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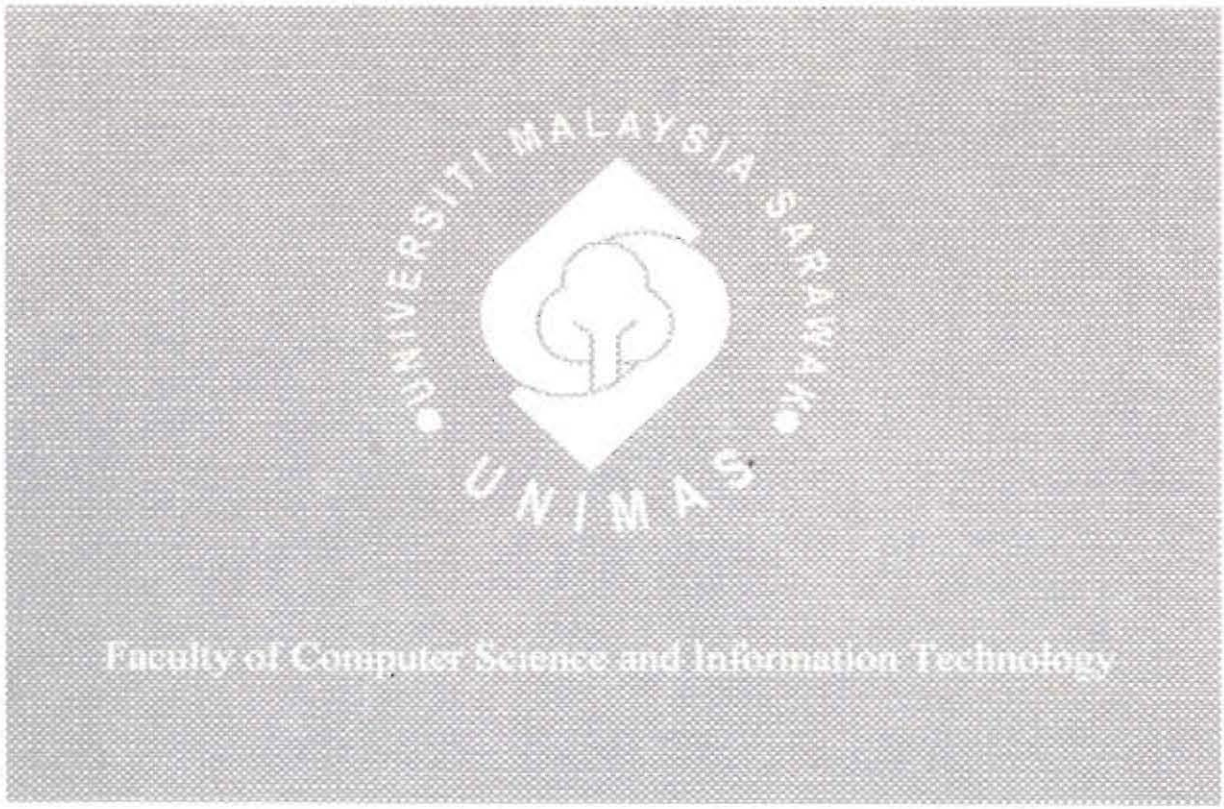


# *FRESH GRADUATE SKILL MANAGEMENT SYSTEM*

Ling Wan Chung

Bachelor of Computer Science with Honours
(Software Engineering)
2015

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# FRESH GRADUATE SKILL MANAGEMENT SYSTEM

LING WAN CHUNG

This project is submitted in partial fulfilment of the
Requirements for the degree of
Bachelor of Computer Science with Honours
(Software Engineering)

Faculty of Computer Science and Information Technology
UNIVERSITI MALAYSIA SARAWAK

2015

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## ABSTRACT

*Problem in identifying the skill of a candidate during the employment is always the issue faced by the employer. The main aim for this thesis is to study the importance of one's soft skill and to explore and design a prototype of a system which able to assists the human resource department to get the best matches skill of the candidate during the employment. Apart from that, the preliminary study shows the security of a system is important. This thesis also aim to explore the development of a life system, which will addressed issues, such as security and modular system development. The method used in this project is Object-Oriented methodology and a prototype system has been designed and developed. Use case diagram, activity diagram and sequence diagram were used to design the proposed system. Apart from that, as potential users will likely be employers from different organisations, there is a need to ensure this system can be used immediately and security concern are dealt with. In this respect, this system has been designed using the multitier architecture to ensure the security of data, fault tolerance and scalability. This system was then tested according to the ISO 9126, software quality assurance to ensure the proposed system matched the user needs. The testing has shown that the users were satisfied with the overall design and functionality of the system. Comments and suggestion given were noted for future enhancement.*

## ABSTRAK

Masalah dalam mengenal pasti kemahiran calon dalam pegambilan pekerja baru sering menjadi isu yang dihadapi oleh setiap majikan. Tujuan utama bagi projek ini adalah untuk mengkaji kepentingan bagi kemahiran insaniah seseorang dan meneroka dan mereka bentuk prototaip sistem yang dapat membantu jabatan sumber manusia untuk mendapatkan calon yang dipadankan. Kajian awal menunjukkan bahawa keselamatan sistem computer adalah penting. Oleh itu, tesis ini juga bertujuan untuk membina system computer yang akan menangani isu-isu seperti keselamatan system dan pembangunan sistem modular. Sistem prototaip telah direka dan dibinakan dengan menggunakan kaedah "Object-Oriented" metodologi. Gambar rajah seperti "Use Case diagram", "Activity diagram", dan "Sequence diagram" digunakan untuk mereka bentuk sistem. Selain itu, pengguna industri merupakan pengguna salah satu pengguna system yang penting. Demi memastikan system ini dapat digunakan dengan serta-merta, keselamatan system harus diprihatinkan. Sistem ini telah direka menggunakan seni bina multitier untuk memastikan keselamatan data, toleransi kesilapan dan skala. Sistem ini kemudiannya diuji mengikut ISO 9126, perisian jaminan kualiti untuk memastikan sistem yang dicadangkan sepadan dengan keperluan pengguna. Ujian ini telah menunjukkan bahawa pengguna berpuas hati dengan reka bentuk keseluruhan dan fungsi sistem. Komen dan cadangan yang diberikan telah direkodkan untuk pembangunan masa depan.

# 1 CHAPTER 1: BACKGROUND

## 1.1 Introduction

Recently in this competitive job market, one must have the repertoire of related technical skills to get and keep a job. However, according to Coughlan (2015), soft skills need to be taken much more seriously as factors for business success. In the study of the importance of soft skills from the perspectives from employers and community colleges by Seattle Jobs Initiative (n.d.), more than 75% of employers agreed that soft skills were as important as those technical skills, while some say it is more important than the technical skills. These skills reflect how one interact, lead and communicate with people surrounding. Some soft skills, such as critical thinking and the ability to adapt to the environment are difficult to teach and train. Therefore, choosing one who initially has these skills is vital for the employer.

The Human Resource department plays a vital role to identify the talented, promising, and hardworking among the candidates. One of the importance of human resource listed in Role and importance of human resources (n.d.) is recruiting suitable candidates for the organization, where a bad hiring can cost up to millions of dollars and the potential of negative impact to the company. To choose one with these skills, the employer only can refer to the Curriculum Vitae (C.V.) or résumé before they employ the employee. Hence, the psychometric test should be used as a tools to assist the employer to measure the mental capabilities and behavioural styles of an individual.

The purpose of this project is to design a tool for the personal psychometric test, which will be able to provide a better support to the students in their future career application after graduation. Besides, organisations and companies are able to choose and understand more about the potential candidates via the psychometric test of this system. This system will include the security part to ensure all the data stored in the system are safe.

## 1.2 Problem Statement

According to the study by Seattle Jobs Initiative (n.d.), more than 75% or even more of the business surveyed stated that the soft skills were as important as the technical skills. Soft skills seem to be one of the key aspect in the entry-level employment. However, pressure by most of the families and schools to achieve to the top slowly leads the society nowadays became over-emphasized on the paper examination. Soft skills such as leadership, communication, social, etc. are not being focused or tested as one's performance in their study time. Therefore, although they stated that the soft skills were as important as the technical skills, however they have no ways to track the skill.

Some courses taken by candidates during their university time provide evaluation form. These forms are normally record how this candidate performs and works with a group. Unfortunately, these important data is not stored or recorded in their certificate. It only acts as references to the course coordinator to allocate the mark/grade of the assessment. In fact, these are the most wanted information from the perspective of the employers. Perhaps, some software, such as applicant tracking system was used by organisations to help them to get more information about an individual before employment. Yet, the problem of retrieving one's soft skill remains unsolved.

In this proposed system, one of the major users is from the industry, where the employer will log into the system to search and view the candidates. Therefore, the security of the system plays a vital role to ensure the functionality of this system. The hidden problems of technological advancement is the security of the cyber criminals. According to Intel Security (2014), cybercrime is a growth industry. Even the smallest estimated figures of losses to the global economy, which are $375 billion is more than most countries' national income. The secure of the internet services are vital become an indubitable fact.

In addition, most of the idea and system of final year projects developed by the students in university were actually good enough for commercials. However, due to the security of the product is not properly developed, most of the projects still stored in the database and never used or continued. Therefore, the data stored in the proposed system must be confidential before the system disclose to the public. The development of security for the web application become a must in order to avoid the cybercrime.

## 1.3 Objective

The objectives of this project are as shown below:

- To study the requirements relating to the leadership and soft skills specifications that best matches the Human Resource organisations need.
- Design an appropriate instrument (psychometric test) and a model that addresses the Human Resource needs.
- To explore a secure life system that is modular to model a potential employee skill-sets and a true measure of performance
- To test the system and validate the proposed model with the industry

## 1.4 Methodology

### 1.4.1 Introduction

This project is using the object-oriented (OO) development life cycle throughout the whole project. The OO methodology consists of 3 major parts, which are object-oriented analysis, object-oriented design and object-oriented implementation. The reason for choosing this methodology to design the proposed system is due to:

- The OO development is different from the traditional software development approach, where it is based on the functions and procedures of a system.

- The principles of OO, such as encapsulation, inheritance and polymorphism act as a powerful tool which allow the objects can be easily replaced, modified and reused
- OO is adapting to the changing of requirements, easier to maintain, more robust and the code is reusable

### 1.4.2 Object Oriented Analysis

During the OO analysis, the system requirements are determined and concerned. The required classes as the object, the relationships between the objects, the functions and features of the proposed system were identified. To ensure the requirements and features are useful to the market, an interview to the manager of Human Resource Department from Leesing Logistic Company is conducted. A set of questionnaires also distributed to 20 recruiters in order to get their expectation in either candidate's academic result or soft skills.

### 1.4.3 Object Oriented Design

Three applicant tracking systems were reviewed during this phase to gather the strength and weakness of these systems in the candidates' skill identification. This also helps to determine the basic requirements for the proposed system.

Apart from applicant tracking system, the Morpheus Universiti Malaysia Sarawak is the current system used by the students and academic staff for the purpose of academic. The last system reviewed in this project is the Mahara, an e-portfolio system which developed by the government of New Zealand on the October 21, 2014. A comparison is made between these 5 systems. The specification of the proposed system is determined, which will be discussed in Chapter 2.

From the requirement study, we present the problem domain, goals, and the user needs for this system. The architecture design of the system was completed during this phase. The

## 1.6 Significance of Project

The aim of this project is to develop a web based system for tracking the candidate's soft skills. This provides a platform to the employer to assist them in the decision to employ or reject. Without the skill information, the employer does not know the actual performance of the student and how well is the student when facing a different kind of challenges. This study will provide a basic evaluation on every student's data. It is important for the recruiter to find out the actual skills of the candidate before the hiring process being done.

## 1.7 Expected Outcome

The outcome of this project is a system that allows the employer to understand the student's performance and skills. The system will help the employer to make decisions during their staffing process.

## 1.8 Project Outline

### 1.8.1 Chapter 1: Introduction

This chapter describes an overview of the project in details which highlights on problem statement, objectives, methodology, project's scope, significance of the project, and expected outcome.

### 1.8.2 Chapter 2: Literature Review

This chapter concerned the background study of currently existing talent management system. The aim is to identify the goals and requirements of this project clearly. A proposed solution will be done during this chapter.

### 1.8.3 Chapter 3: Methodology

In this chapter, methodology implemented to accomplish the proposed system will be discussed which include the analysis and design of the system. As a guideline throughout the project,

the planning and structuring of the development, such as a system class diagram and system flow design will propose in this chapter.

### 1.8.4 Chapter 4: Implementation and Testing

Chapter 4 focuses more on the work of the proposed solution by implementing the methodology. The design of the system will be discussed in more technically.

### 1.8.5 Chapter 5: Software Quality Testing

Chapter 5 discussed the software quality testing carried out. This testing is based on the ISO/IEC TR 9126 standard to test the quality of the software. The result of the testing will be shown in this chapter. Strengths and weaknesses of this system will be analysed and recorded for future enhancement.

### 1.8.6 Chapter 6: Conclusion and Future Works

This chapter summarises overall findings and achievements that had been done during the development. Meanwhile, the future works recorded will be described during this topic.

# 2 CHAPTER 2: SYSTEM REVIEW

This chapter provides the overall background knowledge of the importance of discovering the skills of a candidate before the employing process. Some open source and proprietary systems were reviewed for the understanding of how the employer selects the appropriate employee.

## 2.1 Introduction

According to the president and CEO of Trinet, Burton Goldfield (2009), companies desperately compete for the top talent candidates. A single bad hire can cost more than $60,000. No one willing to spend their precious dollars on this in a difficult market (Goldfield, 2009). Besides, the de-hiring process spent more money and time. If the de-hiring process was not handled carefully, the morale and reputation of the company as an employer will be put at risk, where the impression of society to the company become negative. To avoid these problems, the majority of the companies adopted four steps in hiring a right person, which are résumé screening, interviewing, testing and reference checks (*Four basic steps*, n.d.).

Résumé screening is a process to determine whether a candidate has the basic knowledge and skills required for the position. It is used to filter the candidates for interview. During the interview, it is often where candidates were interviewed and evaluated by the Human Resource department based on their previous experience. Some organisation conducts the paper or personality test, in order to figure out the ability and skills in more detail. While References Check is to validate and ensure the information given is trustworthy.

Some systems have been introduced to ease the process of hiring and tracking of the candidate's performance. These systems include TargetRecruit, Applicant Tracking System.CO and Zoho Recruit. These systems were listed as the top applicant system. Apart from applicant tracking system, the online system used by the staff and student in Universiti

Malaysia Sarawak and the online portfolio system also being reviewed for better understanding of the current problem faced.

## 2.2 Reviewed System and Literature

### 2.2.1 Review of TargetRecruit

TargetRecruit was founded in 2008 by a talented team of Staffing Executives and IT professionals. It is a web based Applicant Tracking Software, which designed for recruiting and staffing purpose. It helps the employer to pick and choose the right staff through its automated skill matching and auto generates qualified candidates. According to *TargetRecruit Teams with Act-On* (2014), it is one of the most highly recommended recruiting applications in Salesforce.coms application marketplace, AppExchange. Besides, staffing and recruiting firms worldwide use TargetRecruit as an end-to-end solution for running their staffing (*TargetRecruit Teams with Act-On*, 2014).

One of the features that will be focused on this project is the "Jobs" feature. In TargetRecruit, the job can be created in several ways, such as clone from an existing job, create from the "create new menu", create job manually or create a job from an opportunity. After the job is created, the recruiter will be able to view the job with all the details that related to this applicant as shown in Figure 2-1.

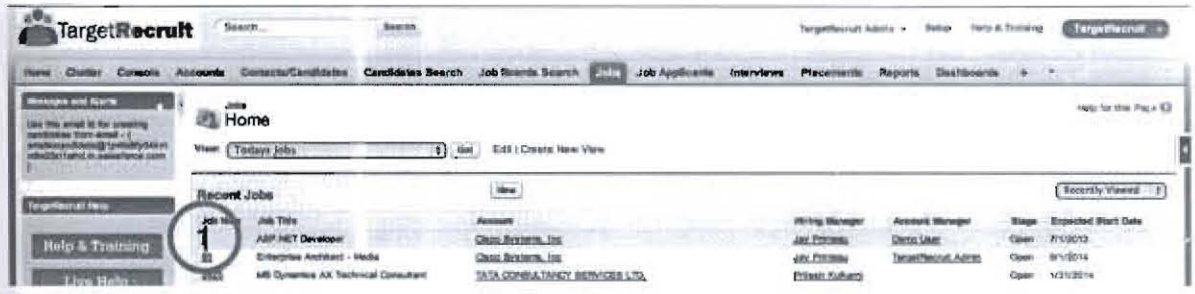


*Figure 2-1: List of candidates who related to job in TargetRecruit*

When a job is selected, the detail of the job and information that related to the job will be shown in a single page (Figure 2-2). Figure 2-3 shows one of the example of job's information in TargetRecruit, including the list of candidates who applied this job.

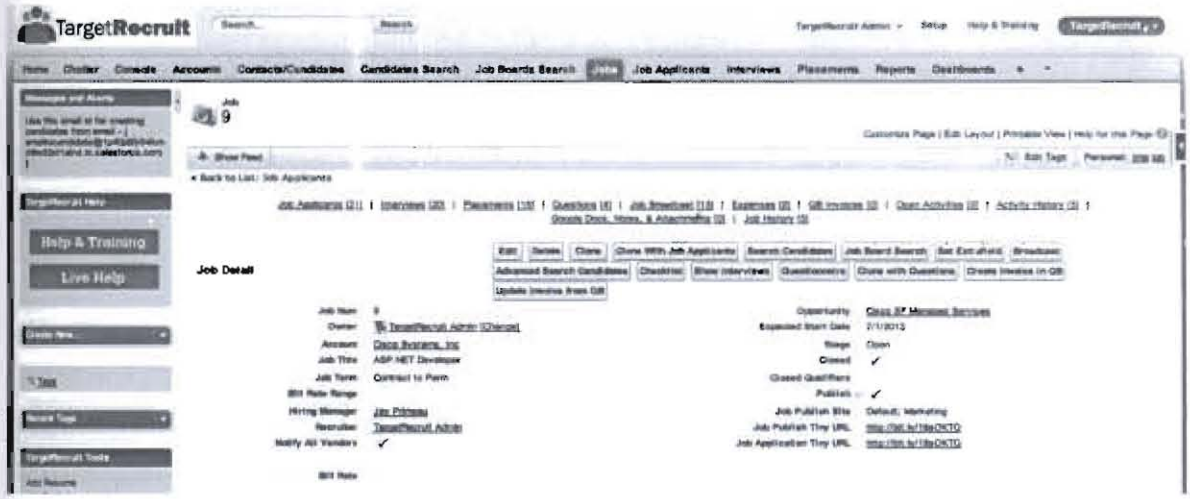


*Figure 2-2: Job's Detail Information in TargetRecruit*

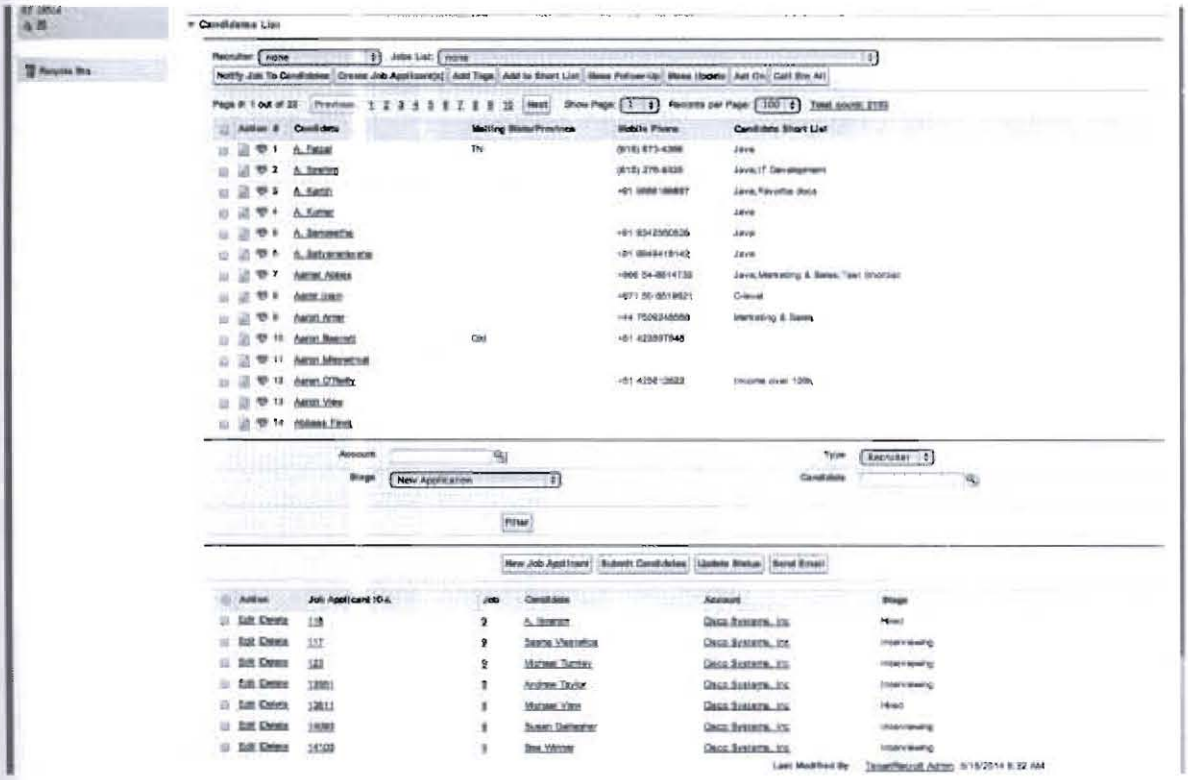

*Figure 2-3. Candidates List in Job Information*

The recruiter can select any candidates listed to view the detail information about the candidates (as shown in Figure 2-4).

*Figure 2-4: Candidates' Detail Information in TargetRecruit*

The "Skills" section in the candidate's information records the list of skill of a candidate. These skills were entered manually during the creation of candidate, as shown in Figure 2-5.

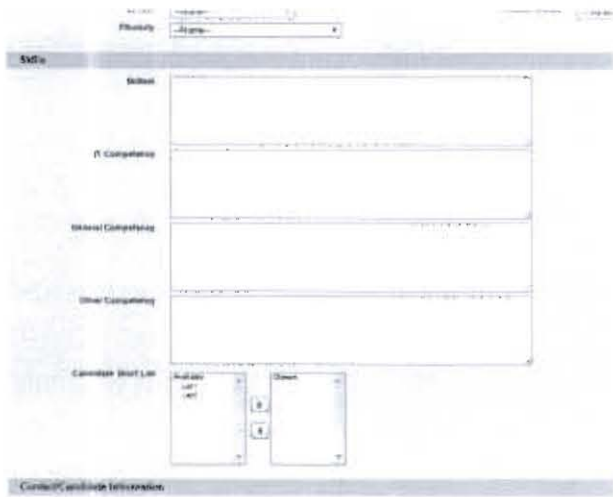

*Figure 2-5: Field to insert skills in TargetRecruit*

The disadvantage of this system lies with the incongruent representation of default skills listed in system and the actual skills were manually inserted by user. Skills matched by the automated skill matching function as mentioned previously became unconvincing.

### 2.2.2 Review of Applicant Tracking System.CO

Applicant Tracking System.CO is a free cloud based enterprise recruiting software. Similar to TargetRecruit, this system also provides many features to assist the employer during the hiring process. In the Applicant Tracking features, there is a function named as Résumé Parsing. This function allows the user to upload all résumé into the system as shown in Figure 2-6. The system will automatically parses the résumé and gets the information from the résumé before storing these information into the database (Applicant Tracking System, n.d.).

Once the résumé is uploaded, the recruiter can view the applicant details, check suitability and wait for approval based on the information parsed from the résumé. However, these information come from the candidate, where majority of the candidate will overemphasize their skills in order to get the job.

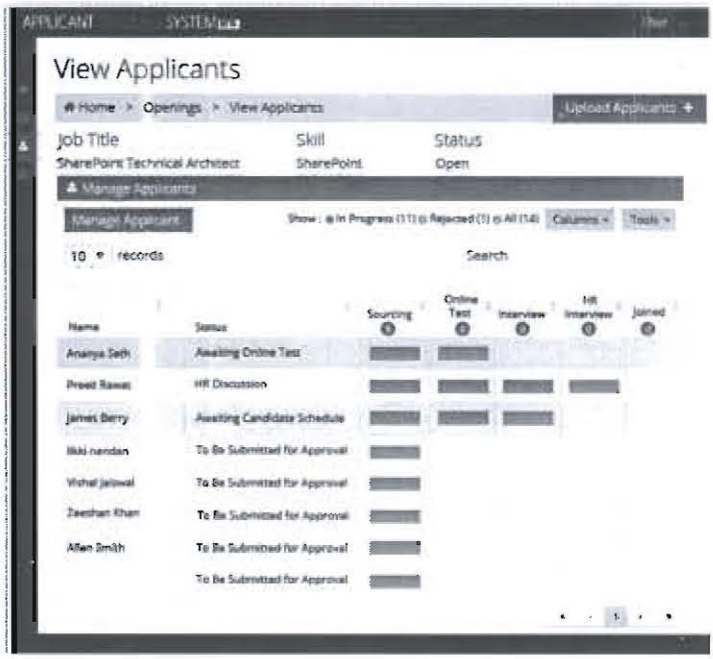


*Figure 2-6: Interface for upload résumé and applicants management*

### 2.2.3 Review of Zoho Recruit

Zoho recruit is the third applicant tracking systems reviewed in this project. This system provides several functions to assist the hiring process, such as Source and Reach candidates, Résumé management, Create and publish job openings, résumé parser, activity stream, etc. Similar to the Applicant Tracking System.CO, Zoho Recruit used the résumé parser to get the candidate's information and skills into their database for future searching and hiring process.

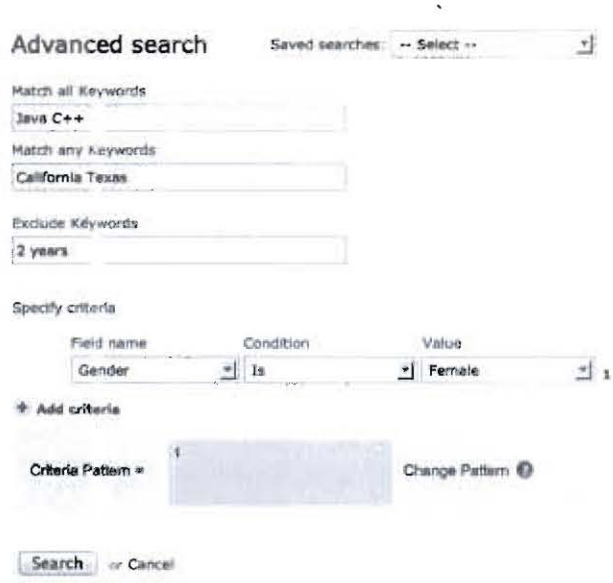


*Figure 2-7: Advance Search Function*

After the résumé had been uploaded into the system, Zoho Recruit has the résumé management function where an advanced search can be done to find a candidate with specific skills as shown in Figure 2-7. Zoho recruit also has the feature, where the skills of the candidate can be added manually.

### 2.2.4 Review of Morpheus Universiti Malaysia Sarawak

Morpheus is the official learning system of Universiti Malaysia Sarawak (UNIMAS). It has several functions that help to engage the student-centred learning. One of the functions in Morpheus is that, it allows lecturers to collect assessments in soft copy. Once the students