, modify or delete users and can post, modify, delete, reject or repost vacancies of employers. Also, Administrator   can handle system configuration and access other user's privileges. But there are some drawbacks on Careerbuilder.com website. Those are,

- Candidate need to fill several forms to create his/her profile.

- There is no profile analyzing method to filter candidate profiles without doing manual.

- Seeking job vacancy details loaded another web page in this website. It takes some time to load page and decrease performance of this website.

2.2.3 Analysis of job seeking website functional features

In the previous section discussed about famous job site in Sri Lanka and outside of the country. These sites have some valuable functional features. These functional features are listed down and analysis with each other. Comparison of these functional features are presented in the Table 2-1.

Functional Feature	careerbuilder.com	cv.lk	Topjobs.lk
Automate profile analyzing function	×	×	×
Single Sign On(SSO) system	×	×	×
Profile create through uploading available resume	×	×	×
Search job	√	√	√
Candidate can save job information	√	√	√
Upload CV	√	√	√
Save Cover Letter	√	√	√
Apply job	√	√	√
SMS alert	×	√	√
E-mail alert	√	√	√
Upload profile image	√	×	√
Know about Apply job process	√	×	√
Create Company Profile	√	√	√
Post vacancies and search CVs by Employers	√	√	√
The administrator can post, modify, delete, reject or repost advertisement of employers	√	√	√

Handle interview process	√	×	√
Mobile accessibility	√	×	√
Connected to social media	√	√	√

Table 2-1 : Analysis of available functional features in websites

After analyzing available functional features, some of functional features are selected to implement Real Time Recruitment System. But these websites are not available for candidate profile create via available resume, candidate profile analyzing and applying to job via SMS. After including this features in new development, it is helpful to candidates apply to job real time and employer benefited to automated candidate profile analyzing system select most suitable candidate from applications. As well as new features helps to both candidates and employers to reduce time gap job post to select suitable candidate.

The project aim is developing a system with real time access facility job site for Sri Lankan candidates. Consider about above functional features and project aims, selected following functional features are good for the new developing system.

2.3   Summary

Most of the companies have begun to advertise the job vacancies in newspapers as well as in Internet it gives an indication of an expected growth level of Internet usage for recruitments in the future. Companies cannot move out from the traditional approach completely since the unavailability of required information technology infrastructure for the whole population, there is an indication that companies are in the process of moving towards the online recruiting specially for white collar jobs. Even most of the management has positive attitudes towards e-recruitment and they are willing to move towards online recruiting majority of them find it difficult to implement an effective online recruitment system. Most of the organizations future expectation is to enhance the methods used for Internet based recruiting activities. The organizations further pointed out that there is a high

need of education among organizations and people in Sri Lanka regarding the use of Internet for recruitment activities. Next chapter consider about adopted technologies that used for solve the research problem.

Technology Adapted

3.1 Introduction

Previous chapter describe about available literatures related to the research Real Time Recruitment System. This chapter mainly concern about technologies that use for developing the Real Time Recruitment System. Mainly used PHP server side scripting language for developing the system and MySQL Relational Database Management System (RDBMS) for maintain the system database. Windows Apache MySQL PHP (WAMP) server is use as web server to run this application on Windows environment[7].

3.2 Technologies which can be adopted to the system

Web applications are by nature distributed applications, meaning that they are programs run on more than one computer and communicate through a network. Specifically, web applications are accessed with a web browser and are popular because of the ease of using the browser as a user client. For the enterprise, the ability to update and maintain web applications without deploying and installing software on potentially thousands of client computers is a key reason for their popularity. Web applications are used for web mail, online retail sales, discussion boards, weblogs, online banking, and more. One web application can be accessed and used by millions of people.

Like desktop applications, web applications are made up of many parts and often contain mini programs, some of which have user interfaces, and some of which do not require a Graphical User Interface at all. In addition, web applications frequently require an additional markup or scripting language, such as HTML, CSS, or JavaScript programming language [8]–[10]. Also, many applications use only the Java programming language, which is ideal because of its versatility.

Internet technology has emerged as a very economical and viable option for the information exchange and knowledge sharing irrespective of time and physical boundaries. But with the implementation of the technology we also face certain implications of technological advantage. With the exposure to the untapped and on filtered information also expose our candidates to some unwanted information and exchange. With the expansion of the web technology many recruiters have come forward to make use of the mighty web to expand the recruiting approach and widen the effectiveness of employment system. During this many of us have encountered various challenges.

3.3   WAMP Server

WAMP Server is a web server using windows web development environment. It allows creating web applications with Apache, PHP and the MySQL database. It also comes with PHPMyAdmin and SQLite to easily manage databases[11]. WampServer is an open source project, free to use. WAMP is available for both, 32-bit and 64-bit operating system. There are add-ons available which can easily be plugged into WAMP. WAMP is widely used and relied upon for local development or as a ready-to-deploy server. The ease of installation, configuration and management of WAMP has played a vital role in its worldwide popularity.

3.4   MySQL

MySQL is an open-source relational database system[12]. It is a client/server system that consists of a multi thread SQL server that supports different backbends, several different client programs and libraries, administrative tools, and a wide range of application programming interfaces. MySQL is faster, more reliable and cheaper database system better than any other database system[13].

3.5   Apache Server

The Apache HTTP Server is mostly known as apache is an established standard in the online distribution of website services, which gave the initial boost for the expansion of the World Wide Web. It is an open-source web server platform.

3.6   PHP

PHP is a server-side scripting language designed for web development but also used as a general-purpose programming language[14]. PHP is free software released under the GPL License.   PHP originally called Personal Home Page but now called PHP Hypertext Preprocessor. PHP is an open source server side scripting language with embedded with HTML. It is used to create dynamic web pages. PHP is originally created by Rasmus Lerdorf in 1994 and current major version is PHP5.

PHP programming language has many advantages such as

- PHP is embedded with HTML through PHP special tags there for developers can used both HTML codes and PHP codes in one interface. Its helps to reduces number of codes in HTML.
- PHP codes are executed on the server therefore, client cannot see the PHP source code.
- PHP can communicate through network by using IMAP, SNMP, NNTP, POP3, HTTP.
- PHP is high performance language that can save millions of hits per day by using single inexpensive server.
- PHP provide interfaces to integrate many database systems apart for MySQL such as Oracle, PostgreSql, etc; in addition using ODBC user can connect any other databases that support ODBC driver. Therefore, Microsoft products also used in PHP.
- PHP have many built in libraries that help to performing many web related activates. Such as send emails, generate PDF documents, etc.

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- PHP can download by free of charge.

- PHP is easy to learn.

- PHP is strong object oriented support language.

- PHP support many operating systems therefore, any application written in PHP works many operating systems without any modification.

- PHP source code freely available therefore developers modify or add to the language.

Consider above advantages this research used PHP scripting language for develop the web base Circulation System.

3.7   Tool used for Development Ozeki Message Server

Ozeki Message Server is a powerful and flexible SMS Gateway application that enables to send/receive SMS messages using mobile devices with server computer[15]. It has an easy-to-use user interface, and an excellent internal architecture. The application can use a GSM mobile phone attached to the PC with a phone-to-PC data cable or IP SMS technology to transmit and receive the messages. Ozeki Message Server works on Microsoft Windows operating systems. SMS Gateway System Architecture is shown in the Figure 3-1.
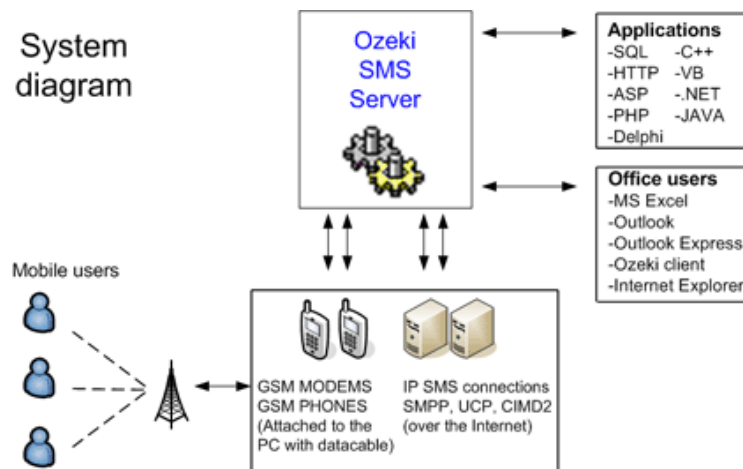

Figure 3-1 : SMS Gateway System Architecture

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3.8 Summary

Develop Real Time Recruitment System use PHP server side scripting language. MySQL RDBMS use for database and WAMP server use as web server. These tools are mostly open source and support to work in many operating systems. Next chapter describe approach for developing real time recruitment system.

Approach for Developing Real Time Recruitment System

4.1 Introduction

This chapter discussed about project development methodologies, why is this methodology selected, identifies project design strategies, describe that use case diagram, use case narrative and database design of the system. Also, explain that system architecture of the development.

4.2 Approach to the System

Real Time Recruitment System is an online website in which jobseekers can register themselves online and apply for job and attend the exam. Real Time Recruitment System provides online help to the users all over the world. Using web recruitment systems like recruitment websites or jobsites also play a role in simplifying the recruitment process. Such websites have facilities where prospective candidates can upload their Curriculum Vitae's and apply for jobs suited to them. Such sites also make it possible for recruiters and companies to post their staffing requirements and view profiles of interested candidates. Earlier recruitment was done manually and it was all at a time consuming work. Now it is all possible in a fraction of second. It is all done online without much time consuming. Today's recruitment applications are designed to do a whole lot more than just reduce paperwork. They can make a significant contribution to a company's marketing and sales activity. Recruitment websites and software make possible for managers to access information that is crucial to managing their staff, which they can use for promotion decisions, payroll considerations and succession planning.

By introducing the system, it would directly engaged with throwing away the old dusted bundled of files stored in the office and will replace them with a brand new automated system which is having advanced features of managing the processes of recruitment system without filling the file racks. The pre-selection process can be tailored to individual companies' needs. This way, the company can sift and sort candidates who meet the exact needs. Not only does this save time and cost it also results in a better quality of candidate reaching the interview stage having already established they meet certain key criteria.

Automating the application process also gives a level playing field to all candidates - whether they come directly to the company's site, via a recruitment consultant or in response to a print advertisement. For many larger organizations, achieving consistency of handling candidates across many branches or regional offices can be a problem: online recruitment solves it.

Software development life cycle (SDLC) is a process that used in software project[16]. This the full detail plan for system development stages such as planning, defining, designing, building, testing and deployment. SDLC helps to improve overall quality of the software as well as process of the development process. Currently software industry used several SDLC models such as Waterfall model, Iterative model, Spiral Model, Agile Model and RAD Model etc.

4.2.1 Overview of the System

There is a brief analysis of the entire system. User friendly Real Time Recruitment System and customizable reporting tools allows tracking data, analyzing trends and opportunities and reporting employee, job seeker information easily and accurately.

Users of the System
- Administrator

Administrator has the full authority over the website. He can view all the registered users and have the power to delete them. He can edit the web pages and update them. He can view all the company details also.

- Job Seeker

A jobseeker can register himself. After registration, he will be directed to his homepage. Here he can update his profile, change password and see the vacancy details and all.

- Employer

A company can register itself, approve or disapprove candidates who applied for a vacancy and provide results about the selected candidates

Inputs of the System

- Employer details
- Job Seeker Details
- Required Qualifications Details
- Required Experience Details
- Job Seeker Qualifications
- Job Seeker Experience
- Creating New Vacancies

Outputs of the System

- Profile Approval by the Administrator
- Job Seeker Profiles
- Company Profile (Employer Profiles)
- Current Vacancies
- Training Programs

Process - Job Seeker profile management process, Employer/ Organization profile management, Post Vacancies.

The Real Time Recruitment System runs on minimal hardware and software. The system runs entirely over the Internet, Therefore Company needs Internet facility also there are two main requirements as server side and client side. As sever side the system is built on reliable and secure technologies, with Apache server and language using PHP, database is MySQL.

Basic Features of the System

Once user categories are created, access to various modules is granted independent of other modules. Connection time outs and users being logged off the system are set at such durations so as to not interfere with daily operations.

Some basic features of the system with the technology that is used,

- Reduce 'dead time' in administration/process
- Make it easier for those staff involved in the recruitment processes
- System Administration and Management (Database Management System)
- Configurable - easily modified, add new features and easy setup to server.
- Development based on 3-tier architecture.
- Friendly, Flexible and Reliable.
- Secured access for all the modules.
- Easy access to recruitment-related information e.g. previous ads, previous candidates, job/role descriptions. Using web portal.
- On-line request form and automated approvals
- 'Live' web access to applications prior to the vacancy closing date, for all selection committee members;
- Easy, direct communication (email) with candidates;
- Ability to build specific applicant pools;
- On-line templates for recording all selection-related information;
- Cuts down turnaround times, eliminates duplication of effort
- Vacancy/candidate tracking.

Technology - Technologies adopted in developing the system is MySQL as the database developing tool, Dreamweaver as the web developing tool. And the programming language PHP links the database and the interfaces.

MySQL database is the world's most popular open source database because of its fast performance, high reliability, ease of use, and dramatic cost savings. MySQL is a popular choice of database for use in web applications, and is a central component of the widely used LAMP web application software stack—LAMP is an acronym for "Linux, Apache, MySQL, and PHP". Its popularity is closely tied to the popularity of PHP.

Dreamweaver can use third-party "Extensions" to extend core functionality of the application, which any web developer can write (largely in HTML and JavaScript). Dreamweaver is supported by a large community of extension developers who make extensions available (both commercial and free) for most web development tasks from simple rollover effects to full-featured shopping carts.

PHP is a general-purpose scripting language that is especially suited to server-side web development where PHP generally runs on a web server. Any PHP code in a requested file is executed by the PHP runtime, usually to create dynamic web page content. It can also be used for command-line scripting and client-side GUI applications. PHP can be deployed on most web servers, many operating systems and platforms, and can be used with many relational database management systems (RDBMS). It is available free of charge, and the PHP Group provides the complete source code for users to build, customize and extend for their own use. Further with the close relationship of PHP, MySQL and Dreamweaver, the new system was being easy to develop.

The waterfall model is a linear sequential development approach. It is very simple to understand and use[17]. In a waterfall model, each phase must be completed fully before the next phase can begin. At the end of each phase, a review takes place to determine if the

project is on the right path and whether or not to continue or discard the project. In waterfall model phases do not overlap. The structure of the Waterfall model is shown in the Figure 3-1.
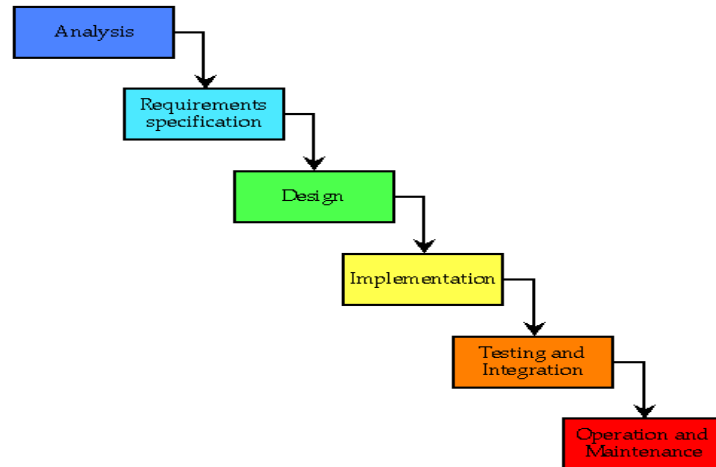

Figure 4-1 : Structure of the waterfall Model.

4.2.2   Prototyping Model

This prototype is developed based on the currently known requirements[18]. By using this prototype, the client can get an "actual feel" of the system, since the interactions with a prototype can enable the client to better understand the requirements of the desired system. Prototyping is an attractive idea for complicated and large systems for which there is no manual process or existing system to help determining the requirements. The prototypes are usually not complete systems and many of the details are not built on the prototype. The goal is to provide a system with overall functionality.

4.2.3   Choose the Development Method

Considering about all the Software development methodologies with advantages and disadvantages concluded that, prototyping model is used for development of the project. The reason for selecting Prototyping Model was due to the following:

- The Prototype Model eliminates the limitation and the shortcomings of the Waterfall Method.
- Projects with greater risks use the Spiral Development Model which can be called a combination of both the Waterfall and Incremental Method.
- Prototypes are flexible because the development process involves users and greatly assist in identifying what is exactly required. A popular well-recommended effective method which greatly helps to understand requirements facilitating development through interaction between user and developer and is not complicated.
- Using an iterative enhancement method the software was developed in increments, each increment adding some functional capability into the system, until the full system was implemented. Design modifications and extensions were done at each stage.
- Web-based systems are mainly developed by using this methodology.

4.3 Summary

With using of Searching methods, web based accessed and the online automated printing techniques, the system will be developed further. In conclusion this is a single interface to every requirements of a recruitment system. We can Use the organization's reputation, product image, online technology and other methods to draw as many potential applicants as possible to the organization's website. There organizations can present themselves employing sophisticated, standardized online tests to screen candidates, and to winnow the applicant pool to a manageable number. Using automated hiring management systems to contact the most desirable candidates very quickly, before they are snapped up by another

company making the phone call, setting up the meeting and shaking hands. The following section analyses the Design of the system.

Analysis and Design

5.1   Introduction

Previous chapter discussed about how various technologies that mention in chapter 3 such as PHP, My SQL etc. uses for solve the research problem. Design details of the propose system describe in this chapter. The most creative and challenging face of the system development is system design. It provides the understanding and procedural details necessary for the logical and physical stages of development.

5.2   System Analysis and Design

The system was developed by using prototyping model where the core modules were developed first and then the other modules added. So that selected requirement of the proposed system is allocated for suitable subsystems, after the analyzing.

The system is divided by five subsystems to prototyping development. There are Login Management Module, User Management Module, System and Administration Management Module, Job Management Module, Report Management Module.

Following key features are included that these modules.

Login Management Module

- Single Sign On user login at same login form for all users
- Reset their forgotten password using email notification or either login to the web portal.

User Management Module

- Visitors can be registered to system employer or either candidate using different registration form.
- Candidates can be create/update profile by uploading current word document.
- Employers can be updated company profile, company logo and contact person's details.
- Administrators can be verified user registration and also removed and modified user accounts.

Job Management Module

- Employers can be posted job vacancies.
- When post job employer can view suggest candidate by automatically compare.
- Employers can be done any modification of the job advertisement.
- Administrators are verified or rejected job vacancies.
- Administrator can be done any modification posted job vacancies.
- Visitors or Candidate can be search job by title, category and job type, city of vacancy place or company name.
- Candidate can be saved job details.
- Candidate can be printed job details.
- Candidate can send job details to friends.
- Candidate can be applied job online.
- The employer can be viewed candidate's profile who applied their job.
- Send SMS job information alerts from the system.
- Detected to reply SMS sending by the user and processed candidate requirement of the system.

Report Management Module

- The employer can be generated applicants summary reports for their job
- An administrator can be generated user detail or any other requirements detail of a given time period.

System and Administration Management Module

- System configuration
- An administrator can be entered master data in the system.

Data analysis module work flow

Before analysis candidate's profile candidate/ user should create user profile with this system create database recodes. Then candidate has function to upload cv in .doc format. Then system read document and extract data from file and save on MySQL database. As well as candidate has function for upload/modify profile anytime depend on his/her requirements.

5.3 Use-Case Diagrams

Main two components of the use case diagram are use case and actors. Use case diagram describe about identifying actors and use cases in the system. Users of the system called as actors. Also external parties of the system are called as Actors. Use-case use to describe of the behavior of the system. Use case scenarios are identified the interaction between users and the system. The Real Time Recruitment System divided by five subsystems (modules) and these subsystem's use case diagrams are given below.
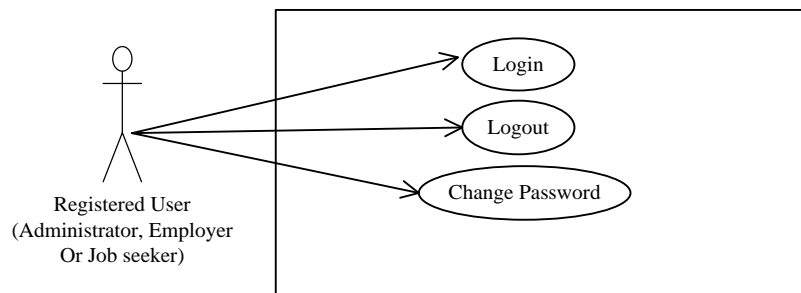
Figure 5-1 : Use Case Diagram of Login Management Module

Use Case Diagram of User Management Module

User Management Module has four actors. There are administrator, employer, candidate and visitor. The visitor is un-registered user in the system. Other users are registered user in the system. This system develops SSO method. Because of that, user accessibility is

increased bottom to top. The use cases of lower level users can be done by upper level users. Use case of user management module is shown in Figure 5-2.
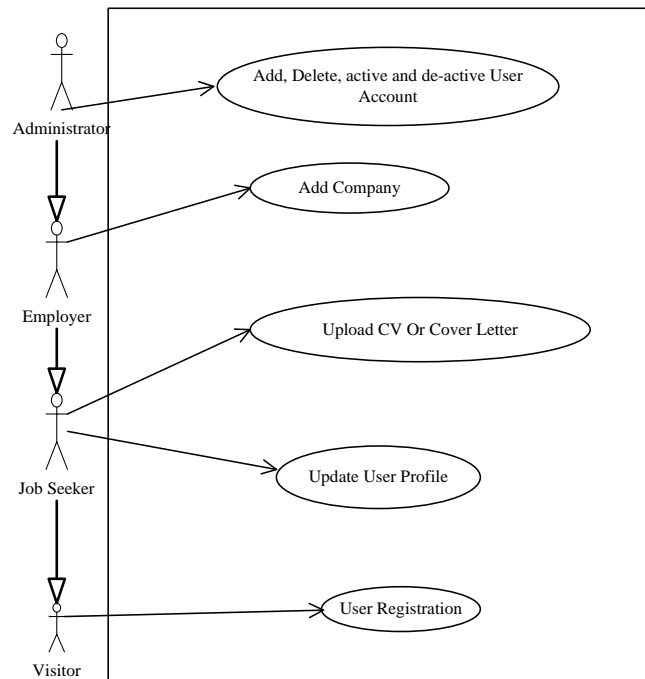

Figure 5-2 : Use Case Diagram of User Management Module

Use case Diagram of Job Management Module

Job management module has four actors. These actors are same as user management module. Also process of this module same as user management module. Use case of job management module is shown in Figure 5-3.
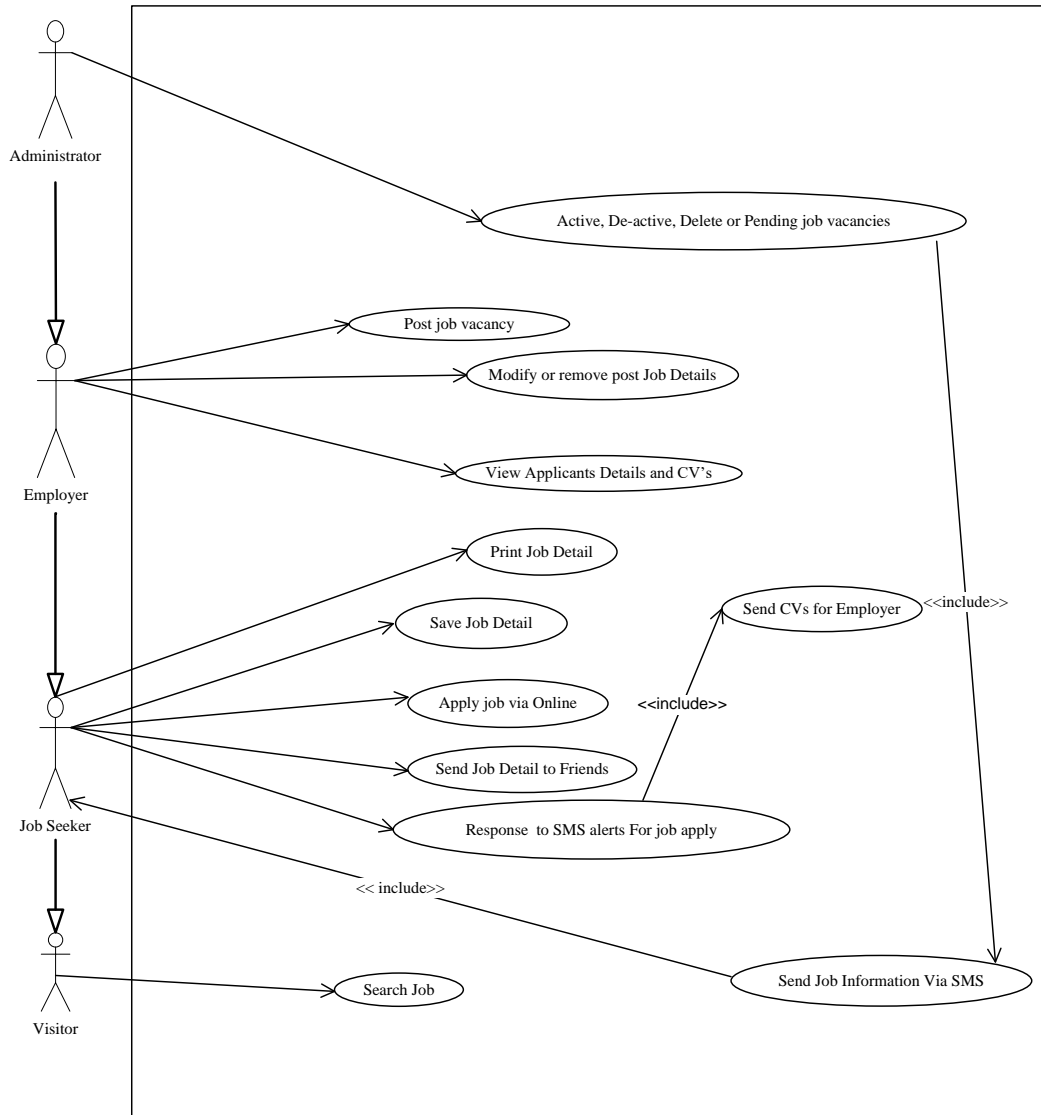
Figure 5-3 : Use case Diagram of Job Management Module

Use case Diagram of Report Management Module

Report management module has two actors. There are administrator and employer. Report generation is the main process of this module. Use case of report management module is shown in Figure 5-4.
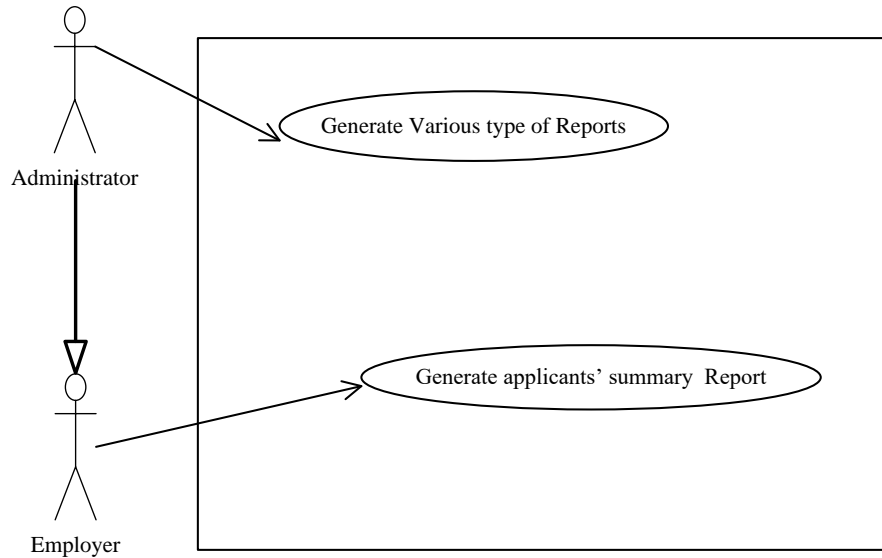
Figure 5-4 : Use Case Diagram of Report Management Module

Use Case Diagram of System and Administration Management Module

An administrator is the one and only actor in the system of this module. System configuration and other main data entries are done by this actor. Use case of this module is shown in Figure 5-5.
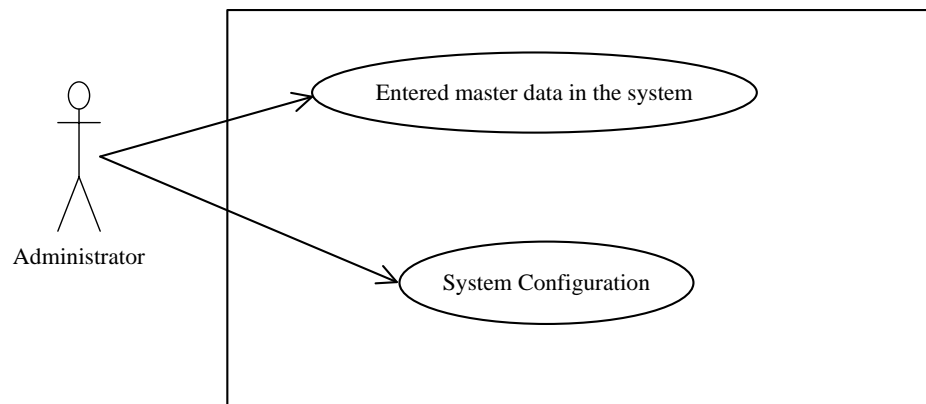
Figure 5-5 : Use case Diagram of System and Administration Management Module

From the above use-case diagrams, following use-cases are listed down in the Table 5-1.

Class of Use-Case	ID	Use-Cases	Description of Use-Cases
Use-case related to the Login Management	1	Login	Login to the System by users
	2	Logout	Logout to the System by login users
	3	Change Password	Changed Password by system Registered user
Use-case related to User Management	4	User registration	Create a new user Account by Visitors or Administrator
	5	Update profile	Update user information by Candidate, Employer or Administrator.
	6	Upload CV or Cover Letter	Upload CV or Cover Letter by Candidate.
	7	User account verification, modification or removing.	User account's status active, de-active, deleted or modified by the Administrator
	8	Add New Company	Add new company Employer or Administrator
Use-case relate to Job Management	9	Post job vacancy	Post Job vacancy by Employer or Administrator
	10	Modification of job vacancy	Modified post job details or extended closing date by Employer or Administrator

	11	Verified or reject job vacancies	Job vacancie's status active, de-active, deleted or modified by the Administrator
	12	Search Job	Search job information different method by visitor or Candidate
	13	Apply to job via online	Apply job through Online by Candidate
	14	Save Job details	Save Job details by Online by Candidate
	15	Print job details	Print job details by Online by Candidate
	16	Send job detail for friends	Send job detail by Online by Candidate
	17	Send SMS alerts	Send SMS alerts from the system
	18	Respond SMS alert	Respond to the SMS alert for applying to job by the job - seeker
Use-case relate to Report Management	19	Generate Reports	Generate varies report by Employer or Administrator
Use-case relate to System And Administration Management	20	System Configuration	System configuration from backend by the Administrator
	21	Enter master data to the system	Enter master data into the system from backend.

Table 5-1 : List of Use-Cases

5.4   Use Case Narratives

From the above list of use-case in the Table 5-2: Use Case Narrative - User account verification are related to some functional requirements described in following narrative cases. Use-case narrative provides an in-depth description about the use-case of the system designer.

Use-case narrative of User account verification

After User registered as an Employer or a Candidate, user account creates a pending mode. Like this account, the administrator must change status active or reject. The user can access their, whole privileges related to user type.

Use Case ID	6
Use Case Name	User account verification
Primary Actor	Administrator
Pre-Condition	Employer or Candidate must be registered to the system and created account must be a pending mode.
Main scenario	The administrator selects an account status is accepted or rejected. Preview status changes System database is updated accordingly
Post Condition	Employer and Candidate can update profile. The employer can post jobs vacancies. Candidate can save job, print job detail, activate SMS Alerts, send job detail to a friend.

Table 5-2: Use Case Narrative - User account verification

Use case narrative of Add New Company

After User registered as an Employer and employer's account is activated then employer can add new companies to system. Also, Administrator can add new companies to system.

Use Case ID	8
Use Case Name	Add New Company
Primary Actor	Employer, Administrator
Pre-Condition	Employer must be login to the system and employer's account must activate or Administrator must be login to the system.
Main scenario	Click Add Company button. Fill requested data and Click Register Button New Company added to database.
Post Condition	Employer or Administrator can post job vacancies of added company.

Table 5-3: Use Case Narratives – Add New Company

Use case narrative of Search Job

Any user can search job vacancies using job title, job category, job type or vacancy placed in the city. The system is filtered data using search option and result job vacancies are displayed.

Use Case ID	12
Use Case Name	Search Job
Primary Actor	Visitors, Candidate
Pre-Condition	-

	The user selects search type of job details. (The user can be search jobs by title or by category or by job type, by city of vacancy is placed or by the company name.)
Main scenario	Insert selected type data in the text box or select data in the combo box.
	Web portal display filtered results.
Post Condition	If users are logged into the system can apply to jobs or Save job or Print job details or send details to friends.

Table 5-4: Use-Case Narratives - Search Job

Use case narrative of sending SMS alerts

If Candidate activated SMS alert in the system then, the system is checked by user preferred job category are matched with the added job vacancy category. If there are matches with each other send a job alert to Candidate.

Use Case ID	17
Use Case Name	Send SMS alerts
Primary Actor	System
Pre-Condition	Candidate must be activated job alert system. The administrator must set activate the job vacancy. Candidate must be updated seeking job category preferred
Main scenario	System match job category with user preference. Job categories are matched then check SMS alerts are activated. SMS alerts activated then Auto generated SMS alert with job information send by the system.

Post Condition	Candidate can apply to jobs, responded by SMS

<div align="center">Table 5-5: Use case Narratives - Send SMS alerts</div>

5.5   Sequence Diagrams

Sequence diagrams are represented that, how process operate with one another and in what order. Following diagrams show that, sequence diagram of main modules in the development.

Sequence Diagram of User Management Module

Sequence Diagram of User Management Module is shown in Figure 5-6 : Sequence Diagram for User Management Module.
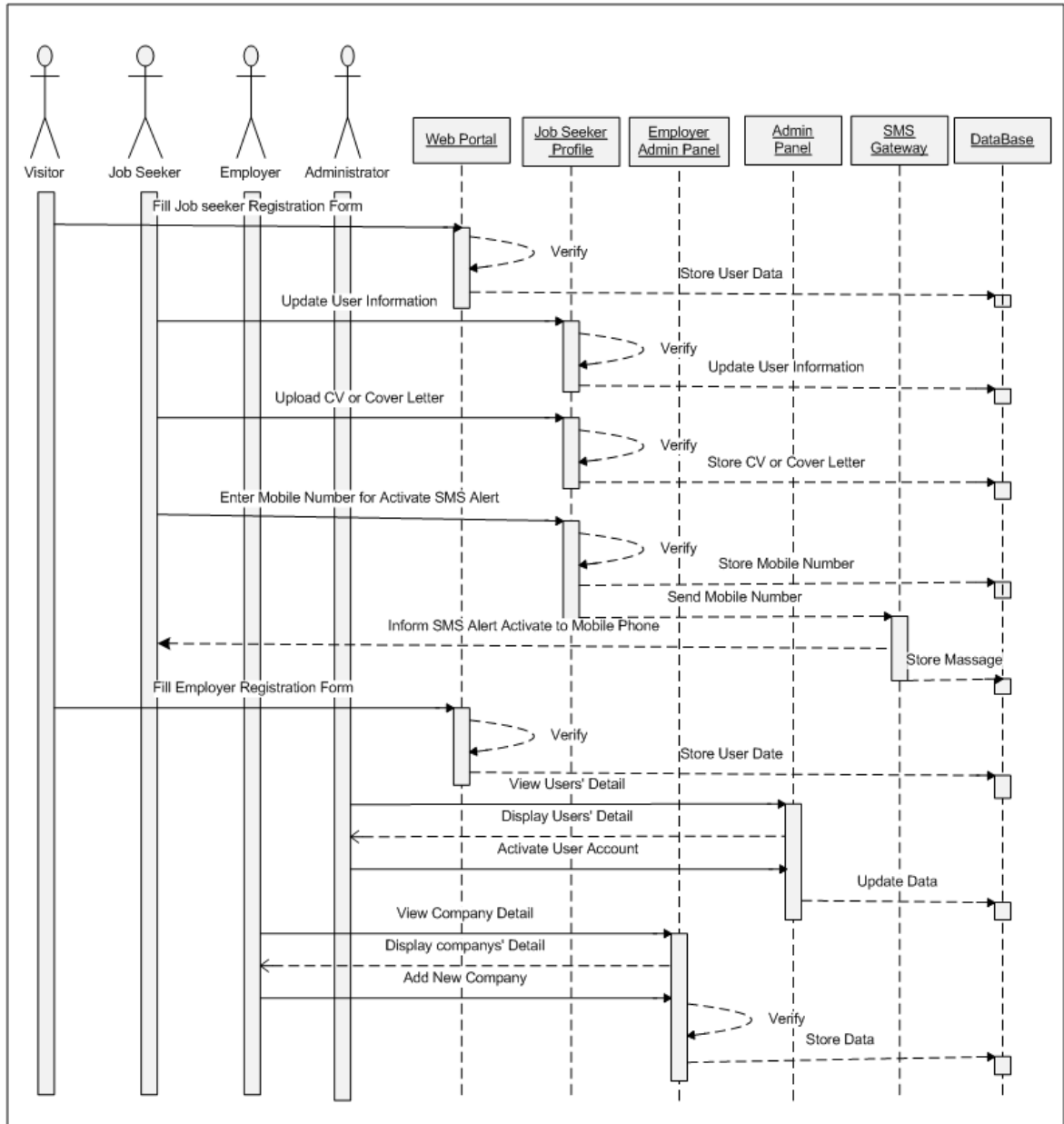
Figure 5-6 : Sequence Diagram for User Management Module

Sequence Diagram Job Management

Module Sequence Diagram of Job Management Module is shown in Figure 5-7 : Sequence

Diagram for Job Management Module.
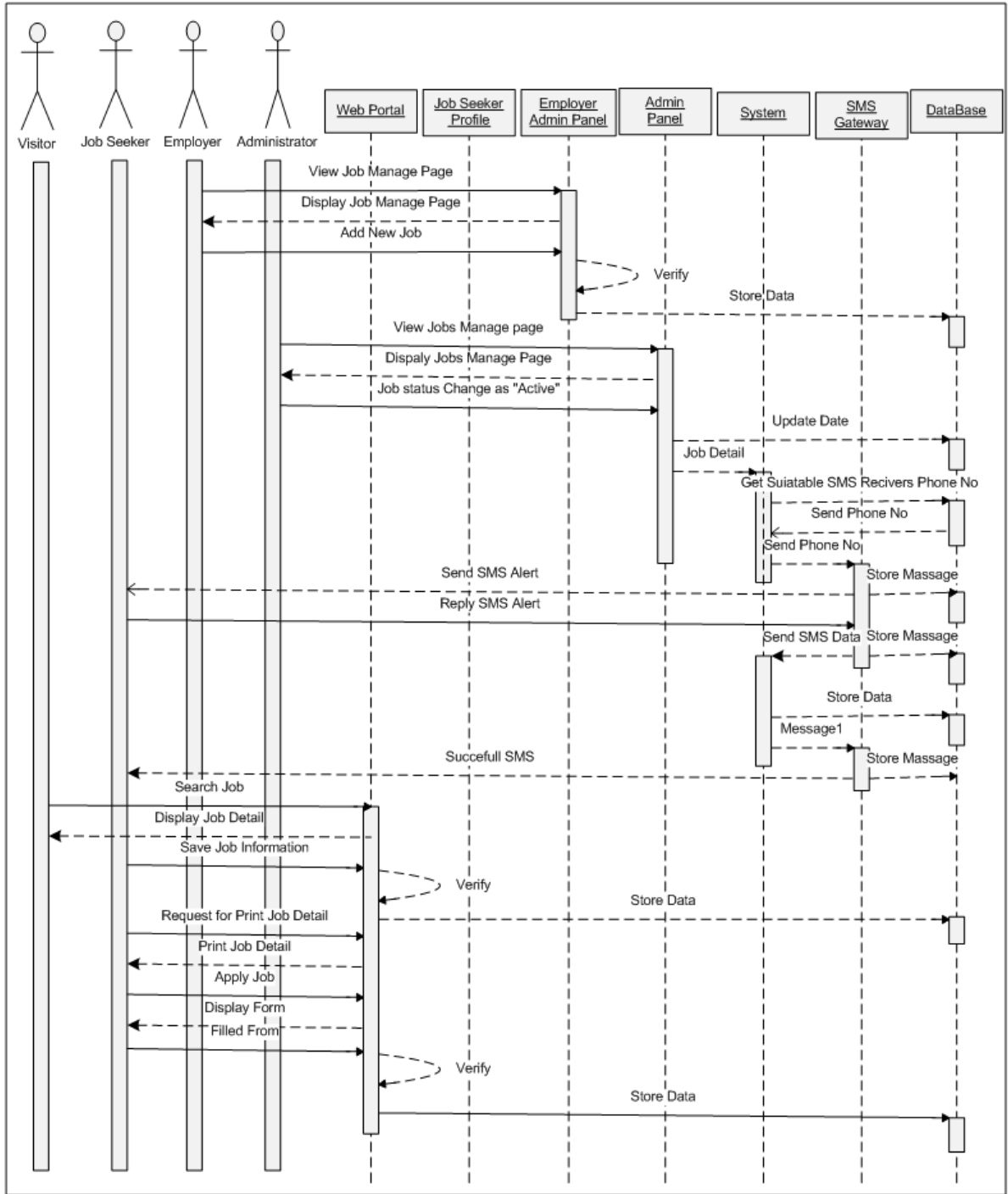
Figure 5-7 : Sequence Diagram for Job Management Module

5.6   Database Structures

Database design is most important part of the software development. In this development, database structure is represented after dividing to subsystem. Following diagrams show that, database structures of main modules.

Database Structure of Login Management Module

Login Management Module process is related four tables in the database. Figure 5-8 : Database Structure of Login Management Module is shown that Database Structures of Login Management Module.
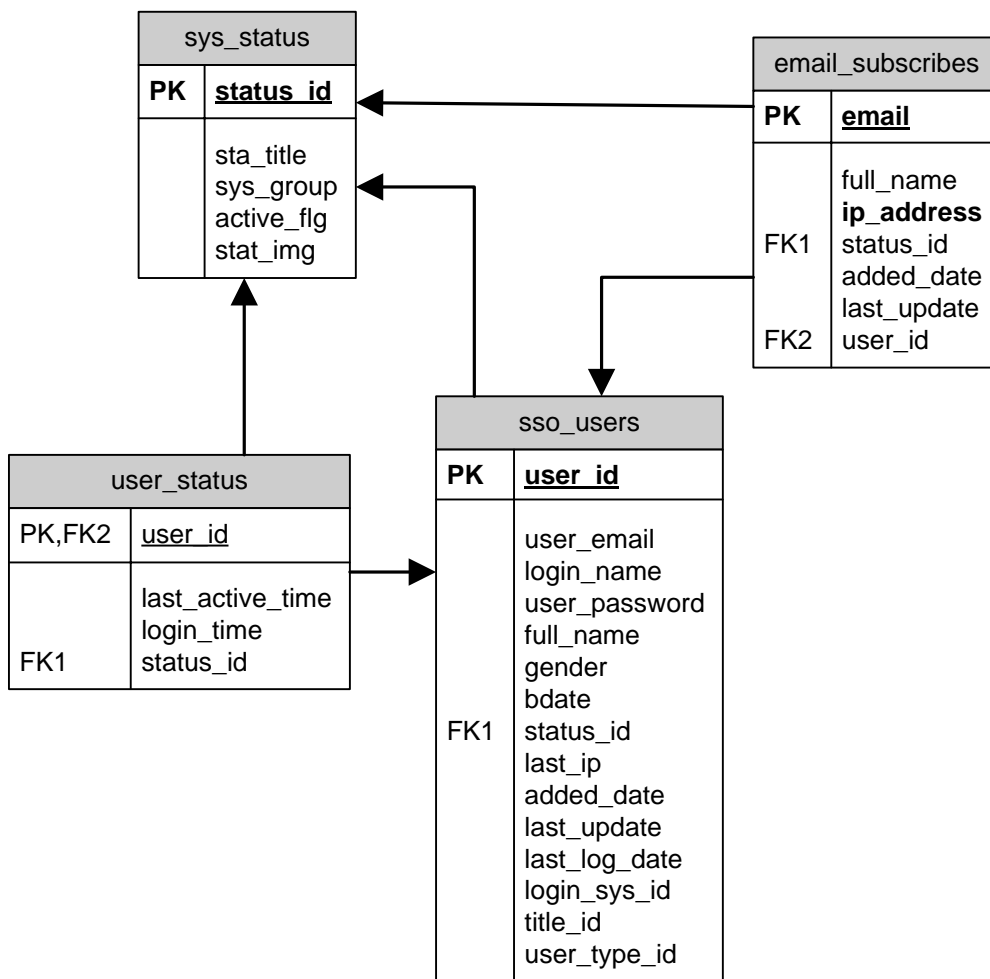
Figure 5-8 : Database Structure of Login Management Module

Database Structure of User Management Module

User Management Module is related database structure is shown in Figure 5-9 : Database Structure of User Management Module.
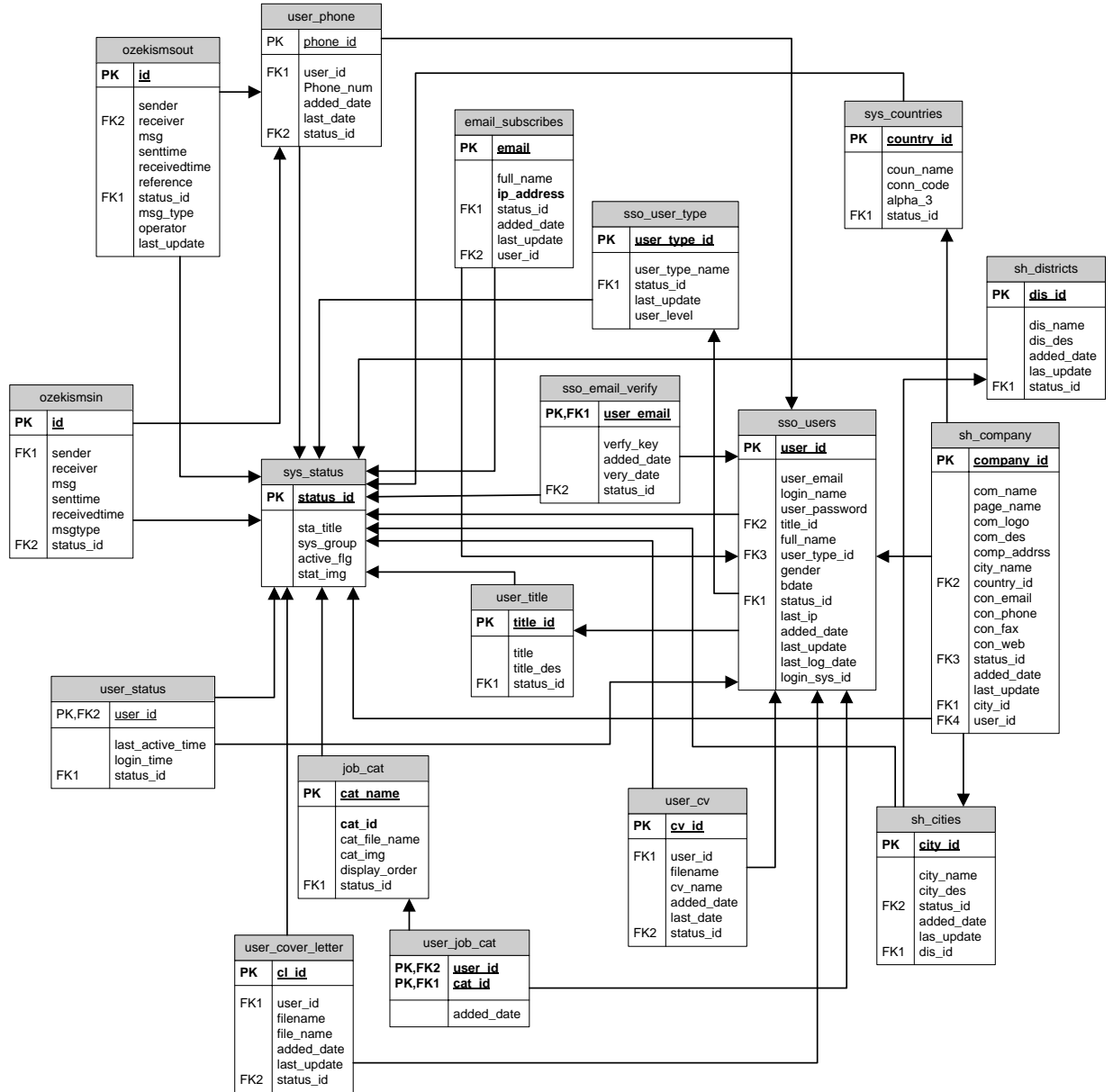
Figure 5-9 : Database Structure of User Management Module

Database Structure of Job Management Module

Job Management Module is related database structure is shown in Figure 5-10 : Database Structure of Job Management Module.

Figure 5-10 : Database Structure of Job Management Module

42
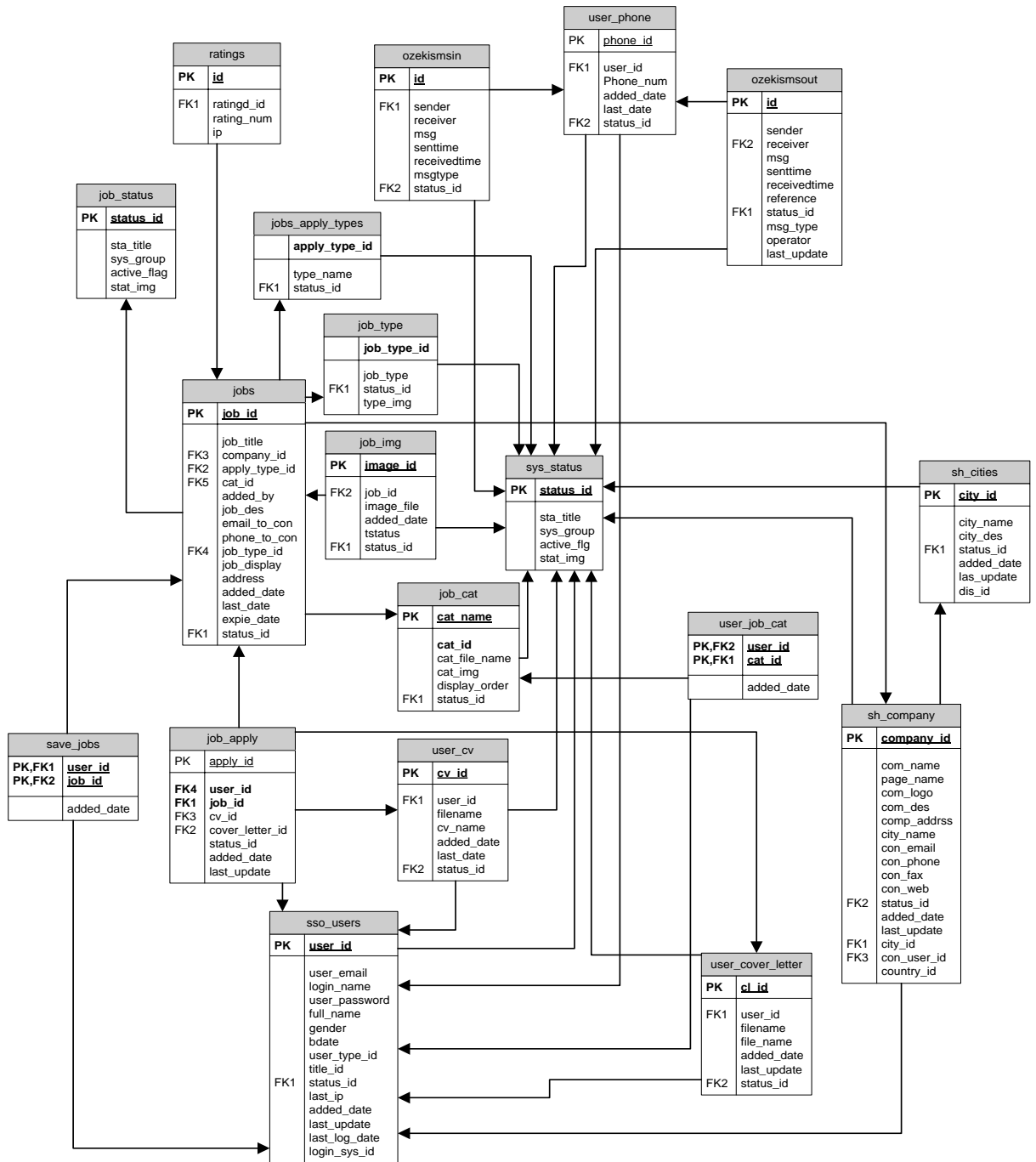
Considering above database structure diagrams, some tables are included all of the database structures. Also, some of tables are not included above diagram. These tables are not related to sub system. But there are important for whole process of the system.

5.7   Summary

This system is designed for better interaction between Candidates and Employers. This software very gracefully handles all the requirements for easy Online Recruitment management.

The Online Recruitment System being web based can be accessed from anywhere in the world, which enables the Candidates and the Organization be in touch with each other at all times.

Implementation

6.1 Introduction

Previous chapter consider about details of design of the propose solution. This chapter discussed about details related to the implementation of the solution.

6.2 Overview of the system

This section briefly overview the system interfaces and algorithms used in the system for analyze candidate's profile data via uploading by .pdf or .doc files.

6.3 Algorithms used for analyze candidate data

After company upload/add job as their requirement then system ask to file some description about job, According to those requirement system analysis user profile and return most suitable candidate using following steps as data analysis method.

1. At beginning user uploaded CV Convert text to UTF-8. Because otherwise analysis is very hard because there are some tags such as html.
2. Filter text using main skill, requirement such as age limit.
3. Split doc file into words and load.
4. Remove two character words and stop words and special characters such as "@,~,`,#,$,%,^,&,*,(,),_,-,<,>,?,:,;,",',{,[,},],|,\
5. Determine word frequency with density.
6. Determine word prominence.
7. Determine word containers with Title, meta, URL, Headings, Meta keys
8. Calculate key word value and save in MySQL database for next analysis.

$analKeysArray = array();

foreach($uniqueWordCounts as $uniqWordsAnal1 => $frequency){

```
$density = $frequency / count ($words) * 100;

$keys = array_keys ($words, $word); // $word is the word we're currently at in the
loop

$positionSum = array_sum ($keys) + count ($keys);

$prominence = (count ($words) - (($positionSum - 1) / count ($keys))) * (100 /
count ($words));

$keyValue = (double) ((1 + $density) * ($prominence / 10)) * (1 + (0.5 * count
($containers)));

$tempArray1 = array('key'=>$uniqWordsAnal1,

                                'frequency'=>$frequency,

                                'density'=>$density,

                                'positionSum'=>$positionSum,

                                'prominence'=>$prominence,

                                'keyValue'=>$keyValue);


array_push($analKeysArray,$tempArray1);

}
```

6.4   The main web Interface of the system

In this section describe about the user interface of developing web portal.

Home Page

Real Time Recruitment System home page is shown in the Figure 6-1. Any user can access
this home page and search job. User can login to the web portal through here .Visitors can
register to the web portal through a home page. Facebook Plug-in is inserted in home page.

Figure 6-1 : Home Page

Login Form

User Login Form is shown in the Figure 6-2. Administrator, Employer, Candidate accessed same Login form login to the web portal. Registered user entered their email and password to login to the web portal. Also, user forgotten their password then they can reset using "Forgot Password" Link.

Figure 6-2 : Login Form

Employer Registration Form

The employer registration form is shown in the Figure 6-3 : Employer Register Form. Using this form visitors can register as an employer. Data validation was available this page.

Employer Register

Company Details

Company Name

[   ] *

Company Descrption

[   ]
[   ] *

Email

[   ]

Web Address

[   ]

Company Address

[   ] *

Phone Number

[   ] *

Fax number

[   ]

Company logo

[Browse...] No file selected.

Not readable? Change text.

[   ] *

Agree to Terms and Conditions

☐ * I agree to the Terms and Conditions.

[**Register**]

Contact Person's Details

First Name

[   ] *

Second Name

[   ] *

E-mail

[   ] *

Password

[   ] *

Confirm Password

[   ] *

Gender

[gender ▾] *

Date of Birth

[dd ▾] [mmm ▾] [yyyy ▾] *

Figure 6-3 : Employer Register Form

Candidate Registration Form

Candidate registration form is shown in the Figure 6-4 : Candidate Register Form. Using this form visitors can register as a job - seeker. Data validation was available this page.

Figure 6-4 : Candidate Register Form

After successfully fill above for your will receive email to confirm his/her email address. Then user need to click on link in the email to activate account.

Candidate Home Page

After activate user account user can login to his/her account using email address and password. Candidate home page is like Figure 6-5 : Candidate Home Page.
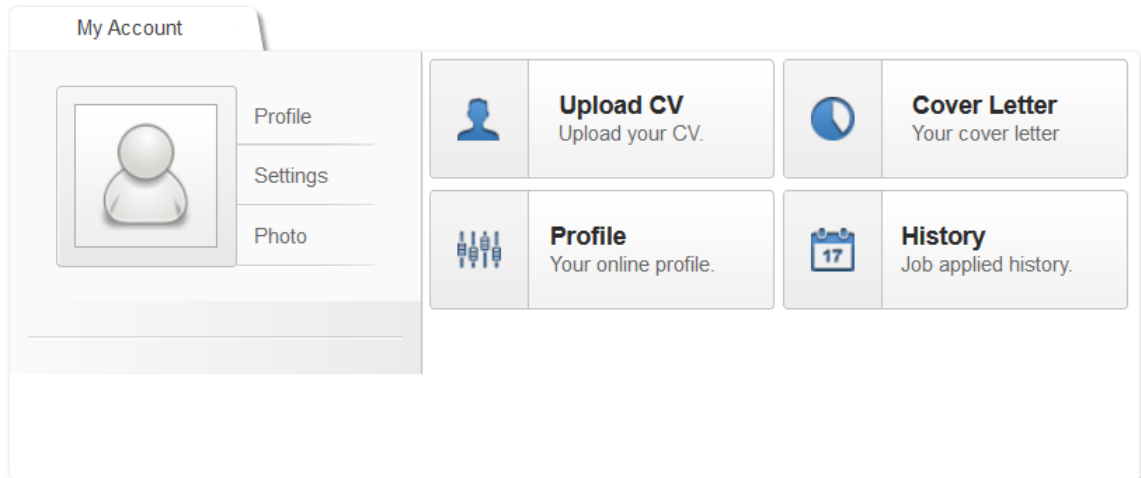
Figure 6-5 : Candidate Home Page

Using above interface candidate can create profile, create cover letter, update profile and view old job list that candidate applied. Using "Upload CV" module or at first time click on "Profile" buttons candidate receive pop-up box for upload candidate's resume file. It allowed only .doc,.docx, .pdf or .odt files only. If candidate upload .doc file, Real Time Recruitment System automatically read whole file and analyzed and generate full profile or summary for create candidate profile. Then candidate not need to fill lot of forms to create candidate profile on Real Time Recruitment System. Also here is function for update candidate profile before save. Using drag and prop candidate can re arrange his profile as he need. Moreover Real Time Recruitment System analyze candidate profile and give ranking number according to contend on his profile. That help to employer to select and categorized candidates on job application processing stage.

6.5   Summary

Complete implementation of the system will deliver a wide range of benefits to the Community, and importantly for those staff involved in conducting the recruitment processes in an organization. The HR Recruitment & Benefits Officers will take a very 'hands on, just-in-time' approach to training and coaching staff in the optimal use of the system. It is anticipated that this approach will be more relevant for the user. In addition to an intuitive design, look & feel, the system will have tutorials and other on-line help that is concise and informative.

Conclusion & Future Work

In the previous chapter discuss about testing phase and user evaluation of the system. In this chapter discuss about summarization of whole the project development and documentation. These are included about the conclusion of the project work, lessons learned from the project and future enhancement of the system.

7.1   Lessons learned from the project

Developing the system under a different programming language and a different methodology, gave me the opportunity to have a good learning experience. It paved the way to use the theoretical knowledge we had gained into practice in the real world.

During the process of this development, need to gather information various ways. Carrying out surveys and analyzing results, carrying out a requirement analysis for a project and doing a competitor analysis. Also, gather information about open source tools to develop a web portal.

Installing WAMP server on windows platform and using open source other tools implement a new web portal. I had to refer several tutorials before the implement system. Also, I had to learn the open source programming language PHP and MySQL database management system before coming to the implementation phase of the project. Testing and evaluation phase of the project, I had to collect more experience in my life. There was a good opportunity to understand and get practical experience, how to develop project successfully.

7.2   Future Work

After the user evaluation, it is identified that following module need to be developed as a future enhancement for the system.

7.2.1 Human Resource management Module

This Module able to be gives access facility for employers and their HR team. It is "Back-Office" to automate facility for the company. HRMM able to be manage interview process easily. Job seekers apply online directly to company with complete confidentiality. After that company will receive a job application immediately. The company can process interview using less paper printouts.

7.2.2 Mobile Accessibility

An online job board system able to be develops a mobile version for it. It will give access facility to website via mobile phone. If User has web accessibility mobile phone user can access to job board through a mobile phone.

7.3 Conclusion

This web based application was developed to candidates and employers in Sri Lanka. The main objective was to design Real Time Recruitment System to establish, real time access facility and reduce form fill for create candidate profiles. Also make easy and faster job application processes by creating fully automated application processing system. The system was designed to work under platform independently but in development did under Windows platform using the mini server WAMP. But it can work under any operating system. The system was coded using open source software. Calendar, Captcha, Color Box, Rating, PHP mailer and some other tool are used to develop systematically work properly. Ozeki Message Server was used to create SMS gateway. Also, payment gateway was configured that using PayPal Sandbox. After the development of the new system, it was tested to fine tune the codes, handle the errors of the system, and find out the system works

correctly. After the system was tested various group of users. They were appreciated the work and told all functionalities working properly. They were concluded that the system was user friendly and they could apply to job without access Internet always via SMS. It is concluded that the system is helping to minimize the expenditure of candidate and employer. So Real Time Recruitment System is efficient and cost effective system to candidate and employer. Finally it is concluded that, the project objective was successfully achieved.

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Appendixes

Appendix A –Use-case narrative of User Login

Use Case ID	1
Use Case Name	Login
Primary Actor	Administrator, Employer, Job seeker
Pre-Condition	The user must be registered to the system.
Main scenario	The user enters valid username and password System check username and password are match with user table. Both are correct users are logon to the system
Post Condition	A session is started The user can access user privileges according to user type.

Table Appendix A - 1: Use-Case Narrative -User Login

Use-case narrative of User Logout

Use Case ID	2
Use Case Name	Logout
Primary Actor	Administrator, Employer, Job-seeker
Pre-Condition	The user must be Login to the system.
Main scenario	Clicked on Sign Out
Post Condition	The session is closed The user can access to a web portal as a visitor

Table Appendix A - 2: Use-Case Narrative -User Logout

Use-case narrative of Change Password

Use Case ID	3.1
Use Case Name	Change Password
Primary Actor	Employer, Job seeker
Pre-Condition	The user must be Login to the system.
Main scenario	Enter New Password Twice

56

	The system is matched each other new password
	Change password.
Post Condition	The session is continued.
	The user can access to a web portal

<p align="center">Table Appendix A - 3: Use-Case Narrative-Change Password</p>

Use-case narrative of Change Forgotten Password

Use Case ID	3.2
Use Case Name	Change Password
Primary Actor	Employer, Job seeker
Pre-Condition	The user must be activated email address
Main scenario	Enter a valid email address and Security code.
	The system is checked that, email address in the user table.
	The system is checked security code is valid.
	The system sends an email with generated password and updated the current user password to new generated code.
Post Condition	User can login to email and see new password.
	User can login to the web portal.
	The user can access to a web portal

<p align="center">Table Appendix A - 4: Use-Case Narrative-Change Forgotten Password</p>

Use-case narrative of User Registration

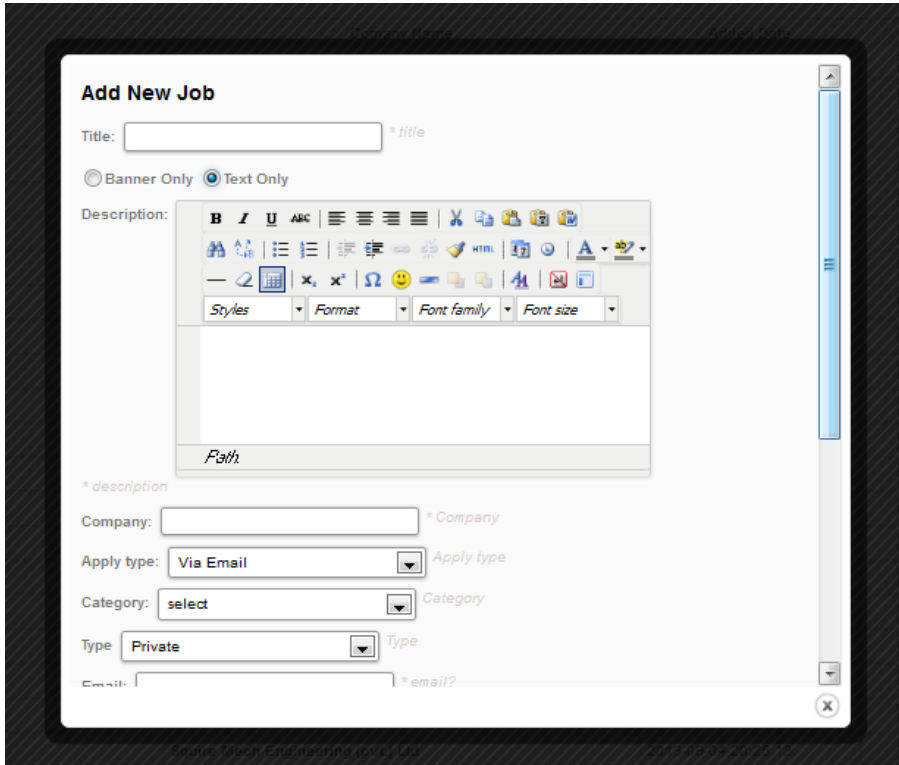| Use Case ID	4
Use Case Name	User registration
Primary Actor	Visitor
Pre-Condition	-
Main scenario	Register as an Employer select Employer registration form or either registers as a Job - seeker select a Job seeker registration form.
	Fill all required fields correctly in a form and enter the security code.

Post Condition	The session started

Table Appendix A - 5: Use-Case Narrative- User Registration

Appendix B – Interfaces

Add New Job

Add New Job user interface is shown in the Figure Appendix B-1. Using this screen administrator and Employer can create new job vacancies.

Figure Appendix B - 1: Add New Job Form

Search Job Vacancies by different filtering method

The user can search job vacancies by using job title, Categories, Job type or city of place. After filtering job list was shown in the web page. This part is included in the home page of web Portal.

Figure Appendix B -2 : View Job Vacancy Search Bar

Search Job Vacancies by Job Category

This Screen shot is shown that, filtered job vacancies by job category. Also, Figure Appendix B-3 is clearly shown that, users are voted to job vacancies.
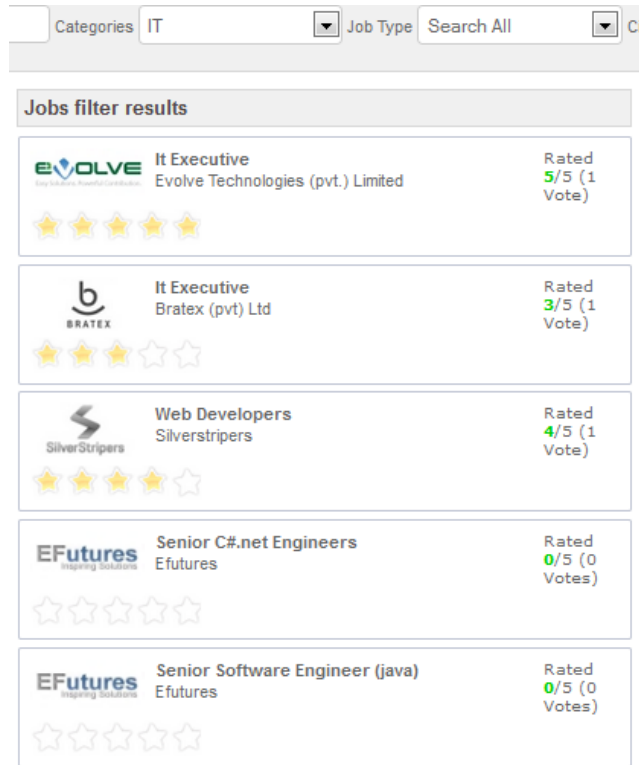
Figure Appendix B -3: Search Job Vacancies by Job Category

View Job Vacancy with Detail

User can view job descriptions after clicked on any job vacancies on the list. It is shown in Figure Appendix B-4.
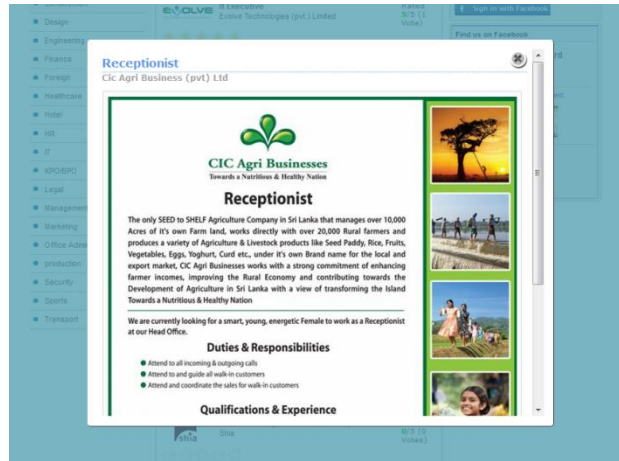
Figure Appendix B -4: View Job Vacancy with Detail

Registered Employer List

In the Figure Appendix B-5 is shown that registered employer list in the web portal. The user clicked on any company logo then user can views company description and their active job vacancy list. It is shown in Figure Appendix B-6.

Figure Appendix B -5: Registered Employer List

Jat Holdings (pvt) Ltd

About Jat Holdings (pvt) Ltd

> Company Location: No: 351, Pannipitiya Road,,Thalawathugoda

jat holdings (pvt) ltd was founded by mr. aelian gunawardene in 1993 with the primary objective of providing total solutions in timber coatings to the sri lankan furniture industry. wood coatings marketed by jat holdings are essentially derived out of 3 types of lacquer bases: nc-nitro cellular, pu-polyurethane, and wb-water based â€" from which customers may select lacquers specifically designed for either interior or exterior use.

> Company Phone: 0114407700
> Company Fax: 0112773793
> Company Web: http://www.jatholdings.com

Job Vacancies at Jat Holdings (pvt) Ltd

Job Title	Category	Added date	Closing Date
Customer Care Assistants	Marketing	2013-11-30 19:59:22	2013-12-31 13:24:00

Figure Appendix B -6: Selected Company Job Vacancy List

View of Administrator Back End

Figure Appendix B -7, Figure Appendix B -8, Figure Appendix B -9, Figure Appendix B -10 and Figure Appendix B- 11 are shown in the admin panel of the system. This is the back end of the administrator.

Figure Appendix B -7: Home of Administrator Back End

Online Job Board Admin Panel — Wonisha Hasamal | logout

User Manage
Dashboard » Home » User Manage »

#	User ID	User Name	User E-mail	Last IP	Added Date	Last Update	Last Login Date	User Type	Status
1	25	woo dana	ww@gmail.com	2014-01-21 04:48:14	2014-01-21 04:48:14	127.0.0.1	2014-01-21 04:48:14	Employee	Active
2	24	Woni Hasa	wonig@gmail.com	2014-01-21 04:32:45	2014-01-21 04:32:45	127.0.0.1	2014-01-21 04:32:45	Jobseeker	Active
3	21	Inosha Sandamal	inosha@gmail.com	2014-01-20 22:44:00	2014-01-20 22:44:07	0	2014-01-20 22:44:10	Employee	Active
4	23	Ganga Ganepola	ganga@gmail.com	2014-01-20 20:35:17	2014-01-20 20:35:17	0	2014-01-20 20:35:17	Employee	Active
5	22	Wimal Chandrasiri	wimal@gmail.com	2014-01-20 20:25:35	2014-01-20 20:25:35	127.0.0.1	2014-01-20 20:25:35	Jobseeker	Active
6	20	Nimalka Perera	nishamalmal@yahoo.com	2014-01-20 17:10:10	2014-01-20 17:10:10	0	2014-01-20 17:10:10	Jobseeker	Active
7	19	Nihal Alahakubura	nihal@gmail.com	2014-01-20 16:40:54	2014-01-20 16:40:54	0	2014-01-20 16:40:54	Employee	Active
8	18	Nisha Mal	nishamalmal@gmail.com	2014-01-20 16:19:37	2014-01-20 16:19:37	0	2014-01-20 16:19:37	Employee	Active
9	1	Wonisha Hasamal	wonishahasamal@gmail.com	2013-09-02 04:44:29	2013-09-11 04:44:29	0	2014-01-19 21:56:04	Administrator	Active

Figure Appendix B -8: User Management View of Administrator Back End

Online Job Board Admin Panel — Wonisha Hasamal | logout

Jobs Manage
Dashboard » Jobs » Jobs Manage »   Add new job

#	Title	Comany Name	Added Date	Expir Date	Last Update	Status
1	Accountant	Lalan Group	2013-11-27 23:49:41	2014-02-28 13:24	2014-01-16 02:39:28	Active
2	Customer Care Assistants	Jat Holdings (pvt) Ltd	2013-11-27 23:49:41	2014-02-28 13:24	2014-01-20 00:39:30	Deactive
3	Receptionist	Cic Agri Business (pvt) Ltd	2013-11-27 23:49:41	2014-02-28 13:24	2014-01-20 16:23:43	Active
4	Mechanic	Bratex (pvt) Ltd	2013-11-27 23:49:41	2014-02-28 13:24	2014-01-16 02:39:28	Deactive
5	Executive - Human Resources And Administration	Lalan Group	2013-11-27 23:49:41	2014-02-05 13:24	2014-01-20 00:31:29	Active
6	Account Assistant	Cosmetic Deny Private Ltd	2014-01-20 20:46:24	2014-02-03 20:45	2014-01-21 02:17:44	Active
7	Account Assistant	Siddhalepa	2014-01-20 17:35:58	2014-02-03 17:34	2014-01-20 23:15:15	Active
8	Store Keeper	Siddhalepa	2014-01-20 17:44:39	2014-02-01 17:36	2014-01-20 23:15:18	Active
9	It Excutive	Bratex (pvt) Ltd	2013-11-27 23:49:41	2014-01-15 14:22	2014-01-20 23:15:06	Active
10	Teacher	Bratex (pvt) Ltd	2014-01-21 04:40:30	1970-01-01 00:00	2014-01-21 10:11:00	Active

Figure Appendix B -9: Job Management View of Administrator Back End

Online Job Board Admin Panel — Wonisha Hasamal | logout

Companies
Dashboard » Companies »   Add Company

#	Company Name	City	Contact Persons	Phone	Email	Added Date	Last Update	Status
1	Siddhalepa	Gampaha	Inosha Sandamal	0335123123	siddha@slt.lk	2014-01-20 17:22:27	2014-01-20 23:57:36	Active
2	Abans (pvt) ltd	Colombo	Wonisha Hasamal	0112565265	hr@abansgroup.com	2013-10-25 22:04:53	2014-01-02 22:34:25	Active
3	Hayleys Group	Colombo	Wonisha Hasamal	112696331	info@cau.hayleys.com	2013-10-25 22:04:53	2014-01-19 17:13:41	Pending
4	John Keells Holdings Plc	Colombo	Wonisha Hasamal	0112306000	jkh@keells.com	2013-10-25 22:04:53	2014-01-02 22:34:25	Active
5	Singer (sri Lanka) Plc	Colombo	Wonisha Hasamal	0115400400	callcentre@singersl.com	2013-10-25 22:04:53	2014-01-19 17:11:09	Pending
6	David Pieris Information Technologies Ltd	Colombo	Wonisha Hasamal	0114700555	info@dpitl.com	2013-10-25 22:04:53	2014-01-19 17:10:18	Deleted
7	Cosmetic Dentistry Private Ltd	Dehiwala	Wonisha Hasamal	0115733308	manager@consmeticdentistrysl.com	2013-10-25 22:04:53	2014-01-02 22:34:25	Active
8	Cyber Concepts (pvt) Ltd	Dehiwala	Wonisha Hasamal	0112761734	ravi@cyberconceptslk.com	2013-10-25 22:04:53	2014-01-02 22:34:25	Active
9	The Finance Company Plc	Colombo 04	Wonisha Hasamal	0112580210	hrd@thefinance.lk	2013-10-25 22:04:53	2014-01-02 22:34:25	Active
10	Union Bank Of Colombo Plc	Colombo	Wonisha Hasamal	0112374100	job@unionb.com	2013-10-25 22:04:53	2014-01-02 22:34:25	Active

Figure Appendix B -10: Company Management View of Administrator Back End
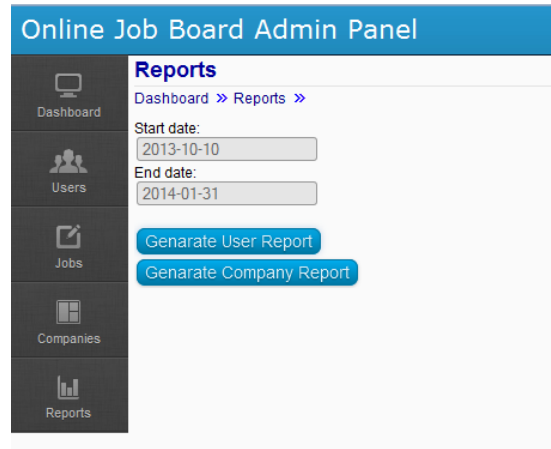
Figure Appendix B -11: Report Management View of Administrator Back End
View of JobSeeker Profile

Figure Appendix B -12, Figure Appendix B -13 and Figure Appendix B -14 are shown in the jobseeker profile of the web portal.
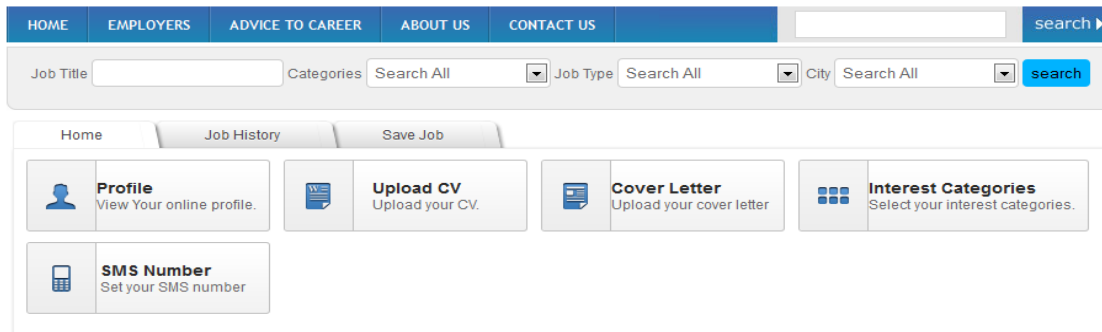
Figure Appendix B -12: Home View of Jobseeker Back End

Figure Appendix B -13: View Applied Job Details

Figure Appendix B -14: View Saved Job Details

View of Employer Admin Panel

Figure Appendix B -15, Figure Appendix B -16 and Figure Appendix B -17 are shown in the employer admin panel of the system. This is the back end of the employer.

Figure Appendix B -15: View Home Page of Employer Back End

Figure Appendix B -16: View Add Job Details Page of Employer Back End

Figure Appendix B -17: View Job Applicants Details Page of Employer Back end

Appendix C – Important Coding Parts

These Coding parts are included "/admin/module/job/index.php" file. Administrator is activated job status as "Active" then system send sms alert to job seeker.

```
$lock = false;
$message_class ='message_error';
$message = "";

if(!isset($_POST['status_id']) || empty($_POST['status_id'])){$lock = false;$error_com[0]
=true;}else{$lock=true;}
if(!isset($_POST['expir_date'])        ||        empty($_POST['expir_date'])){$lock        =
false;$error_com[1] =true;}else{$lock=true;}

if($lock){
        $insert_sql = "UPDATE `jobs` SET `status_id`='".$_POST['status_id']."' WHERE
(`job_id`='".$_POST['jobid']."')";
        if($db->query($insert_sql)){
                $message_class ='message_ok';
                $message = 'Job Status updated';

                //send SMS to allowed users
                $getSmsNumber = "SELECT
                        user_phone.phone_num,jobs.job_title
                        FROM jobs
                        INNER JOIN user_job_cat ON jobs.cat_id = user_job_cat.cat_id
                        INNER    JOIN    user_phone    ON    user_job_cat.user_id    =
user_phone.user_id
                        WHERE user_phone.status_id = '1' AND
                                jobs.status_id = '1' AND
```

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```php
                        jobs.job_id = '".$_POST['jobid']."'";
            $getData = $db->get_results($getSmsNumber);
            if($db->num_rows>0){
                    foreach($getData as $dataRow){
                            $smsText = '';

                            $smsText = 'New job posted. Job ID: '.$_POST['jobid'].'
Title:'.$dataRow->job_title.'.    For      apply      now      send      sms      as
APPLY#<JOBID>#<YOUREMAIL>#';

                            $insertDb = $db->query("INSERT INTO
                            ozekismsout (sender, receiver, msg, status_id, msgtype,
operator)
                            VALUES ('JOB ALERT', '".$dataRow->phone_num."',
                                    '".$smsText."',
                    'send', 'SMS:TEXT', 'ALERT')");
                    }
            }
      }else{
            $message = 'Job did not updated, Please try again';
      }
}
```

After Job seeker is responded to SMS Alert, then system read sms and update database used following coding. These coding parts are included "/includes/dbmodel.php" file

```php
//read sms respond
function readSmsRespond(){
      global $db;
      $getSms = $db->get_results("SELECT ozekismsin.id,
```

```
                                        ozekismsin.sender,
                                        ozekismsin.msg
                                        FROM ozekismsin
                                        WHERE ozekismsin.read_status = '0' AND
                                        ozekismsin.msgtype = 'SMS:TEXT'");
        if($db->num_rows > 0){
                foreach($getSms as $rowSms){
                        //update sms as read
                        $db->query("UPDATE ozekismsin SET read_status='1' WHERE
(id='".$rowSms->id."')");
                        //read sms format
                        $replySms = $rowSms->msg;
                        $getText = explode('#',$replySms);

                        if(strtoupper($getText[0])=='APPLY'){
                                if(filter_var($getText[1], FILTER_VALIDATE_INT)){
                                        if(validateEmail($getText[2])){
                                                //user check
                                                $checkUser = $db->get_row("SELECT
        sso_users.user_id,
        user_cover_letter.cl_id,
        user_cv.cv_id
        FROM
        sso_users
        INNER JOIN user_cv ON sso_users.user_id = user_cv.user_id
        INNER JOIN user_cover_letter ON sso_users.user_id = user_cover_letter.user_id
        WHERE
        sso_users.user_email = '".strtolower($getText[2])."' AND
        sso_users.status_id = '1'
```

```php
LIMIT 1 ");

                if($db->num_rows == 1){
                        //check job
                $check = $db->get_row("SELECT  job_id
                                FROM  jobs
                                WHERE job_id = '".$getText[1]."' AND
                                        status_id = '1'");
        if($db->num_rows == 1){
        //after validate security code and login
        $insertSql = $db->query("INSERT INTO job_apply (
                        user_id, job_id, cv_id,
                        cover_letter_id, status_id, added_date)
                        VALUES ('1', '".$getText[1]."', '".$checkUser->cv_id."',
                        '".$checkUser->cl_id."', '1', '".date('Y-m-d H:i:s')."')");
        //$db->debug();
if($insertSql){
$message ='Successfully applied for job.';
$insertDb = $db->query("INSERT INTO
ozekismsout (sender, receiver, msg, status_id, msgtype, operator)
                VALUES ('APPLIED', '".$rowSms->sender."', '".$message."',
                        'send', 'SMS:TEXT', 'ALERT')");
                                        }
                                }
                        }
                    }
                }
            }
        }
}
```

}

Appendix D – Test Cases

Test Case –Job Seeker Upload CV Successful Scenario

Test Case ID	5
Test Case Name	Upload CV
Purpose	Check whether uploaded valid file type of CV.
Pre-requisites	The user must Login to the system
Test Data	CV Name, Upload File with given extension (.doc, .docx, .txt, .pdf, or .odt)
Steps	Enter CV Name. Browse upload file and locate it. Click on Upload Button. System Check file extension is valid. Got message "Your CV Successfully Uploaded".
Test Result	Successful

Table Appendix D - 1: Test Case – Upload CV Successful Scenario

Test Case –Job Seeker Upload CV Un-successful Scenario

Test Case ID	6
Test Case Name	Upload CV
Purpose	Check whether uploaded invalid file type CV.
Pre-requisites	The user must Login to the system
Test Data	CV Name, Upload File without given extension (.doc, .docx, .txt, .pdf, or .odt)
Steps	Enter CV Name. Browse upload file and locate it. Click on Upload Button. System Check file extension is valid. Got error message "Your File type is not valid".

Test Result	Successful

Table Appendix D - 2: Test Case – Upload CV Un-successful Scenario

Test Case –Job Seeker Update Interest Job Categories Successful Scenario

Test Case ID	7
Test Case Name	Update **Interest Job Categories**
Purpose	Check whether **Interest Job Categories** are updated successfully.
Pre-requisites	The user must Login to the system
Test Data	**Job Categories** List with Check Box
Steps	Ticked Check Box one or more job **categories**. Click on Save Button. System Check **Job Categories** are selected. Got message "Selected categories added as your interest fields".
Test Result	Successful

Table Appendix D - 3: Test Case – Update Interest Job Categories Successful Scenario

Test Case –Job Seeker Update Interest Job Categories Un-successful Scenario

Test Case ID	8
Test Case Name	Update **Interest Job Categories**
Purpose	Check whether **un-selected Interest Job Categories** are given error massage.
Pre-requisites	The user must Login to the system
Test Data	**Job Categories** List with Check Box
Steps	Ticked Check Box one or more job **categories**. Click on Save Button. System Check **Job Categories** are selected. Got error message "Please select job category".
Test Result	Successful

Test Case –Job Seeker Update SMS Number Successful Scenario

Test Case ID	9
Test Case Name	Update **SMS Number**
Purpose	Check whether Mobile Phone Number is updated successfully.
Pre-requisites	The user must Login to the system
Test Data	**SMS Number** (Mobile Phone Number)
Steps	Enter Valid SMS Number. Click on Save Button. System Check SMS Number is correct format. Got message "Phone number save as your SMS number". System Generated SMS are received to mobile phone as "Thank U for enter Ur mobile number on Job Board."
Test Result	Successful

Table Appendix D - 5: Test Case – Update SMS Number Successful Scenario

Test Case –Job Seeker Update SMS Number Un-successful Scenario

Test Case ID	10
Test Case Name	Update **SMS Number**
Purpose	Check whether **Invalid Mobile** Phone Number is not updated and given error massage.
Pre-requisites	The user must Login to the system
Test Data	**SMS Number** (Mobile Phone Number)
Steps	Enter Invalid SMS Number. Click on Save Button. System Check SMS Number is correct format. Got error message "Please enter correct mobile number".

Test Result	Successful

<p style="text-align:center">Table Appendix D - 6: Test Case – Update SMS Number Un-successful Scenario</p>

Test Case – Save Job Detail Successful Scenario

Test Case ID	11
Test Case Name	Save Job Details
Purpose	Check whether job detail is saved and updated successfully.
Pre-requisites	The user must Login to the system
Test Data	Job ID, User ID
Steps	View Recent Job List. Click on the Job Data and View Job Description. Click on Save Job Button. System Check user is saved job details already. Got message "Successfully save job". Check update the save job details in jobseeker back end.
Test Result	Successful

<p style="text-align:center">Table Appendix D - 7: Test Case – Save Job Detail Successful Scenario</p>

Test Case – Save Job Details Un-successful Scenario

Test Case ID	12
Test Case Name	Save Job Details
Purpose	Check whether saved job detail cannot save again.
Pre-requisites	The user must Login to the system and job detail is saved already.
Test Data	Job ID, User ID
Steps	View Recent Job List. Click on the Job Data and View Job Description. Click on Save Job Button. System Check user is saved job details already. Got error message "You are saved this Job".

Test Result	Successful

Test Case – Print Job Details

Test Case ID	13
Test Case Name	Print Job Details
Purpose	Check whether Job Details are printed successfully.
Pre-requisites	The user must Login to the system
Test Data	**Job ID**
Steps	View Recent Job List.
	Click on the Job Data and View Job Description.
	Click on Print Job Details Button.
	View Print Job Details.
	Click on Print Button.
	Set Printing Settings and Click on Ok Button.
	Printed Job Details
Test Result	Successful

Test Case – Apply Job Successful Scenario

Test Case ID	14
Test Case Name	Apply Job
Purpose	Check whether user can apply to job and details are updated successfully.
Pre-requisites	The user must Login to the system and uploaded CV and Cover Letter.
Test Data	Job ID, User ID, CV ID, Cover Letter ID, CAPTCHA image

Steps	View Recent Job List.
	Click on the Job Data and View Job Description.
	Click on Apply Now Button.
	System Check user is applied to job already.
	System Check CV and Cover Letter are already updated.
	Enter CV Name.
	Enter Cover Letter Name.
	Enter Valid CAPTCHA image.
	Click on Apply Button.
	Got message "Successfully applied for job".
	Check update the apply job details in jobseeker back end.
Test Result	Successful

Table Appendix D - 10: Test Case – Apply Successful Scenario

Test Case – Apply Job Un-successful Scenario

Test Case ID	15
Test Case Name	Apply Job
Purpose	Check whether user can apply to already apply job again.
Pre-requisites	The user must Login to the system, have uploaded CV and Cover Letter and user applied to job already.
Test Data	Job ID, User ID, CV ID, Cover Letter ID, CAPTCHA image
Steps	View Recent Job List.
	Click on the Job Data and View Job Description.
	Click on Apply Now Button.
	System Check CV and Cover Letter are already updated.
	Enter CV Name.
	Enter Cover Letter Name.
	Enter Valid CAPTCHA image.
	Click on Apply Button.
	System Check user is applied to job already.

	Got error message "You are applied this Job."
Test Result	Successful

<div align="center">Table Appendix D - 11: Test Case – Apply Un-successful Scenario</div>

Test Case – Apply Job Un-successful Scenario

Test Case ID	16
Test Case Name	Apply Job
Purpose	Check whether user can apply to job without upload CV or Cover Letter
Pre-requisites	The user must Login to the system and has not uploaded CV or Cover Letter
Test Data	Job ID, User ID, CV ID, Cover Letter ID
Steps	View Recent Job List. Click on the Job Data and View Job Description. Click on Apply Now Button. System Check CV and Cover Letter are already updated. Got error message "Please upload your CV before apply for jobs"
Test Result	Successful

<div align="center">Table Appendix D - 12: Test Case – Apply Un-successful Scenario</div>

Test Case –Add Job Process -Successful Scenario

Test Case ID	17
Test Case Name	Add Job
Purpose	Check whether new job added to system successfully.
Pre-requisites	The user must Login to the system and company must register the system.

Test Data	Title, Advertisement type, Banner Image or Description, Company, Apply Type, Category, Job Type, Email, Phone, Address and Expire Date.
Steps	Enter Title Select Banner Only or Text Only Upload Banner Image or Edit Job Description Enter Company Name using Autosuggestion Select Apply Type Select Job Category. Select job Type If you need change Email, Phone and Address (After Selected Company this field are auto filled.) If you need change Expire Date Select Date Using Calendar. Clicked Add New Button Got message "Thank you. Job successfully added".
Test Result	Successful

Table Appendix D - 13: Test Case –Job Seeker Registration Process -Successful Scenario

Test Case –Update job Status

Test Case ID	18
Test Case Name	Update job Status As "Active"
Purpose	Check whether **Job Status is Successfully updated**.
Pre-requisites	The administrator must login to the system
Test Data	**Job Status**
Steps	Select Job Status as "Active". Got message "Job Status updated".
Test Result	Successful

Table Appendix D - 14: Test Case – Update Job Status

Test Case –Send SMS Alert

Test Case ID	19
Test Case Name	Send SMS Alerts
Purpose	Check whether **SMS Alerts are received**.
Pre-requisites	The administrator must update job status as "Active". Job seeker must active SMS alert (Update Mobile Number) and Update **Interest Job Categories**. System must connect to SMS gateway (Ozeki Massage severs) and All the services of SMS gateway must activate.
Test Data	**SMS Number, Job ID,** Job Status, Job **Category ID,** User ID and User **Interest Job Category ID**
Steps	System Check SMS alert activated Users and their **Interest Job Category ID** are same as Job **Category ID**. System Send Auto Generated SMS to User's Mobile Phone. Users received SMS alerts as given format "New job posted. Job ID: 93 Title: Teacher. For apply now send sms as APPLY#<JOBID>#<YOUREMAIL># "
Test Result	Successful

Table Appendix D - 15: Test Case – Send SMS Alert

Test Case –Respond SMS

Test Case ID	20
Test Case Name	Send Respond SMS
Purpose	Check whether **SMS are received to System and Updated Successfully**.
Pre-requisites	User must received to SMS alerts Job seeker must Update CV and Cover Letter. System must connect to SMS gateway (Ozeki Massage severs) and All the services of SMS gateway must activate.

Test Data	**SMS Number, User Email, Job ID,** User ID CV ID and Cover Letter ID.
Steps	Send respond SMS as given format "APPLY#93#nishamalmal@yahoo.com#" System checks user email and updated system. System send SMS to user as "Successfully applied for job. "
Test Result	Successful

Table Appendix D - 16: Test Case – Respond SMS

User Evaluation Form

Web site	Online Job Board system

Name							
Designation							
Gender:	Male		Female				
Computer Skill	Basic		Normal		Good		Very Good	
Date of Visited							

Briefly describe, what is the content of the website in your words

1 →Strongly Disagree

2 →Disagree

3 →Moderate

4 →Agree

5 →Strongly Agree

1	The website is loaded quickly	
2	The website is user friendly	
3	The website has a good looking design	
4	The website has good content	

5	The website has good graphics	
6	User can easily navigate menu	
7	User can register to system easily	
8	No need to answer the unwanted question	
9	No broken links are identified	
10	The text is clearly written and easy to understand	
11	User profile update easily	
For Job- seeker		
12	Can search job easily	
13	Can apply job easily	
For Employer		
12	Can Post Job easily	
13	Can view Jobseeker CVs easily	
14	The site is interesting	
15	Could you provide any suggestion to improve the system?	
16	Do you recommend the web portal any other client?	