CLICK A JOB

RECRUITMENT SYSTEM BASED ANDROID MOBILE APPS

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CLICK A JOB

By

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VALIDITY OF SUPERVISOR

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On behalf of:

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As part of graduation of degree

Bachelor Computer Science (Networking)

By:

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DECLARATION

I declare that the thesis is my original work except for the quotations and citations which have been duly acknowledged. I also declare that it has not been previously, and is not concurrently, submitted for any other degree at University Putra Malaysia or at any other institution.

_____

(Koo Sheng Kuan)

Date:

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ABSTRACT

The project is regarding the development of Curriculum Vitae System (CVS) which consists of mobile application and web application. Click A Job is the CVS based on android mobile application. Two types of user been categorized which are employee and employer. Click A Job allow employee to create curriculum vitae or resume related to their information. The curriculum vitae or resume can be edited at anytime and anywhere with internet access. Beside that they can share their resume to third party through email. On top of that, employee can apply for jobs post by employer. In the same time, employer can post vacancy which viewable and apply by employee in the mobile apps. Furthermore, employer can receive job application and view their resume. In short, Click A Job is an android mobile application to make employment simple, convenient and most of all user friendly. Development of Click A Job will be the best wayfor employee to create resume and apply jobs and ease the employment process. Click A Job is a safe and reliable platform for employment.

ABSTRAK

Projek ini adalah berkenaan pembangunan *Curriculum Vitae System (CVS)* yang terdiri daripada aplikasi mudah alih dan aplikasi web. *Click A Job* adalah aplikasi berasaskan mudah alih android. Dua jenis pengguna telah dikategorikan iaitu pekerja dan majikan. *Click A Job* membenarkan pekerja membuat resume berkaitan dengan maklumat mereka. Resume boleh diedit pada bila-bila masa dan di mana sahaja dengan akses internet. Selepas itu, mereka boleh berkongsi resume mereka kepada pihak ketiga melalui e-mel. Di samping itu, pekerja juga boleh memohon untuk kerja yang telah dipaparkan oleh majikan. Dalam masa yang sama, majikan boleh menghantar kekosongan perkerjaan yang pekerja boleh lihat dalam applikasi itu dan memohon perkerjaan. Selain itu, majikan boleh menerima permohonan pekerja dan lihat resume mereka. Pendek kata, *Click A Job* ialah aplikasi mudah alih android untuk menjadikan pencarian dan permohonan kerja lebih mudah dan selesa. Pembangunan *Click A Job* adalah idea yang terbaik untuk menggalakkan pekerja membuat resume mereka dan memohon pekerjaan sementara majikan boleh mencari calon bagi kekosongan jawatan dengan mudah. Akhir kata *Click A Job* adalah satu platform yang selamat dan dipercayai untuk tujuan pengambilan pekerja.

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LIST OF ABBREVIATIONS

Abbreviation	Full Form
CV	Curriculum Vitae
SDLC	Software Development Life Cycle
IDE	Integrated Development Environment
ADT	Android Development Tool
XML	Extensible Mark-Up Language
HTML	Hypertext Mark-Up Language
HTTP	Hypertext Transfer Protocol
JSON	JavaScript Object Notation
PHP	Hypertext Pre-processor
SQL	Structured Query Language
ERD	Entity-Relationship Diagram

CONTENTS

CHAPTER 1

INTRODUCTION

1.1 Background

Nowadays smartphone, tablet, and fast-expanding family of wearable's and other smart devices are transforming the way people live, work, play, connect and interact [1]. As a result, mobile devices have become one of the essential parts throughout human's life. The development in mobile device technology has led the mobile application and mobile web development into a new era. Almost any type of application can be downloaded on mobile phones these days and it helps many people on many ways. Mostly mobile applications are Android-based application. It's the largest installed base of any mobile platform and growing fast [2].

Android is an open-source operating system maintained by Google [3]. It is a Linux-based operating system designed primarily for touch screen mobile devices such as smart phones and tablet computers. Android does a software bunch comprise not only operating system but also middleware and key applications [4]. Android is a powerful Operating System supporting a large number of applications of smart phones. These applications make life more comfortable and advanced for the users [5].

A curriculum vitae, regularly referred to as CV, is a more drawn out and more detail synopsis or abstract than a resume. It's an introduction to display and advancing your academic and career [6]. CV presents a record of one's qualities, abilities and experiences to employers, so that it can be used for apply for vacancy or any purpose that required a submission of CV. It includes a summary of academic background, including teaching

experiences, degree, research, awards, publications, achievements and other details. [7]

This project is to develop an Android-based mobile application known as Click A Job. The targeted user for CVS will be categorized as employee and employer. Through this mobile app, employees will be able to create their curriculum vitae or resume faster according to the different formats and directly shared to the other parties. Employer will able to post vacancy and view the candidates. It's easy to use and make recruitment becomes more convenient. Smartphone can be a powerful tool if they have the perfect apps that provide a platform to help them create their CV.

1.2 Problem Statement

There are several problems faced during developing this project. The problem statements are including:-

1.2.1 Users having difficulty to create and edit their CV anytime and anywhere easily through mobile devices as mostly other system is focus on desktop user. Mobile user having difficulty on low mobility on other devices. [8]

1.2.2 Users might not get used to the standard CV or resume formats. There are different format of CV or resume for different application or different purposes [9]. This means that those formats might not being known by certain individual. For example, the fresh graduate students, they might not familiar to certain format.

1.2.3 The existed system is not applicable for the users to submit CV or resume. Some other system only allows users to create resume. Besides that, users might need to search for jobs by themselves so that they can only submit their CV or resume for employment.

1.2.4 Other system interface is not specified designed for mobile user. It is not convenient and not user-friendly. This also make less efficient in recruitment.

1.2.5 There might be expensive cost to purchase this kind of mobile application. In addition, the cost of printing is also expensive and might be wasting of money.

1.3 Objectives

The main objective of this project is to create an application to run on Android phone. This application is known as Click A Job. There are several objective of this application as per below:

1.3.1 Produce a good quality and useful CV or resume editor application that is convenient and easy to be use by the users. This project is to develop a mobile apps that emphasis on interface design specific to mobile users.

1.3.2 Develop a system that allows users to create, edit, share CV or resume and apply for job at anytime and anywhere easily through their mobile devices.

1.3.3 Allow users(employee) to submit and appeal their CV or resumes to third partyand apply for the vacancy; Allow users(employer) to post their vacancy and view candidate so that the employment will be easier.

1.4 Scope

The scope of application of this system can be divided into 2 modules which are employee module and employer module. The module defined the functions of Click A Job for the employee and employer.

i. Employee – the user for this module will be public user, especially unemployed person. They can create CV or resume by submit through this mobile appsand share it between each other.

   a. Register or Login process - Needed for security issue. Only applicable to registered users to access.
   b. Create CV or resume -Input the related information through the mobile application and show out CV or resume quickly.
   c. Edit - Edit or update their CV that they had saved as draft before.
   d. View - View their saved CV.
   e. Share - Share CV or resume to third party through Email.
   f. Apply for job - View the list of vacancies and send application to those vacancies they're interested.

ii. Employer – the user for this module will be administrators of registered company or organization, which are looking for new employees. They can create a job post and submit through this mobile app.

   a. Register and Login process - Only applicable for registered company access the application.

b. Create vacancy - Input their vacancy details such as jobs scope and requirements.
c. Post vacancy - Post and share the vacancy details to others.
d. View candidate - View the list of applied candidate and see the details of their resume.

1.5 Thesis Structure

Overall, this thesis has divided into six major chapters where each chapter described more details about this project.

Chapter 1 is Introduction, state the problem statement and objectives, and explain about the scope of this project.

Chapter 2 is regarding the Literature Review. Explanation and discussion about mobile application had been discussed in this chapter. Explanation and review about the existing system is detailed out like project details, analysis and study of output in acquiring related information for this particular project.

Chapter 3 discussed about the Methodology used to fulfil the project objective and the scopes as well which is Software Development Life Cycle (SDLC). SDLC phases that involved in this project are planning, requirement analysis and design, coding, and testing. It describes the research design and the hardware approaches.

Chapter 4 describe about System Analysis and Design. It discussed the relation between the employee and employer of this system. It consists of use-case diagrams, flow charts, user interfaces design, and database design for the mobile application.

Chapter 5 is about Implementation and Testing, includes network structure, database setup, simple query operation for details, the testing strategies, descriptions and results for this system.

Chapter 6 is about Conclusion and Future Work which concluded about the output and result. Some suggestion for future works will be stated at the end of this chapter.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

In this chapter, literature review of this project is discussed in details. Mobile devices and the operating system, Android application and theory of Android application had been explained in this chapter. Besides that, Curriculum Vitae (CV) or resume is also defined and explained. The comparison between existing systems such as Jobstreet, Jobs in Malaysia, and CVmaker also has been discussed in this chapter.

2.2 Mobile Devices and Operating System

Mobile devices have become affordable and user friendly, nowadays nearly everyone has a mobile device or access to on. All walks of life now able to communicate and interact with an application, all at a touch of a button [10]. These applications range from the super arrangements to the planned arrangements. These gadgets offer communication access with friends, family and colleagues. It has now possible to access your office on a mobile device.

There are four major smartphone operating systems which are Android, iOS, Windows Phone and BlackBerry. Android operating systems is most commonly used and there are more than stated above. Android was introduced by Google on 20th **S**eptember 2008 [4]. It gains popularity on its model which is attractive and good in function. As time goes by, many features were introduced by Google play store as a symbol of android success. Google play was the official apps that were introduce and consists of millions of application in it. It is restricted only for android based such as Samsung, HTC, Motorola and many others. The advantages of using this android based operating system is that easy to install the applications and easy to use and mostly not restricted.

iOS, commonly used in iPhone, iPad and Pod touch was introduced on 29th June 2007. iOS does not allow any other manufacturer to commit and provide the highest security to user compare to other operating system. It concentrates more on quality and security instead of design. Thus, iPhone provide reliable user safety and a user friendly device. On this paper, only two of the main popular operating system was used for research. Figure below shows the statistic of popular operating system in Malaysia.

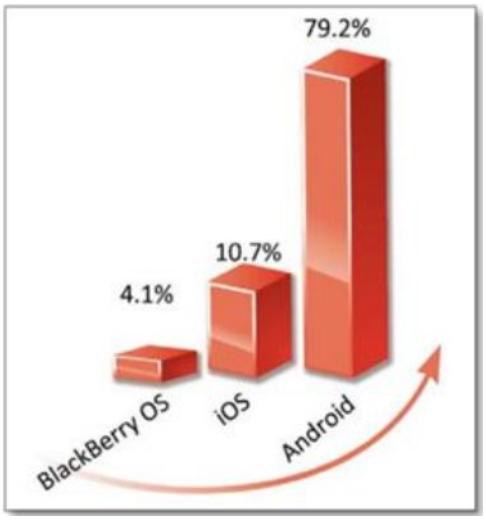

Figure 2.1: Operating system for mobile [11]

Based from the research, a large number of respondents could not name their operating system of their mobile on their own. In Malaysian technology market, Android makes the number one operating system for mobile phones 79.2% compare to other operating system such as iOS which is 10.7% and BlackBerry which is lesser than 4.1%. Android based mobile phones are much more affordable compared to iPhone. From this research, it shown that most of smartphone users are using Android compare to other operating system. Thus, by developing an Android based application can help majority users to benefit from this application [11].

2.3 Android Application

Android application has evolved since 2005. Google acquired Android Inc. on August 17, 2005, making it a wholly owned subsidiary of Google [12]. Google marketed the platform to handset makers and carriers on the promise of providing a flexible, upgradable system [4].

The version history of the Android mobile operating system began with the release of the Android alpha in November 2007. The first commercial version, Android 1.0, was released in September 2008. Since 2008, Android has seen numerous updates which have incrementally improved the operating system, adding new features and fixing bugs in previous releases [4]. The most recent major Android update is Android 6.0 "Marshmallow", which was released in October 2015.

Version	Codename	API	Distribution
1.6	Donut	4	0.1%
2.1	Eclair	7	1.7%
2.2	Froyo	8	4.0%
2.3 - 2.3.2	Gingerbread	9	0.1%
2.3.3 - 2.3.7		10	39.7%
3.2	Honeycomb	13	0.2%
4.0.3 - 4.0.4	Ice Cream Sandwich	15	5.3%
4.1.x	Jelly Bean	16	15.6%
4.2.x		17	18.1%
4.3		18	5.5%
4.4	KitKat	19	39.8%
5.0	Lollipop	21	9.0%
5.1		22	0.7%

Table 2.1 shows versions of Android.

On September 3, 2013, Google announced that one billion activated Android devices were in use worldwide. In June 2015, Android devices that accessed the Internet accounted for 59.1% of the worldwide smartphone and tablet market, 68.3% of the Chinese market, and 40.78% of the US market [13].

Figure 2.2 shows the evolution of Android OS.

2.4 Theory of Android Application

To program a basic android application, programmers need to know the Java programming language [14]. Moreover, some important rules have to be respected to obtain a valid project. All the features of an android project are combined in the file "Android-Manifest.xml". It is a XML file. All the important information about the project is in this file:

- The minimum and target SDK version used by the application.
- The device permissions, for example to permit the application to access the Internet.
- The official name of the application.
- The icon or the background picture of the application.

All this features can be set by the programmers [15]. The folder "res" is another important part of an android project. This folder contains a lot of other folders. All the pictures and the important files used by the application must be stored in a subfolder of "res". The graphical interface settings of the project can be set in the file "activity_main.xml" which are in the folder "res/layout/". Here again, it is a XML file. Programmers can drag and

drop components, called widgets, to built the interface or set all the parameters in the XML file. This is an example of widget properties in XML:

```
<ImageButton
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/ibEmployee"
    android:src="@drawable/employee"
    android:layout_marginBottom="20dp"
    android:layout_centerVertical="true"
    android:layout_centerHorizontal="true" />
```

As we can see, a lot of properties can be set for each widget, such as its height or its margin. Here the most important line is the lines android:id="@+id/ibEmployee" which gives a name and ID to the widget, and it can call another functions by this ID.

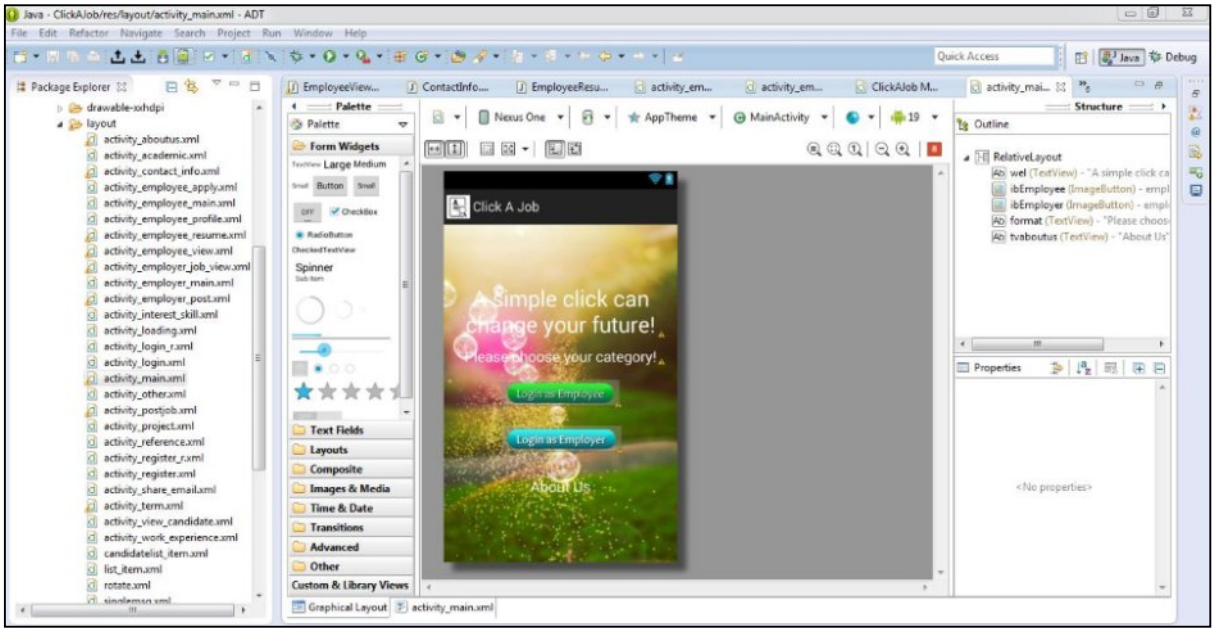

Figure 2.3: The interface to change Android graphical properties in Eclipse.

All the projects have to contain one class who inherit from "Activity":

```
public class MainActivity extends Activity {
    ImageButton ibEmployee,ibEmployer;
    private boolean backPressToExit;
    TextView aboutus;
```

This class is the hearth of the application. All the interactions between the graphical interface and the rest of the application must be making here. In addition, all widgets ID need to de defined here too. The android project can contain only one class who inherit from "Activity". The most important method in this class is:

```
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
```

This method is automatically called during the creation of the application. It is recommended to initialize all the application settings in "onCreate". One function permits programmers to make the link between this class and the widgets of the graphical interface seen above:

```
ibEmployee = (ImageButton) findViewById(R.id.ibEmployee);
ibEmployer = (ImageButton) findViewById(R.id.ibEmployer);
aboutus = (TextView) findViewById(R.id.tvaboutus);
```

With this method, we can interact with the Object button in the class. We can for example set the text in it. It is also possible to make this in "activity_main.xml" [16].

```
ibEmployee.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Intent intent = new Intent (MainActivity.this,Login.class);
          startActivity(intent);
       }
    });
```

The onClick method can set the actions will be taken by the widget when user click on it. Intent is the function to let application from this activity goes to the next activity.

2.5 Curriculum Vitae and Resume

A Curriculum Vitae (CV) is a written overview of a person's experience and qualifications. In some countries, CV is typically the first item that a potential employer encounters regarding the job seeker and use to screen applicants, often followed by an interview [17]. For example, university student need CV for their internship and job application to show personal details, working history, education background and qualification. Most of the time there will be many question marks what must a CV is needed, what's the template needed, and most of all what make the CV looks professional and leave a good impression to companies they wish to apply.

Resume, is a document used by persons to present their backgrounds and skills. Resumes can be used for a variety of reasons, but most often they are used to secure new employment. A typical resume contains "summary" of relevant job experience and education. The resume is usually one of the first items, along with a cover letter and sometimes an application for employment, which a potential employer sees regarding the job seeker and is typically used to screen applicants, often followed by an interview [18].

As a result, Curriculum Vitae (CV) used for academic purposes is more akin to the resume which means it is longer and more detailed than a resume. Nevertheless, a resume is shorter than CV or as summary version of one's education and experience. Both also can be used for a variety of reasons, but usually used for secure a new employment.

2.6 Unemployment Issue in Malaysia

Unemployment is an important issue facing in many developing countries. Country with high unemployment indicates that the country's labour resource is not fully utilized. Theoretically, a country that is not efficiently utilizing its resources does not achieve its maximum output. Hence, full employment need to be considered as macroeconomic goals if a country wants to maximize its output [19].

Labour market in Malaysia, February 2015

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April 2015

Indicator	Previous month			Same month of the previous year	
	February 2015	January 2015	Change (%)	February 2014	Change (%)
Labour force ('000)	14,119.2	14,043.6	0.5	13,887.3	1.7
Employed ('000)	13,664.3	13,601.6	0.5	13,440.9	1.7
Unemployed ('000)	454.9	442.0	2.9	446.4	1.9
Outside labour force ('000)	6,814.0	6,865.3	-0.7	6,720.3	1.4
Labour force participation rate (LFPR) (%)	67.4	67.2	0.2	67.4	-
Unemployment rate (%)	3.2	3.1	0.1	3.2	-
Seasonally adjusted					
Unemployment rate (%)	3.2	3.0	0.2	3.2	-

Figure 2.4 Statistics of Labour Market in Malaysia by Department of Statistics

As compared to other developing countries, Malaysia can be said to achieve full employment with unemployment rate of 3.2 % in February 2015 by Department of Statistics [20]. However, unemployment among graduates remains unsolved, where 65,500 graduates were recorded unemployed which is 16.7 % of the total unemployed labour in 2010 based on Department of Statistics, Malaysia.

Even though, the rate of unemployment in Malaysia decreased throughout the year, the number of unemployed graduate in Malaysia increased. Unemployment among graduates is not a new hot issue [21]. Therefore, this issue should be taken and solved immediately.

2.7 Comparison with Related Existing System

There are some other related existing systems such as JobStreet based mobile apps, Jobs in Malaysia, CVmaker, Smart Resume Builder, My Resume-CV builder and so on.

2.7.1 JobStreet

JobStreet is now the Southeast Asia's largest online employment company [22]. It contains large talent pool which consists with partner nationwide such as Malaysia, Philippine, Singapore and so on. The advantages of JobStreet mobile apps is can search and look for interesting jobs.

Figure 2.5 Logo of JobStreet mobile application

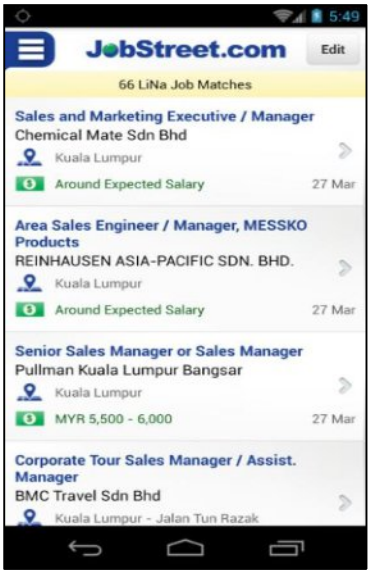

Figure 2.6 Interface of JobStreet mobile apps

However, it enable user to view and apply a vacancy without a proper resume or either using one. On the down side, vacancy only can be applied via website. Besides that, it provides insufficient detail from the company (For example, salary, working location and job scope).

2.7.2 Jobs in Malaysia

Jobs in Malaysia is a portal for job seeker and fresh graduate to search for vacancies. It assembles many vacancies from different employment website such as JobStreet, myStarJobs, JobsCentral and so on [23].

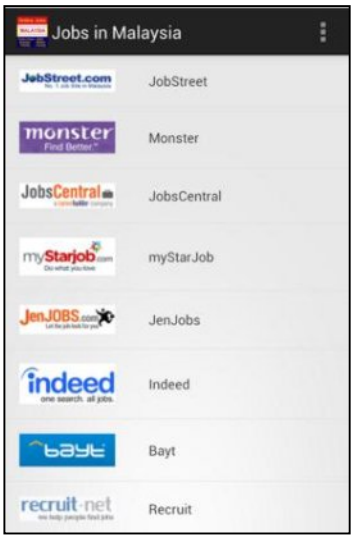

Figure 2.7 Interface of Jobs in Malaysia mobile apps

Yet, Jobs in Malaysia does not offer the option such as creating a resume. On top of that, it has insufficient details from the portal on how to apply and where to apply. This application is not applicable for users to submit their resume.

2.7.3 CVmaker / Smart Resume Builder / My Resume builder

Those mobile applications allows user to create their resumes [24]. These are good resume builder with several formats. In addition, it can generate resume in pdf format. However, those applications offer service solely on creating resume. There is no recruitment service in this application. Those applications are not applicable for users to submit their resume.

2.8 Conclusion

Mobile devices have become affordable and user friendly, nowadays nearly everyone has a mobile device or access to one. Thus, by developing a mobile application based Curriculum Vitae (CV); it will benefit everyone from all walks of life all at a touch of a button.

CHAPTER 3

METHODOLOGY

3.1 Introduction

In this chapter, the methodology used is even more detail and deeper. By using the Software Development Life Cycle (SDLC) as this project methodology, a standard and well organize system will be develop. SDLC phases involved in this project are planning, requirement analysis, design, coding, and testing. Maintenance is not involved since Click A Job is not implemented yet.

3.2 Project Methodology

Methodology to be used in the development of Click A Job will be SDLC. SDLC is a term used in systems engineering, information systems and software engineering to describe a process for planning, creating, testing, and deploying an information system [25].

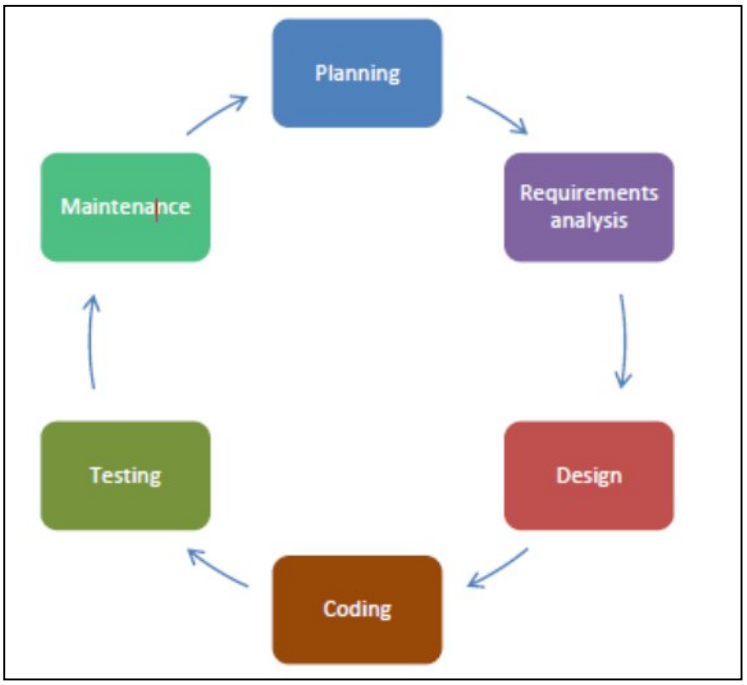

Figure 3.1 Cycle of the Software Development Life Cycle (SDLC)

Figure 3.1 shows the life cycle of the SDLC. It is used in this project as its project methodology. The database will change from time to time according to the project's business needs and current technology. Software Development Life Cycle (SDLC) in this project have in total five different phases [26] which are,

3.2.1 Planning

Firstly, the problem of related existing system such as Jobstreet, Jobs in Malaysia and MyResume builder are identified and objectives of developing Click A Job are proposed. Resources and related information are collect once the title is set. A proposal that meets requirement is prepared and reviewed with the supervisor. Project begin after determine the scope of project. Project timeline and gantt chart are produced [27]. Please refer Appendix B for details.

3.2.2 Requirements Analysis

In this phase, related information for this project such as platform to use in Click A Job development which is Android-based mobile application, [28] and weakness of related existing system are gathered. The need and priority option are designed through the use case diagram and flowchart. Analysis for Click A Job and hardware requirements were completed in this phase. A set of requirements are used as inputs into the design stages of system development. Requirements show what elements and functions are necessary for this project. Requirements also act as an important input into the verification process, since tests should trace back to specific requirements.

3.2.2.1 Software Requirements

The operating system for this mobile application in this project is Android OS. For developing this mobile application, Eclipse ADT (Android Development Tool) is used. Besides, there are a few languages used in this project which are Java, XML, PHP, JSON and MySQL. Software such as SDK manager, GenyMotionemulator and XAMPP played an important role in the development of this project. Moreover, mobile devices with Android v4.4 platform play the important role in developing this application.

(i) Java programming is used on this project. Java can work on all the operating system [29]. It is an object-oriented object. All the Java components are objects that interact with each other. Those objects are represented by classes. All classes have their own attributes and methods. Android applications are developed using the Java language.

Figure 3.2 shows Logo of Java Basics for Android Development.

After compile the Java codes and build process, result in package them for deployment on devices as **A**ndroid **P**ac**K**age files with an extension .apk. These formats not only include compiled Java code, but also any other resources, such as strings, images, or sound files, that the application requires to run as well as the Application Manifest file, AndroidManifest.xml. The Android Manifest file is a file required by all Android applications, which is used to define configuration details about the app [30].

(ii) Eclipse IDE is a free Integrated Development Environment implemented in Java. The first version was launched in 2001 by the eclipse foundation which includes important computers companies, such as IBM, Google or Oracle [31]. It has been created for Java development. Nowadays, Eclipse support more than 20 programming languages like C, XML, PHP, and so on. Eclipse includes a plugin created for android development, named ADT (Android Development Tool) [32]. Add to the Android Software Development Kit, Eclipse is a complete IDE to program android applications. The Android SDK includes all the android libraries, a debugger, an emulator to test the application, samples of code.

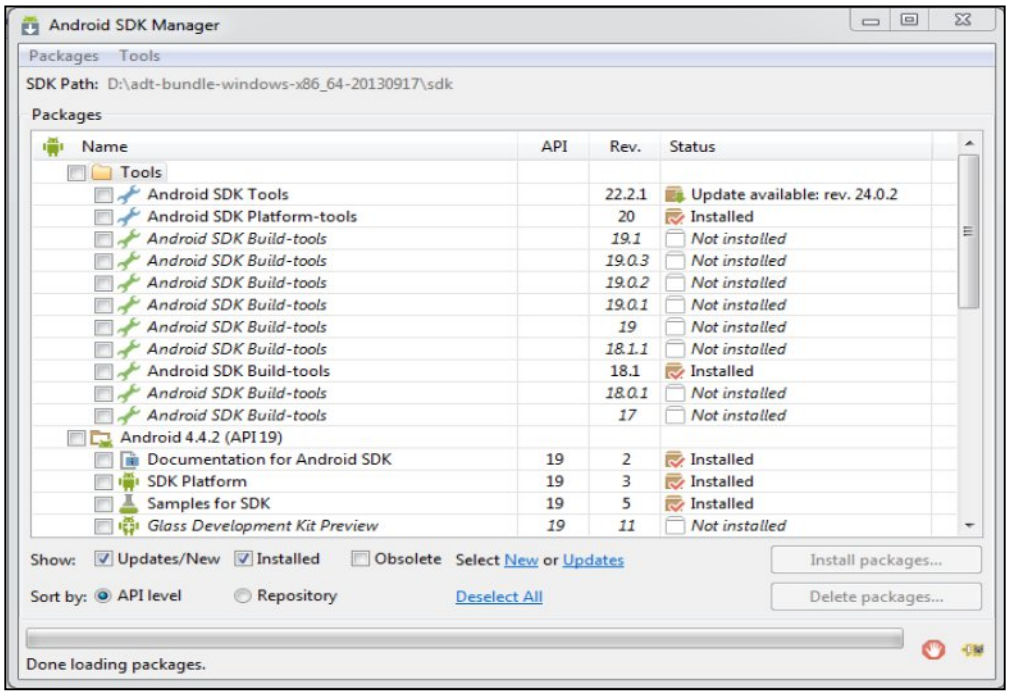

Figure 3.3: The Android SDK Manager for Eclipse.

(iii) XML language (Extensible Markup Language) is a computer markup language. It permits to organize information in a way that allows both computer and human to understand [33]. XML is a markup language much like HTML; it is used for

the internet. The informationis organized as a tree form. That means a XML file contain a root markup that includes all the other markups of the file. There is a real hierarchy of informations, always in the goal to organize those as well as possible. So, XML was designed to store and transport data, and it’s designed to be self- descriptive. XML language had been used in designing the layout activity of the mobile application [34].

(iv) PHP is a web programming language use to create web dynamic pages. It works on server side. PHP is server side scripting language designed for web development and is use as a general-purpose programming language [35]. The syntax in PHP is based on Perl, Java, and C. It is very good and powerful for creating dynamic content.

(v) JSON (JavaScript Object Notation) is a lightweight data-interchange format. It is easy for humans to read and write [36]. It is easy for machines to parse and generate. JSON is a text format that is completely language independent but uses conventions that are familiar to programmers of the C-family of languages, including C, C++, C#, Java, JavaScript, Perl, Python, and many others. These properties make JSON an ideal data-interchange language. JSON can be parsed and used by lots of programming languages and can be fetched with an XMLHttpRequestSON. JSON doesn't use end tag, shorter so it is quicker to read and write. The most important thing is JSON can use arrays and can be parsed by a standard JavaScript function.

(vi) GenyMotion emulator is the Android emulator for app testing and presentation. GenyMotion is one of the plugin for Eclipse and Android Studio [37]. It is compatible with all Android SDK tools. It has powerful features can be emulated and easy integration into testing of application and continuous integration server is simple and powerful. It is also containing developer tools such as command line tool, Java API, and Gradle plugin which can be developed in Android.

(vii) XAMPP is used as a server and database for storing resume and vacancy details and employee and employer details. XAMPP is an open source freeware that provided cross-platform web server solution. It consists of Apache HTTP Server, PHP and Perl interpreter scripts, and MySQL database. It can connect to phpMyAdmin too [38].

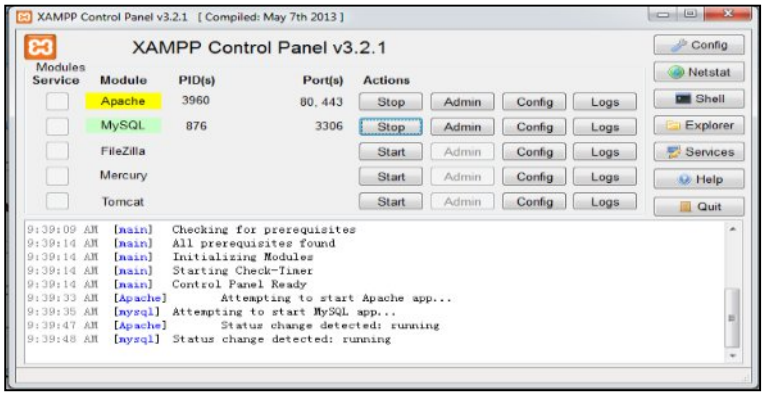

Figure 3.4 The XAMPP server control panel.

Figure 3.5 The phpMyAdmin

Thus, XAMPP is chosen in this project as a local-host server which also providing database service.

3.2.2.2 Hardware Requirements

The hardware requirement for develop this mobile application is ASUS A55V laptop with Intel Core i5-3210M processor with 4GB RAM and 64-bit Operating System that operates in Windows 7 Home Premium. For developing this mobile application, the hardware requirement is platform of mobile devices that use Android OS. Mobile phone with Android OS is important in system implementation to run the software. For instance, Xiaomi 3 with Quad core 2.3GHz with 2GB RAM and run on Android OS v4.4 (Kitkat) is using in developing Click A Job.

3.2.3 Design

In this phase, the preliminary sketches of Click A Job and interface design for the users (employee) and users (employer) are provided. The interface design is mobile friendly and responsive to mobile devices. Database structure and design of the network structure also has been determined [25].

3.2.4 Coding

For the coding phase as known as development phase, Java, XML, PHP and JSON have been selected as the main project coding language. Software components of Click A Job are built with the designed features and functions [25].

3.2.5 Testing

Alpha testing and beta testing are done to ensure the system run smoothly and functional. A good alpha testing sets well-defined benchmarks and measures a product against those benchmarks. For Beta testing, it explores the limits of a product by allowing users to explore every element of the system in their native environments [26]. Alpha testing is done by the developer and beta testing is done by the selected Click A Job users.

3.3 Conclusion

As a conclusion, Software Development Life Cycle (SDLC) have described each of the phase that involved in this system development. SDLC is the most suitable methodology to use for Click A Job development. Other than that, the Click A Job's software and hardware requirements are discussed in details.

CHAPTER 4

SYSTEM ANALYSIS AND DESIGN

4.1 Introduction

In this chapter, analysis and design of Click A Job will be discussed in details. Use case diagram is the best way to present how a user interacts with the system and depicting the specification of use case. Use case diagram able to show relationship between the user and the system [39]. Beside, flowchart is a type of diagram that will display all the processes of system implementation showing steps by steps of operations [40]. Database design is described by the entity-relationship (ER) diagram which stated the tables and variables of the database [41]. All the diagrams in this chapter are to provide an overview of Click A Job.

4.2 Use Case Diagrams

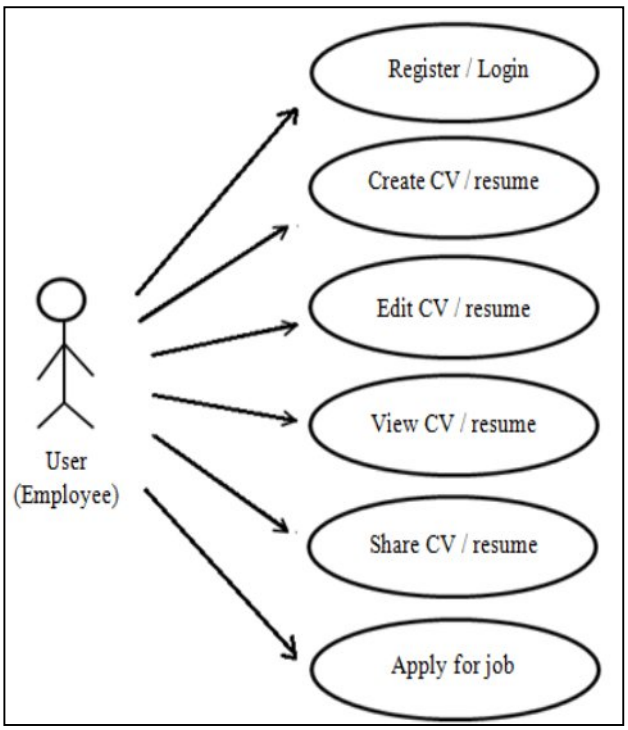

Figure 4.1 Use Case Diagram for users (Employee)

The Figure 4.1 shows the overall functions of the Click A Job that is only accessible by users (Employee). Employee can perform following function including register or login, create, edit, view, share CV or resume and apply for job. Employee requires create their CV or resume before they can share it or use it to apply for job. Logout function is also provided for employee to quit from the application.

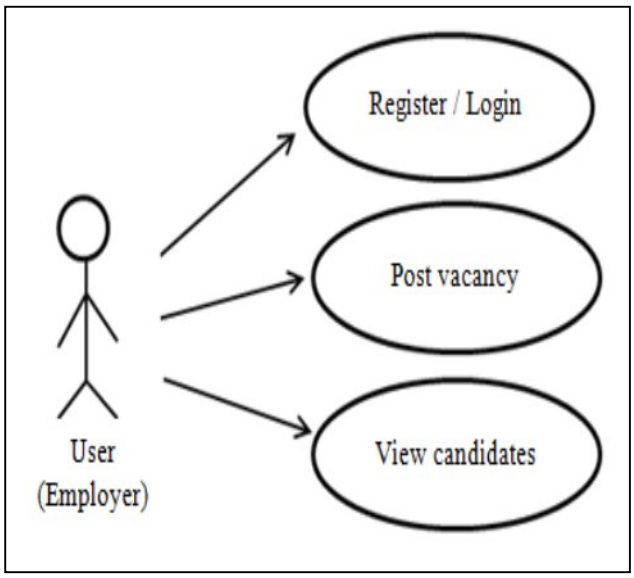

Figure 4.2 Use Case Diagram for user (Employer)

The Figure 4.2 shows the overall functions of the Click A Job that provided to the user (Employer). Employer can create vacancy that related to their company details through Click A Job. After that, employer can post vacancy and share it to employee. Employer can also trace the status of the vacancy by viewing the candidates. List of all candidates that had applied for the vacancy will be shown according to vacancy respectively.

4.3 Flowcharts

There are total of two flow charts which are flowchart for employee and employer modules are shown in the following.

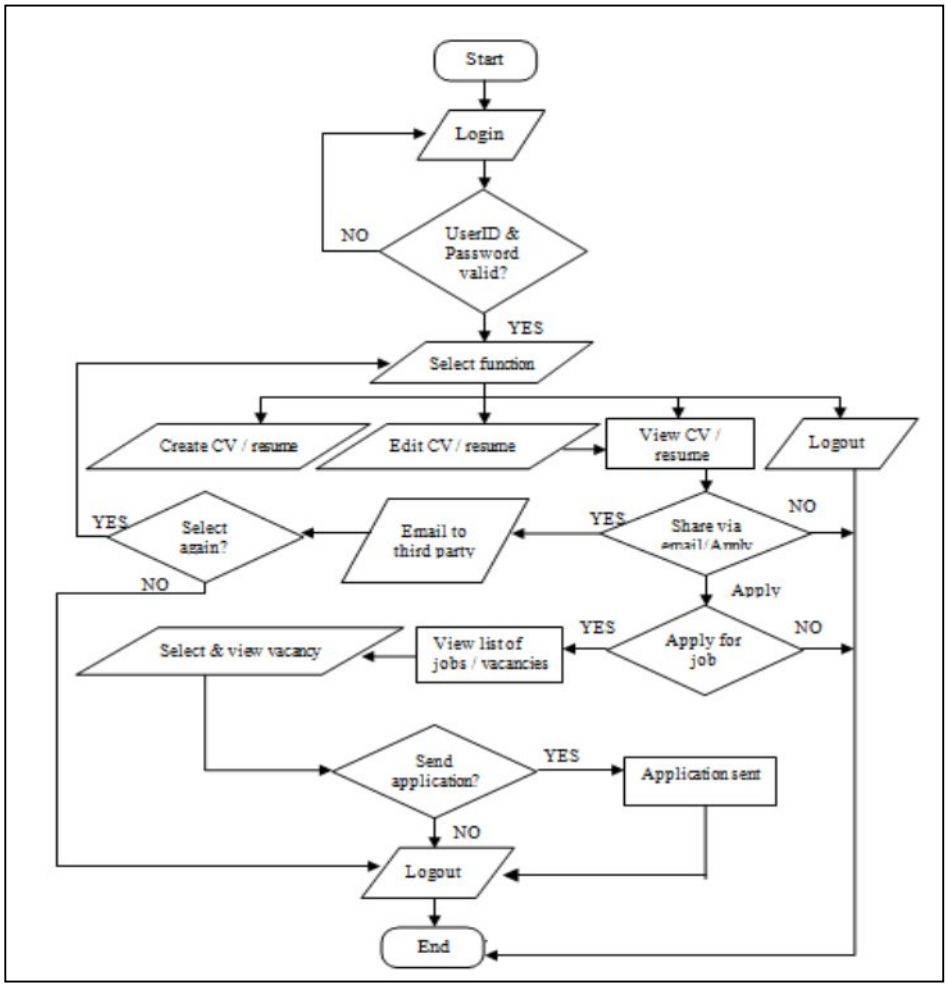

Figure 4.3 Flowchart for employee module

Figure 4.3 shows the flow chart for employee module. Employee have to login with valid username and password to Click A Job. There are few main functions which are create, edit, and view CV or resume that can be selected. Employee can select either one function to proceed. After CV or resume is completed, employee can choose whether share the resume via email or apply for job. If share via email is selected, employee can share their CV through email by entering the email address of third party. If apply for job is chosen, vacancy list will be shown and can send application according to different vacancy.

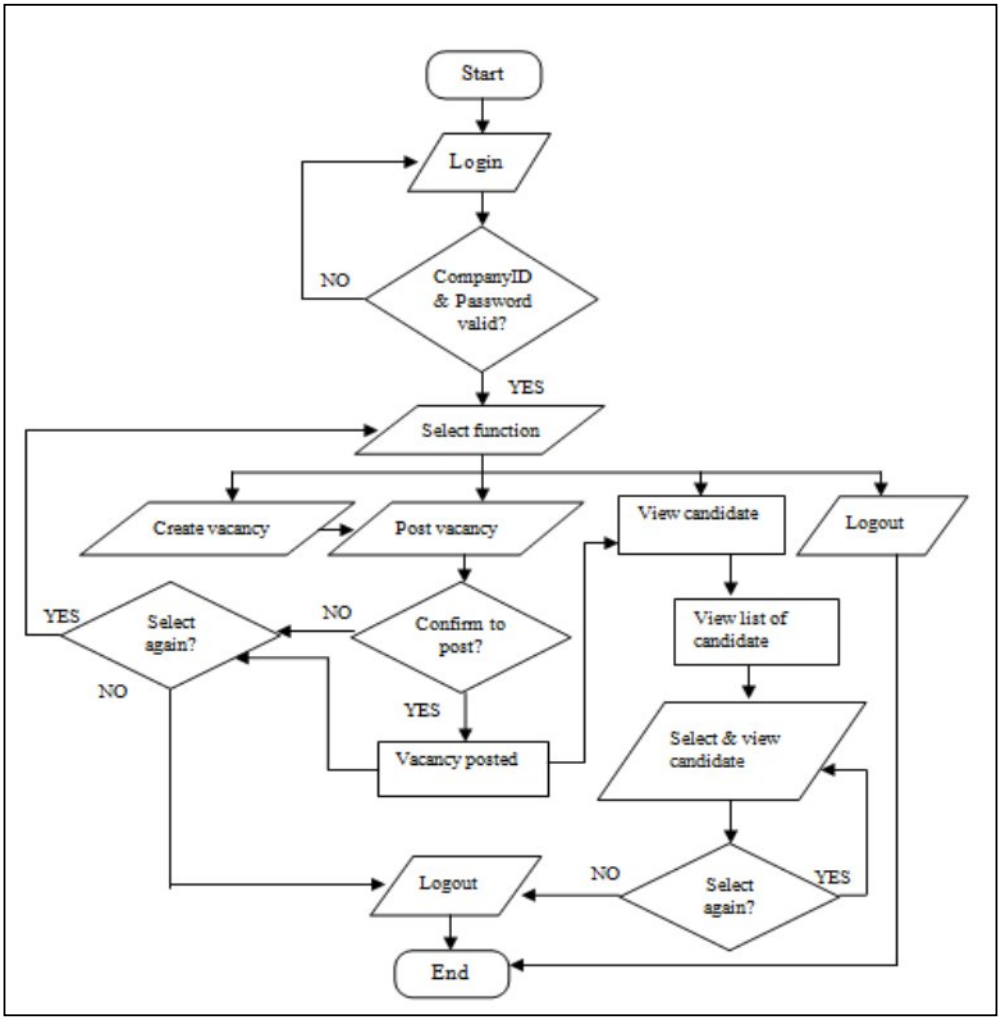

Figure 4.4 Flowchart for employer module

Figure 4.4 shows the flow chart for employer module. There are total of three functions available and login required. Employer can create vacancy and post it. By completing the vacancy form and submit to post, another user, employee can view the vacancy and apply for it. Thus, employer can also trace the status of vacancy with view candidates' function.

4.4 Entity-Relationship (ER) Diagram

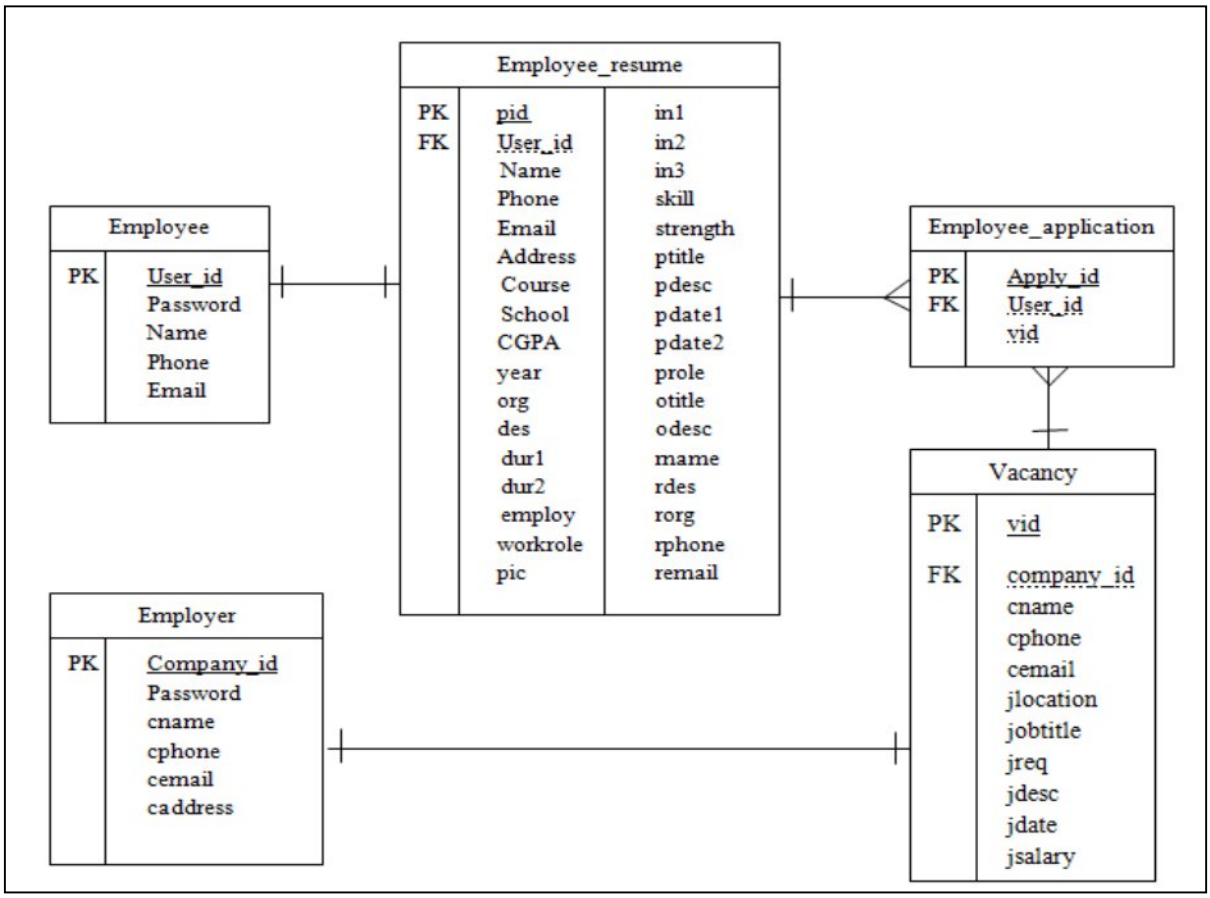

Figure 4.5 ER diagram for Click A Job

Figure 4.5 shows the ER diagram which represents the relationship between the tables in database. Table Employee is having a one-to-one relation to the table Employee_resume which means one employee can only own one resume. Besides, Table Employee_resume is having one-to-many relations to the table Employee_application which means an employee with a resume can apply for multiple vacancies. User_ID in the table Employee is the primary key and foreign key for the table Employee_resume and Employee_application. At the same time, table Employer is having a one-to-one relation to the table Vacancy. In table Vacancy, Company_ID is set as primary key. While table Vacancy has one-to-many relations to table Employee-application that means a vacancy can be applied for multiple times.

4.5 Database Design

Interface	Input Value	Input Name (Database)	Input Type
Employee			
Employee Register	User ID	id	varchar
	Password	psw	varchar
	Name	name	varchar
	Phone number	phone	int
	Email address	email	varchar
Employee Login	User ID	id	varchar
	Password	psw	varchar
Employee Resume			
Contact Information	Photo	pic	Long text
	Name	name	varchar
	Phone number	phone	int
	Email address	email	varchar
	Mailing address	address	varchar
Academic Details	Course / Degree	course	varchar
	University/ College/ School	school	varchar
	Result (Percentage/CGPA)	CGPA	varchar
	Graduation year	year	int
Work Experience	Organization/ Company	org	varchar
	Designation	des	varchar
	Duration (From)	dur1	varchar
	Duration (To)	dur2	varchar
	Employment (Previously/ Currently)	employ	varchar
	Working role	workrole	varchar

Interest and Skill	Field of interest 1	in1	varchar
	Field of interest 2	in2	varchar
	Field of interest 3	in3	varchar
	Skills	skill	varchar
	Strength	strength	Varchar
Project	Project title	ptitle	Varchar
	Description	pdesc	varchar
	Project duration (Start)	pdate1	varchar
	Project duration (Finish)	pdate2	varchar
	Project role	prole	varchar
Other	Title	otitle	varchar
	Description	odesc	varchar
Reference	Name	rname	varchar
	Designation	rdes	varchar
	Organization/ Company	rorg	varchar
	Phone number	rphone	int
	Email address	remail	Varchar
Employee Application			
Application	User ID	id	Varchar
	Vacancy ID	vid	Int

Table 4.1 Table of input design for User (Employee) of Click A Job

Table 4.1 shows the input design for the user (employee) on each interface. On the registration form, user requires to input the entire field. Next, for the resume form, users are encouraged to enter details and system will auto generate a resume ID which called “pid” (int) for each user. After that, vacancy with valid vacancy ID will be shown in list view. When user sent application based on the vacancy, User ID and vacancy ID will be passed by system and entered into database. This make employer can view employee’s resume if employee had applied for the certain vacancy.

Interface	Input Value	Input Name (Database)	Input Type
Employer			
Employer Register	Company ID/ Employer ID	cid	Varchar
	Password	cpsw	Varchar
	Name	cname	Varchar
	Phone number	cphone	Int
	Email address	cemail	Varchar
	Company address	caddress	Varchar
Employer Login	Company ID/ Employer ID	cid	Varchar
	Password	cpsw	Varchar
Employer vacancy			
Vacancy	Vacancy ID	vid	int (auto-increment)
	Company ID/ Employer ID	cid	Varchar
	Name	cname	Varchar
	Phone number	cphone	Int
	Email address	cemail	Varchar
	Working location	jlocation	Varchar
	Job title	jobtitle	Varchar
	Job requirements	jreq	Varchar
	Job description	jdesc	Varchar
	Expiration date	jdate	Varchar
	Salary	jsalary	Varchar

Table 4.2 Table of input design for User (Employer) of Click A Job

Table 4.2 shows the input design for the user (employer) on each interface. On the registration form, user requires to input the entire field. Next, for the login form, users are authenticated with Company ID or Employer ID to login. For posting the vacancy form, users are required to key in the entire field except cid because system will auto generate a

vacancy ID which called “cid” (int) for each vacancy. After that, vacancy with valid vacancy ID will be shown in list view. When user sent application, User ID and vacancy ID will be passed by system and entered into database. So, employer can view employee’s resume if employee had applied for the certain vacancy.

4.6 Summary

This chapter mainly describes the flows and processes of the system in details. The high level design of Click A Job such as database design and input design also explained in detail. This is following by implementation and testing of the system which will be discussed in chapter 5.

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Introduction

This chapter is discussed about system implementation which included network structure, database setup, and user interface of Click A Job. The sql query to connect MySQL database, retrieve, and store data into the database also explained in details in this chapter. In addition, the description of testing and results are also explained in details.

5.2 System Implementation

The network structure of how employee and employer access the Click A Job, connect to MySQL database that hosted by XAMPP and all the user interface of Click A Job are discussed in the following sub section.

5.2.1 Network Structure

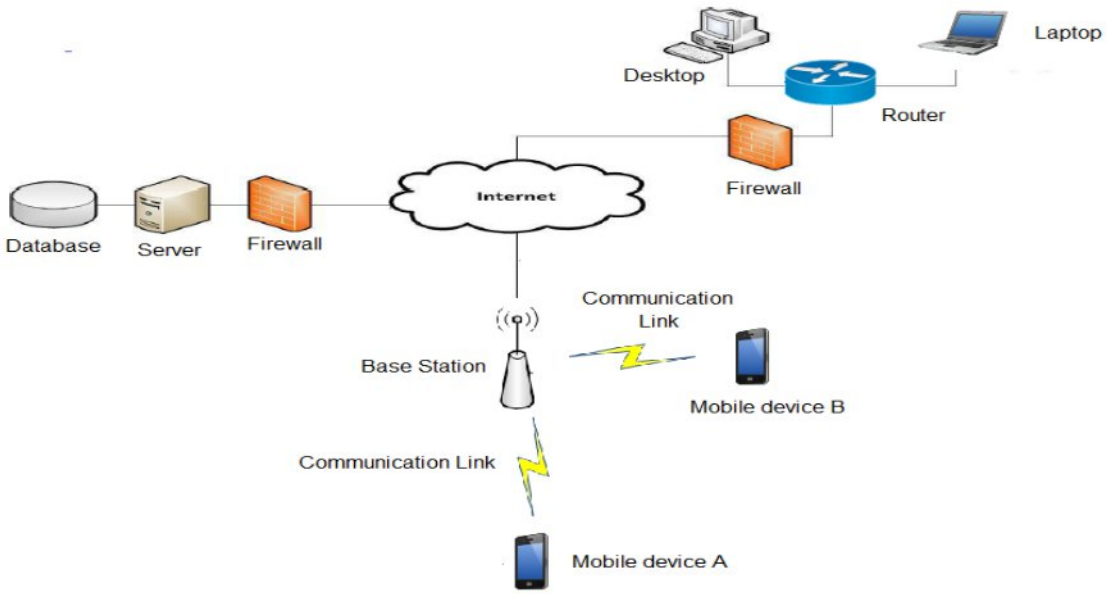

Figure 5.1 Network Architecture of Click A Job

Figure 5.1 shows the network architecture of Click A Job. Mobile devices, desktop, and laptop act as presentation layer for employee and employer to use the web application and mobile application through internet [42]. The database and server served as data source to keep the data for the Click A Job.

5.2.2 System Database

Database for this system is using PHP MySQL. To enter the database side, admin can go to this url (http://localhost/phpmyadmin/index.php). The database name is clickajob for this system development. There are five database table in this project which is employee, employer, employee_resume, vacancy and employee_application.

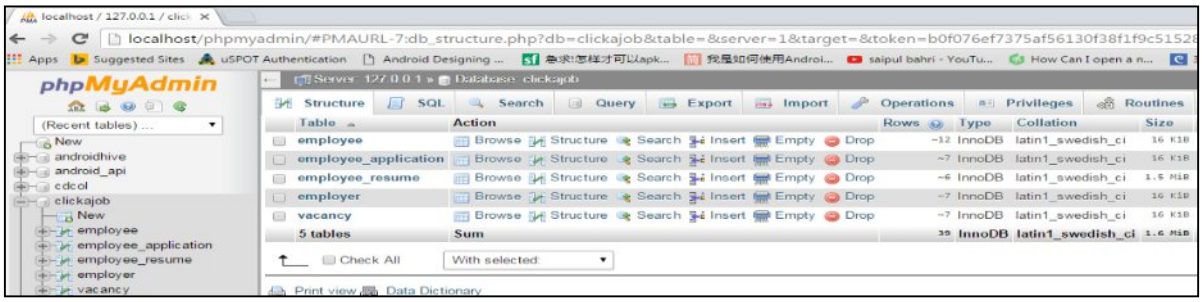

Figure 5.2 Database clickajob with its table name

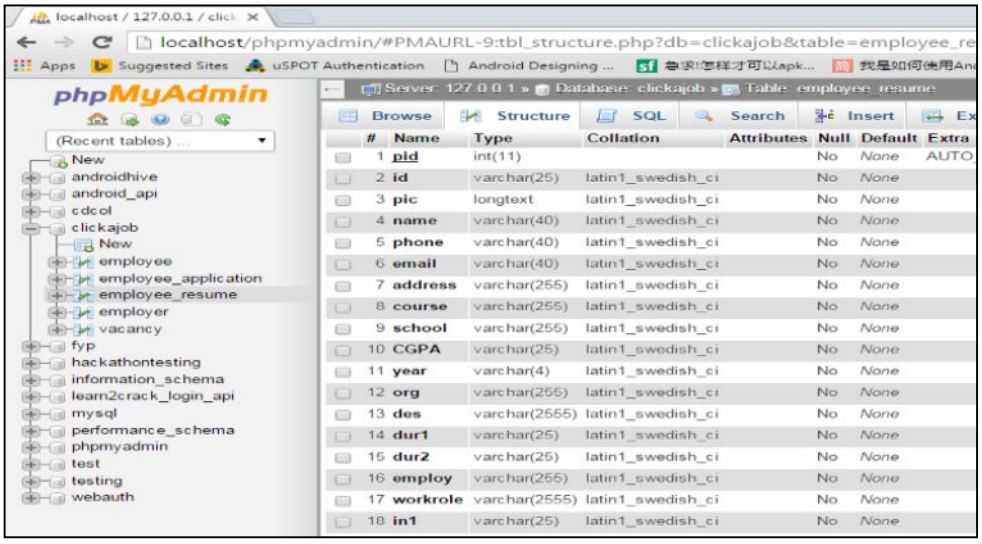

Figure 5.3 Structure of data in table (Employee_resume)

← T →	pid	id	pic	name	phone	email	address
Edit Copy Delete	1	eliekoo	iVBORw0KGgoAAAANSUhEUgAAAJ8AAADVCAIAAADGurW9AAAAA3...	Koo Sheng Kuan	0103924118	sinkun92@gmail.com	185, Jala Nawar, 3
Edit Copy Delete	2	izami	iVBORw0KGgoAAAANSUhEUgAAAJ4AAACzCAIAAAD31TLEAAAAA3...	AHMAD IZAMI ARIFF BIN MOHD HUSIN	012-5987810	izami5801@gmail.com	No. 332, 34600 K
Edit Copy Delete	3	kahliong	iVBORw0KGgoAAAANSUhEUgAAAIYAAAC8CAIAAAAy+kENAAAAA3...	Yap Kah Liong	011-10820926	yin_luv_liong@hotmail.com	43, JALA

Figure 5.4 Data in table (Employee_resume)

5.2.3 Database Setup and Connection

Connection establishment is essential to set up and open connection for MySQL database before employee and employer can access the data in database. A secure connection is needed for administrators to insert, retrieve, and display database records.

```php
<?php
 // Database configuration
define('DB_USERNAME', 'root');
define('DB_PASSWORD', '');
define('DB_HOST', 'localhost');
define('DB_NAME', 'clickajob');
?>
```

Figure 5.5 Config.php

```php
<?php
class DbConnect {
    private $conn;
    function __construct() {

        // connecting to database
        $this->connect();

    }
    function __destruct() {

        $this->close();
    }
    function connect() {
        require_once dirname(__DIR__) . '\clickajob\Config.php';
        $conn = mysql_connect(DB_HOST, DB_USERNAME, DB_PASSWORD) or die(mysql_error());
       // get host name, username and password from Config.php file

        $db = mysql_select_db(DB_NAME) or die(mysql_error()); // get database name from Config.php

        return $conn; // return connection resource
    }
     // Close function
    function close() {
        // close db connection
        mysql_close();
    }
}
?>
```

Figure 5.6 Db_connect.php

Connection to database of Click A Job has been made by Config.php and Db_connect.php. It's using localhost, user as root, no password is needed, and database name is clickajob. If Click A Job is implemented in server, the 'localhost' in $server_name will replace by the IP address of that server.

5.2.3.1 Database Query

A select query is simply a data retrieval query. An action query can ask for additional operations on the data, such as insertion, updating, or deletion. Languages used to interact with databases are called query languages, of which the Structured Query Language (SQL) is the well-known standard [43]. There are some different queries had been used in developing Click A Job based on using PHP language.

5.2.4 Connection in mobile apps to database

There are two main functions that need to connect to database. First function is insert data into database or called as POST function, second function is GET function which is get data from database to show in mobile application [44]. In developing this application, there are two types of POST function implemented depends on the situation. First type of POST function is simple POST which is only insert one or little data into database. For example in this project, employee register is only inserting some data. Compared to employee resume, there are large amounts that need to be inserted into database, so the coding is more complicated. At the same time, there are two types of GET functions had been implemented too which are simple and complicated. Simple GET function only retrieve one row of data in the table of database while complicated GET function is retrieve a large amount of data which means JSON is needed to retrieve the data [45].

5.2.4.1 Simple POST function

Employee Registration

Register.java

```
package com.example.clickajob;

import java.io.IOException;
import java.util.ArrayList;
import java.util.List;

import org.apache.http.HttpEntity;
import org.apache.http.HttpResponse;
import org.apache.http.NameValuePair;
import org.apache.http.client.ClientProtocolException;
import org.apache.http.client.HttpClient;
import org.apache.http.client.entity.UrlEncodedFormEntity;
import org.apache.http.client.methods.HttpPost;
import org.apache.http.impl.client.DefaultHttpClient;
import org.apache.http.message.BasicNameValuePair;
```

Figure 5.7 Main import to open http connection in mobile application

Register.java

```
private void insertToDatabase(){
        class SendPostReqAsyncTask extends AsyncTask<String, Void, String> {
            @Override
            protected String doInBackground(String... params) {

                String names = name.getText().toString();
                String phone = pnum.getText().toString();
                String emails = email.getText().toString();
                String ids = id.getText().toString();
                String password = pwd.getText().toString();


                List<NameValuePair> nameValuePairs = new ArrayList<NameValuePair>();
                nameValuePairs.add(new BasicNameValuePair("name", names));
                nameValuePairs.add(new BasicNameValuePair("phone", phone));
                nameValuePairs.add(new BasicNameValuePair("email", emails));
                nameValuePairs.add(new BasicNameValuePair("id", ids));
                nameValuePairs.add(new BasicNameValuePair("password", password));

                try {
                    HttpClient httpClient = new DefaultHttpClient();
                    HttpPost httpPost = new HttpPost(
                            "http://192.168.43.78/clickajob/register.php");
                    httpPost.setEntity(new UrlEncodedFormEntity(nameValuePairs));

                    HttpResponse response = httpClient.execute(httpPost);

                    HttpEntity entity = response.getEntity();


                } catch (ClientProtocolException e) {

                } catch (IOException e) {

                }
                return "success";
            }
```

Figure 5.8 insertToDatabase( ) function in Register.java

First, there are some String values had been defined by getText().toString coding. The data gained from EditText which is user input and converted into String. Then, ArrayList of table had been declared. After that,

“nameValuePairs.add(**new** BasicNameValuePair("name", names));”

which mean the values is added into database by the coding of

“HttpPost httpPost =**new** HttpPost ("http://192.168.43.78/clickajob/register.php");

httpPost.setEntity(**new** UrlEncodedFormEntity(nameValuePairs));”

using PHP file that located at “xampp/htdocs” folder which is act as localhost..

```php
<?php
define('HOST','localhost');
  define('USER','root');
  define('PASS','');
  define('DB','clickajob');
  $con = mysqli_connect(HOST,USER,PASS,DB);

$name = $_POST['name'];
$phone = $_POST['phone'];
$email = $_POST['email'];
$id = $_POST['id'];
$password = $_POST['password'];


$sql = "insert into employee (name,phone,email,id, password) values
('$name','$phone','$email','$id','$password')";

  if(mysqli_query($con,$sql)){
    echo 'success';
  }
  else{
    echo 'failure';
  }
  mysqli_close($con);
?>
```

Figure 5.9 register.php

Query of employee register is shown as below:

```
$sql = "insert into employee (name,phone,email,id, password) values
('$name','$phone','$email','$id','$password')";
```

Data will firstly be inserted by using INSERT statement. After the application is linked with the MySQL database, data will store into the table in database.

5.2.4.2 Simple GET function from database

Employee Login

There is a background task for employee login. If employee select “Login” method, the coding will called this background task to open connection and try to get the values of data from database.

Register.java | Login.java | BackgroundTask.java

```
import android.os.AsyncTask;
import java.io.BufferedReader;
import java.io.BufferedWriter;
import java.io.IOException;
import java.io.InputStream;
import java.io.InputStreamReader;
import java.io.OutputStream;
import java.io.OutputStreamWriter;
import java.net.HttpURLConnection;
import java.net.MalformedURLException;
import java.net.URL;
import java.net.URLEncoder;

public class BackgroundTask extends AsyncTask<String,Void,String> {

    @Override
    protected String doInBackground(String... params) {
        String login_url = "http://192.168.43.78/clickajob/login.php";
//       String login_url = "http://172.30.144.220/clickajob/login.php";
        String method = params[0];

        if(method.equals("login"))
        {
           String login_name = params[1];
            String login_pass = params[2];
            try {
                URL url = new URL(login_url);
                HttpURLConnection httpURLConnection = (HttpURLConnection)url.openConnection();
                httpURLConnection.setRequestMethod("POST");
                httpURLConnection.setDoOutput(true);
                httpURLConnection.setDoInput(true);
                OutputStream outputStream = httpURLConnection.getOutputStream();
                BufferedWriter bufferedWriter = new BufferedWriter(new OutputStreamWriter(outputStream,"UTF-8"));
                String data = URLEncoder.encode("login_name","UTF-8")+"="+URLEncoder.encode(login_name,"UTF-8")+"&"+
                    URLEncoder.encode("login_pass","UTF-8")+"="+URLEncoder.encode(login_pass,"UTF-8");
                bufferedWriter.write(data);
                bufferedWriter.flush();
                bufferedWriter.close();
                outputStream.close();

                InputStream inputStream = httpURLConnection.getInputStream();
                BufferedReader bufferedReader = new BufferedReader(new InputStreamReader(inputStream,"iso-8859-1"));
                String response = "";
                String line  = "";
                while ((line = bufferedReader.readLine())!=null)
                {
                    response+= line;
                }
                bufferedReader.close();
                inputStream.close();
                httpURLConnection.disconnect();
                return response;


            } catch (MalformedURLException e) {
                e.printStackTrace();
            } catch (IOException e) {
                e.printStackTrace();
            }


        }
        return null;
    }
```

Figure 5.10 BackgroundTask.java for Employee Login

Register.java | Login.java

```
public void onClick(View view) {
    if(verify(userid.getText().toString(),pwd.getText().toString())){

        String method = "login";
//      BackgroundTask backgroundTask = new BackgroundTask(Login.this);
        BackgroundTask backgroundTask = new BackgroundTask();
//      backgroundTask.execute(method,id.getText().toString(),pwd.getText().toString());
        try {
            String reply = backgroundTask.execute(method,userid.getText().toString(),pwd.getText().toString()).get();
            String x = reply.trim().substring(0, 1);

            dialog = new ProgressDialog(Login.this);
            dialog.setTitle("Please wait...");
            dialog.setMessage("Logging in...");
            dialog.setIndeterminate(false);
            dialog.setCancelable(true);
            dialog.show();

            if(x.equals("y")){
                Editor editor = pref.edit();
                editor.putString("userid", userid.getText().toString());
                editor.putString("pwd", pwd.getText().toString() );

                editor.commit();

                String id = userid.getText().toString();
                showMsg( id + ", Welcome back!");
                Intent intent = new Intent(Login.this, EmployeeMain.class);
                intent.putExtra("userid", id);
//              showMsg(id);
                startActivity(intent);
            }
            else if (x.equals("n")){
                showMsg("Login Error. Please check your ID and password.");
            }

        } catch (InterruptedException e) {
            // TODO Auto-generated catch block
```

Figure 5.11 Login.java

```
<?php
require "init.php";
$user_name = $_POST["login_name"];
$user_pass =  $_POST["login_pass"];
$sql_query = "select name from employee where id = '$user_name' and password = '$user_pass';";
$result = mysqli_query($con,$sql_query);
if(mysqli_num_rows($result) >0 )
{
$row = mysqli_fetch_assoc($result);
$name =$row["name"];
echo "y";
}
else
{
echo "n";
}
?>
```

Figure 5.12 Login.php

Query of employee login is shown as below:

```
$sql_query = "select name from employee where id = '$user_name' and password = '$user_pass';";
```

The sql query SELECT is used to retrieve data from database by restricting to the condition using WHERE clause. Example above is only retrieving the data that having the same ID and same password as user input.

5.2.4.3 Complicated POST function

Create Employee Resume

Register.java | Login.java | BackgroundTask.java | EmployeeResume.java | EmployeeView.java

```
    private void insertToDatabase() {

        class SendPostReqAsyncTask extends AsyncTask<String, Void, String> {
            @Override
            protected String doInBackground(String... params) {


                List<NameValuePair> nameValuePairs = new ArrayList<NameValuePair>();

                nameValuePairs.add(new BasicNameValuePair("id", id));
                nameValuePairs.add(new BasicNameValuePair("pic", pic));
                nameValuePairs.add(new BasicNameValuePair("name", name));
                nameValuePairs.add(new BasicNameValuePair("phone", phone));
                nameValuePairs.add(new BasicNameValuePair("email", email));
                nameValuePairs.add(new BasicNameValuePair("address", address));
                nameValuePairs.add(new BasicNameValuePair("course", course));
                nameValuePairs.add(new BasicNameValuePair("school", school));
                nameValuePairs.add(new BasicNameValuePair("CGPA", CGPA));
                nameValuePairs.add(new BasicNameValuePair("year", year));
                nameValuePairs.add(new BasicNameValuePair("org", org));
                nameValuePairs.add(new BasicNameValuePair("des", des));
                nameValuePairs.add(new BasicNameValuePair("dur1", dur1));
                nameValuePairs.add(new BasicNameValuePair("dur2", dur2));
                nameValuePairs.add(new BasicNameValuePair("employ", employ));
                nameValuePairs.add(new BasicNameValuePair("workrole", workrole));
                nameValuePairs.add(new BasicNameValuePair("in1", in1));
                nameValuePairs.add(new BasicNameValuePair("in2", in2));
                nameValuePairs.add(new BasicNameValuePair("in3", in3));
                nameValuePairs.add(new BasicNameValuePair("skill", skill));
                nameValuePairs.add(new BasicNameValuePair("strength", strength));
                nameValuePairs.add(new BasicNameValuePair("ptitle", ptitle));
                nameValuePairs.add(new BasicNameValuePair("pdesc", pdesc));
                nameValuePairs.add(new BasicNameValuePair("pdate1", pdate1));
                nameValuePairs.add(new BasicNameValuePair("pdate2", pdate2));
                nameValuePairs.add(new BasicNameValuePair("prole", prole));
                nameValuePairs.add(new BasicNameValuePair("otitle", otitle));
                nameValuePairs.add(new BasicNameValuePair("odesc", odesc));
                nameValuePairs.add(new BasicNameValuePair("rname", rname));
                nameValuePairs.add(new BasicNameValuePair("rdes", rdes));
                nameValuePairs.add(new BasicNameValuePair("rorg", rorg));
                nameValuePairs.add(new BasicNameValuePair("rphone", rphone));
                nameValuePairs.add(new BasicNameValuePair("remail", remail));

                try {
                    HttpClient httpClient = new DefaultHttpClient();
                    HttpPost httpPost = new HttpPost(
                            "http://192.168.43.78/clickajob/resume.php");
                    httpPost.setEntity(new UrlEncodedFormEntity(nameValuePairs));
                    HttpResponse response = httpClient.execute(httpPost);
                    HttpEntity entity = response.getEntity();

                } catch (ClientProtocolException e) {
                    showMsg("ERROR");
                } catch (IOException e) {
                    showMsg("ERROR");
                }
                return "success";
            }

            @Override
            protected void onPostExecute(String result) {
                super.onPostExecute(result);
                if(result == "success"){
                    showMsg("Create resume successfully.");
                }
                else if(result == "failure"){
                    showMsg("Error create resume.");
                }

            }
        }
        SendPostReqAsyncTask sendPostReqAsyncTask = new SendPostReqAsyncTask();
        sendPostReqAsyncTask.execute();
    }
```

Figure 5.13 EmployeeView.java which contain insert resume details into database

Query of employee resume is shown as below:

```
$sql = "insert into employee_resume (id, pic,  name, phone, email, address, course,
        school, CGPA, year ,org, des,dur1 ,dur2,employ,workrole, in, in2, in3, skill,
strength,  ptitle, pdesc, pdate,  pdate2, prole, otitle, odesc , rname , rdes , rorg,
rphone , remail) values
('$id','$pic',  '$name','$phone','$email','$address','$course','$school','$CGPA','$year',
'$org','$des','$dur1','$dur2','$employ','$workrole','$in1','$in2','$in3' ,'$skill','$strength',
'$ptitle', '$pdesc', '$pdate1','$pdate2','$prole','$otitle', '$odesc', '$rname', '$rdes',
'$rorg', '$rphone', '$remail')";
```

There are totally 33 data that need to be inserted into table of employee_resume. After the application is linked with the MySQL database, data will store into the table in database.

5.2.4.4 Complicated GET function by Using JSON

Get resume details from database

In Ecplise ADT, the connection to database had been open by import Apache and JSON library into the coding.

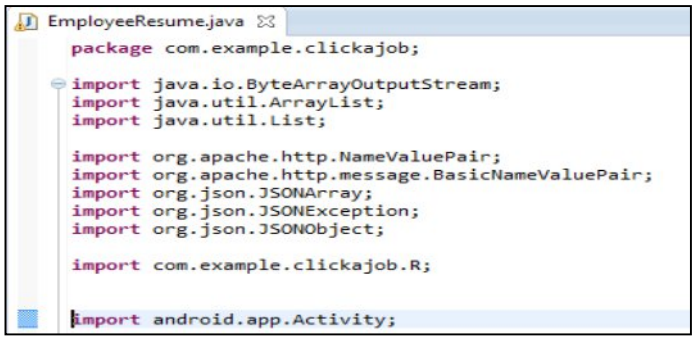

Figure 5.14 shows the related import in the coding.

Next, url connect to database table is defined as url_resume_details, there are a fixed IP address used to connect to the PHP file that located at “xampp/htdocs” folder which is act as localhost.

EmployeeResume.java

```
package com.example.clickajob;

import java.io.ByteArrayOutputStream;

public class EmployeeResume extends Activity {

    SharedPreferences pref;
    TextView textview1, textview2, textview3, textview4, textview5, textview6, textview18, textview8, textview9,textview19, textview10
    TextView textview20, textview21, textview22, textview23,textview24,textview25,textview26, textview27, textview28,textview29, textv
    ImageView userpic;

    String pid;

    // Progress Dialog
    private ProgressDialog pDialog;

    // JSON parser class
    JSONParser jsonParser = new JSONParser();


    private static final String url_resume_details = "http://192.168.43.78/clickajob/get_resume_details.php";
```

Figure 5.15 Connection in mobile application to database

EmployeeResume.java

```
        /**
         * Getting product details in background thread
         * */
        protected String doInBackground(String... paramss) {

            // updating UI from Background Thread
//          runOnUiThread(new Runnable() {
//              public void run() {
                    // Check for success tag
                    int success;
                    try {
                        // Building Parameters
                        List<NameValuePair> params = new ArrayList<NameValuePair>();
                        params.add(new BasicNameValuePair("pid", pid));

                        // getting product details by making HTTP request
                        // Note that product details url will use GET request
                        JSONObject json = jsonParser.makeHttpRequest(
                                url_product_detials, "GET", params);

                        // check your log for json response
                        Log.d("Single Resume Details", json.toString());

                        // json success tag
                        success = json.getInt(TAG_SUCCESS);
                        if (success == 1) {
                            // successfully received product details
                            JSONArray productObj = json
                                    .getJSONArray(TAG_PRODUCT); // JSON Array

                            // get first product object from JSON Array
                            final JSONObject product = productObj.getJSONObject(0);

                            runOnUiThread(new Runnable() {
                                public void run() {
```

Figure 5.16 AsynTask doInBackground () is the function of the connection to database doing in background

```php
<?php
// array for JSON response
$response = array();

// include db connect class
require_once __DIR__ . '/db_connect.php';

// connecting to db
$db = new DbConnect();

// check for post data
if (isset($_GET["pid"])) {
    $pid = $_GET['pid'];

    // get a resume from resume/product table
    $result = mysql_query("SELECT * FROM employee_resume WHERE pid = $pid");

    if (!empty($result)) {
        // check for empty result
        if (mysql_num_rows($result) > 0) {

            $result = mysql_fetch_array($result);

            $product = array();

            $product["pid"] = $result["pid"];
            $product["id"] = $result["id"];
            $product["pic"] = $result["pic"];
            $product["name"] = $result["name"];
            $product["phone"] = $result["phone"];
            $product["email"] = $result["email"];
            $product["address"] = $result["address"];
            $product["course"] = $result["course"];
            $product["school"] = $result["school"];
            $product["CGPA"] = $result["CGPA"];
            $product["year"] = $result["year"];
            $product["org"] = $result["org"];
            $product["des"] = $result["des"];
            $product["dur1"] = $result["dur1"];
            $product["dur2"] = $result["dur2"];
            $product["employ"] = $result["employ"];
```

```php
            $product["employ"] = $result["employ"];
            $product["workrole"] = $result["workrole"];
            $product["in1"] = $result["in1"];
            $product["in2"] = $result["in2"];
            $product["in3"] = $result["in3"];
            $product["skill"] = $result["skill"];
            $product["strength"] = $result["strength"];
            $product["ptitle"] = $result["ptitle"];
            $product["pdesc"] = $result["pdesc"];
            $product["pdate1"] = $result["pdate1"];
            $product["pdate2"] = $result["pdate2"];
            $product["prole"] = $result["prole"];
            $product["otitle"] = $result["otitle"];
            $product["odesc"] = $result["odesc"];
            $product["rname"] = $result["rname"];
            $product["rdes"] = $result["rdes"];
            $product["rorg"] = $result["rorg"];
            $product["rphone"] = $result["rphone"];
            $product["remail"] = $result["remail"];
```

```
            // success
            $response["success"] = 1;

            // user node
            $response["product"] = array();

            array_push($response["product"], $product);

            // echoing JSON response
            echo json_encode($response);
        } else {
            // no product found
            $response["success"] = 0;
            $response["message"] = "No product found";

            // echo no users JSON
            echo json_encode($response);
        }
    } else {
        // no product found
        $response["success"] = 0;
        $response["message"] = "No product found";

        // echo no users JSON
        echo json_encode($response);
    }
} else {
    // required field is missing
    $response["success"] = 0;
    $response["message"] = "Required field(s) is missing";

    // echoing JSON response
    echo json_encode($response);
}
?>
```

Figure 5.17 get_resume_details.php

Query and result of get resume details is shown as below:

```
$result = mysql_query("SELECT * FROM employee_resume WHERE pid = $pid");
```

The sql query SELECT is used to retrieve data from database. It's using JSON parser to parse and structure the data then only pass data back from database to the mobile application.

5.3 Click A Job Interface

5.3.1 Icon of Click A Job

Figure 5.3.1 shows the icon of Click A Job

Figure 5.3.1 shows the logo of Click A Job. The document in the picture represent as a resume of an employee (looking or applying for job vacancies) and the magnifier represents as a employer or company looking for their candidates.

5.3.1.1 Loading Page

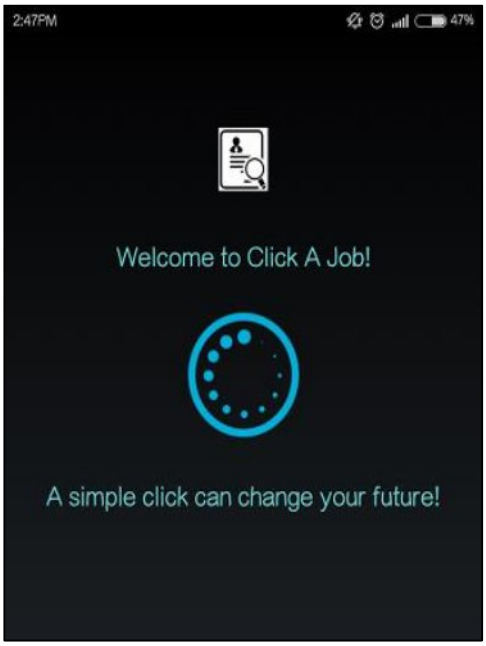

Figure 5.3.2 Loading page

Figure 5.3.2 is the loading page when users select Click A Job mobile app. This page will be loaded in 3 seconds before they can enter login page.

5.3.2 Main Activity of Click A Job

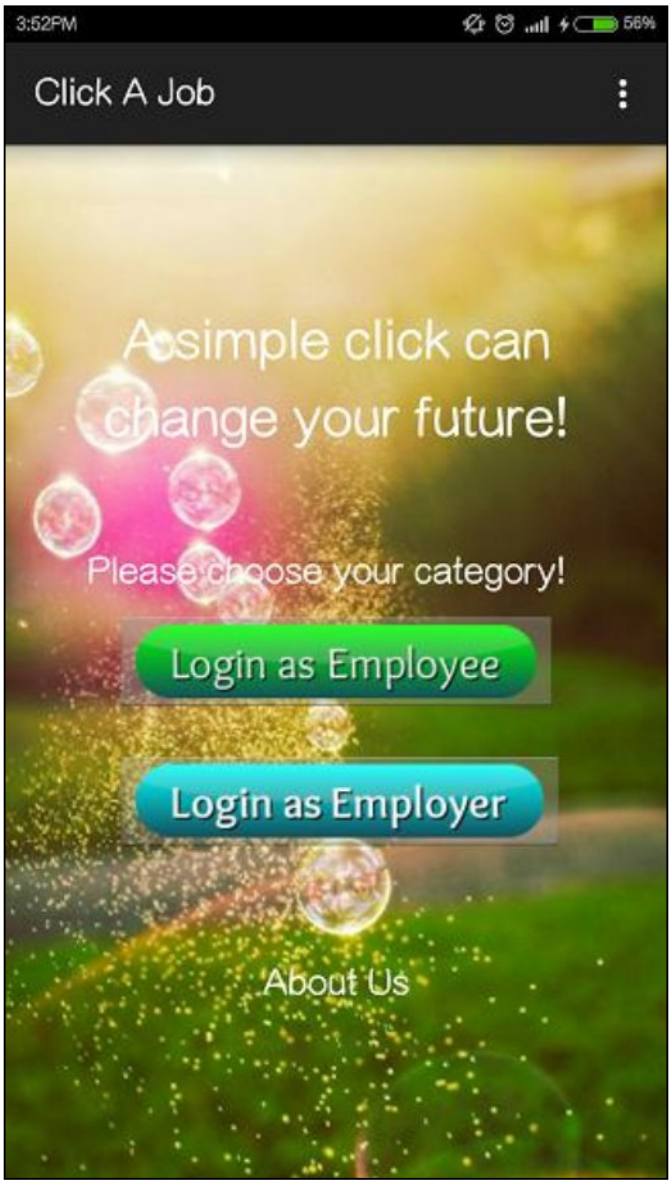

Figure 5.3.3 shows main activity of Click A Job

After the loading page, main activity of Click A Job will appear. There are three button that can be selected which are green button as “Login as employee”, blue button “Login as Employer” and “About Us”. There are two categories of users which are “Employee” and “Employer”. The main activity of Click A Job will allows users to choose their categories here.

5.3.3 About Us

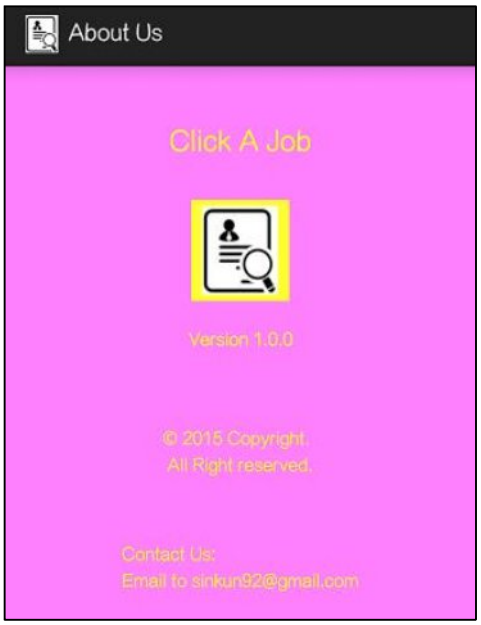

Figure 5.3.4 shows About Us page.

Before select category of login, users can view our details by click the “About Us” button at the previous activity.

5.3.4 Employee Part

(i) Employee Part - Login As Employee

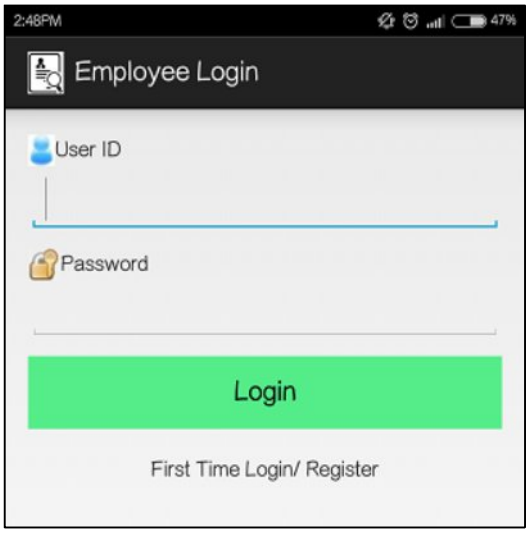

Figure 5.3.5 shows employee login interface.

Figure above is the login activity of Click A Job for user Employee. They can login by enter their correct User ID and Password then click the green “Login” button. If they had no account yet, they might click on “First Time Login/ Register” to register a new account.

(ii) Employee Part – Register and Login

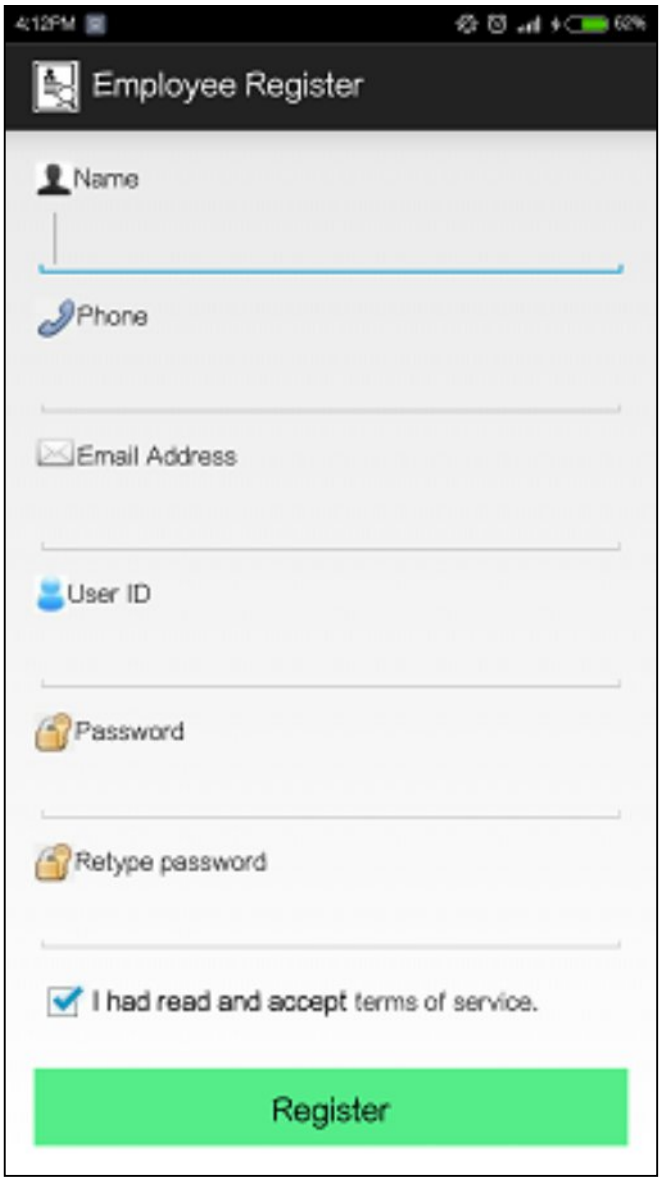

Figure 5.3.6 Registration page of employee

User (Employee) can register a new account by enter numerous information like name, phone number, email address, User ID, password and confirm password.

(iii) Terms of service

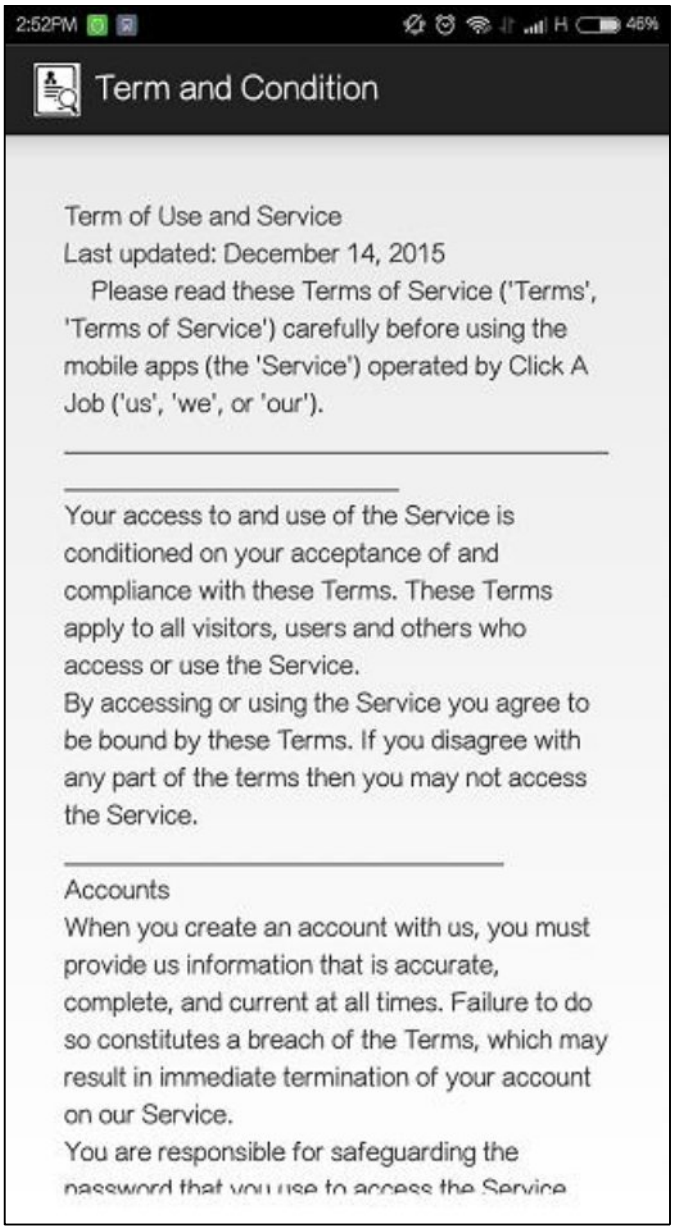

Figure 5.3.7 Term and Condition of Click A Job

Users can view our terms of use and service by scroll this page. They can click BACK to exit this page and go to previous which is register page.

(iv) **Employee part – Main Page of Employee**

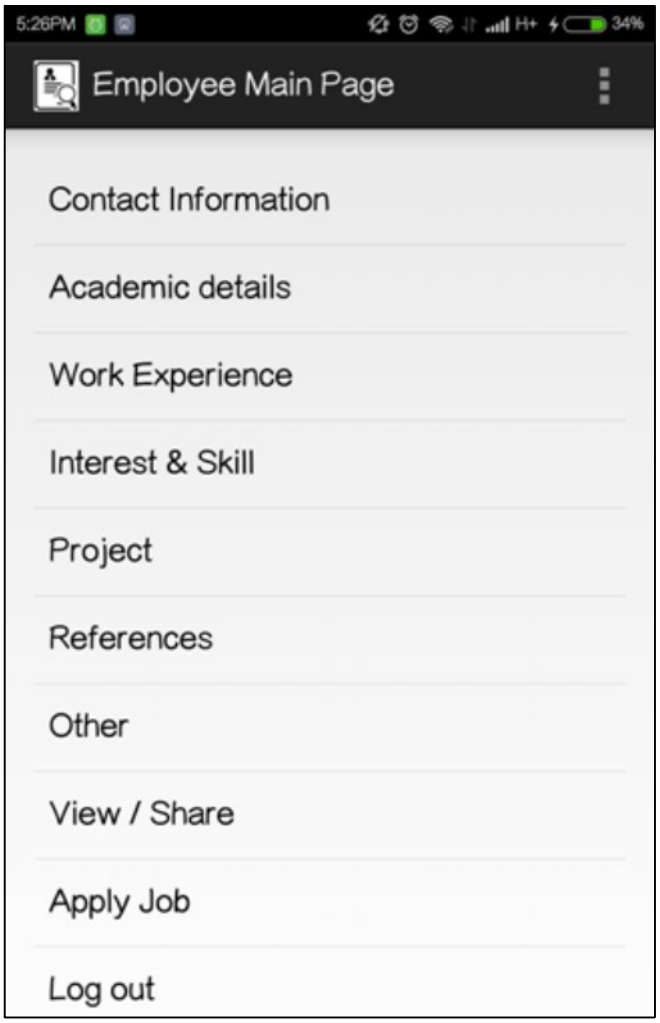

Figure 5.3.8 Employee Main Page.

This is the main page of employee. They can edit their resume by select resume parts which are Contact Information, Academic Details, Work Experience, Interest & Skill, Project, Reference, and Other. After that, they can choose to view and create their resume by select “View/ Share”. They can also share their resume through Email. Then, they can go for “Apply Job” to view the vacancy lists. The last function for users is Logout.

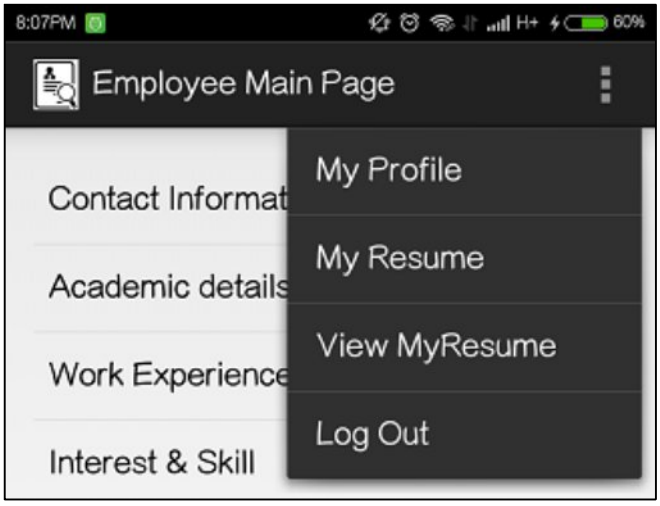

Figure 5.3.9 shows menu of employee main page.

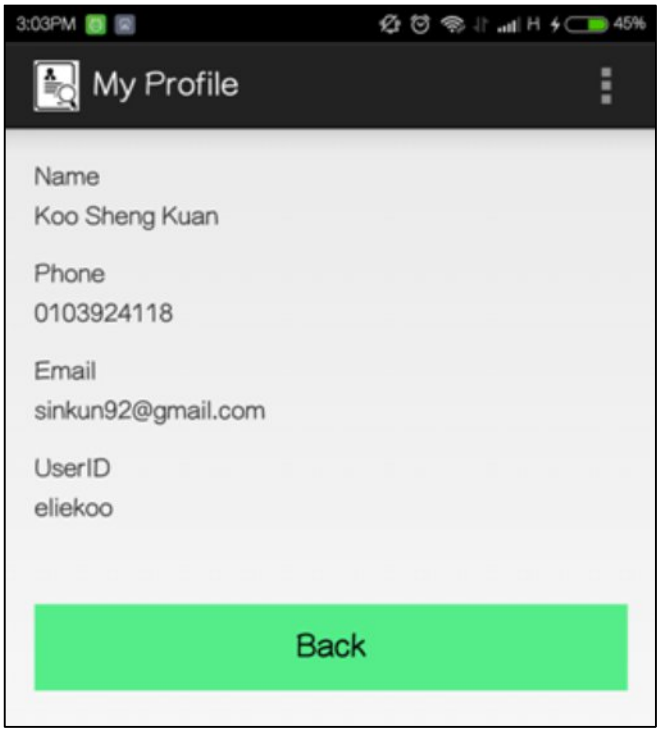

Figure 5.3.10 shows user can view his or her profile.

They can also click on menu of employee main page to select the functions and view it.

Figures 5.3.8.1 and 5.3.8.2 show user had selected “My Profile”.

(v) Employee Part - Create and Edit Resume

The resume parts consist of Contact Information, Academic Details, Work Experience, Interest & Skill, Project, Reference, and Other.

1. Contact Information

Figure 5.3.11 shows Contact Information Interface.

Figure above shows first interface of resume which is Contact Information. User can upload photo by select from gallery or take camera.

2. Academic details

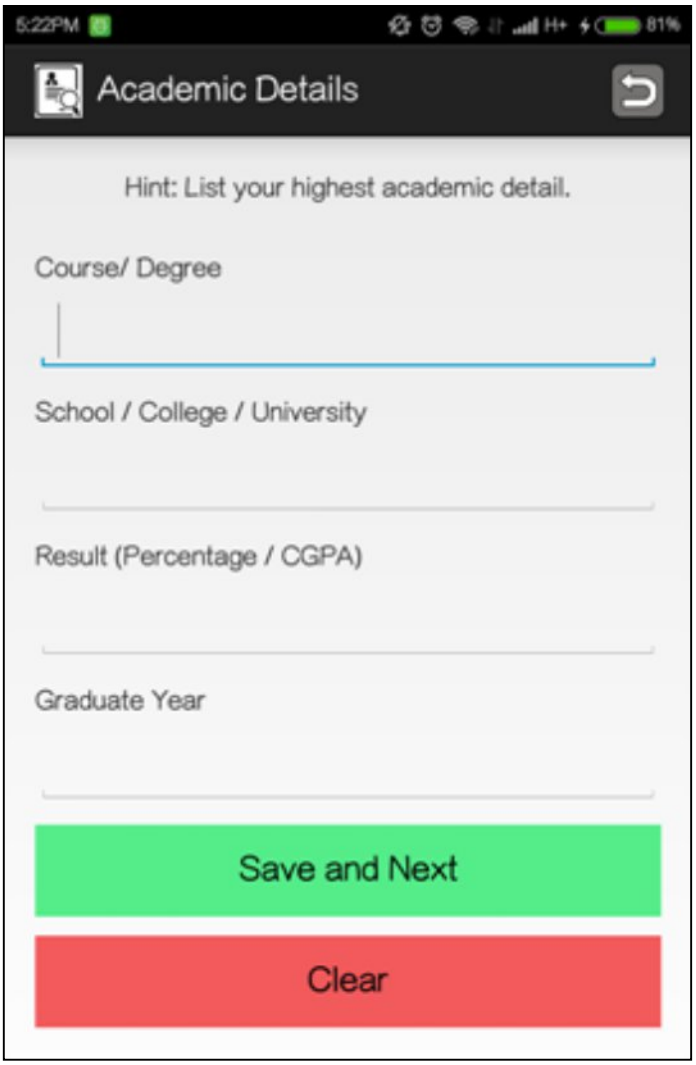

Figure 5.3.12 shows Academic Details Interface.

Figure above shows the second interface of resume which is Academic Details. User can key in their academic details here.

3. Work Experience

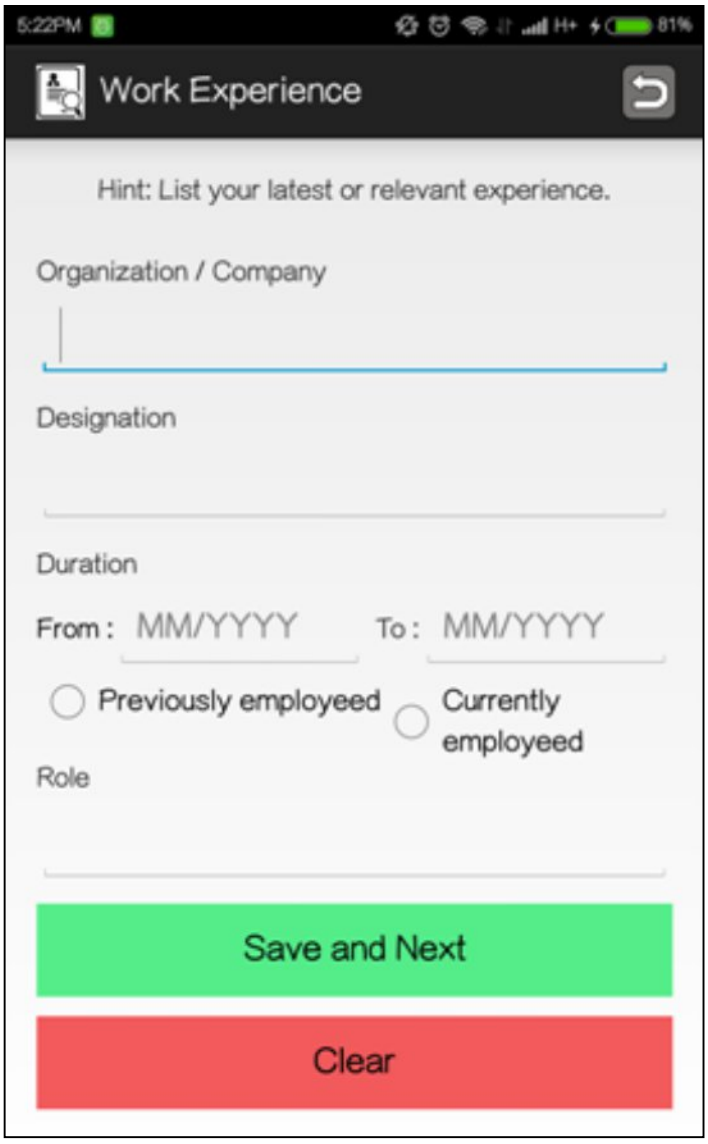

Figure 5.3.13 shows Work Experience.

Figure above is the interface of work experience, which is the next interface of Academic details. Users can enter their related working experience here.

4. Interest & Skill

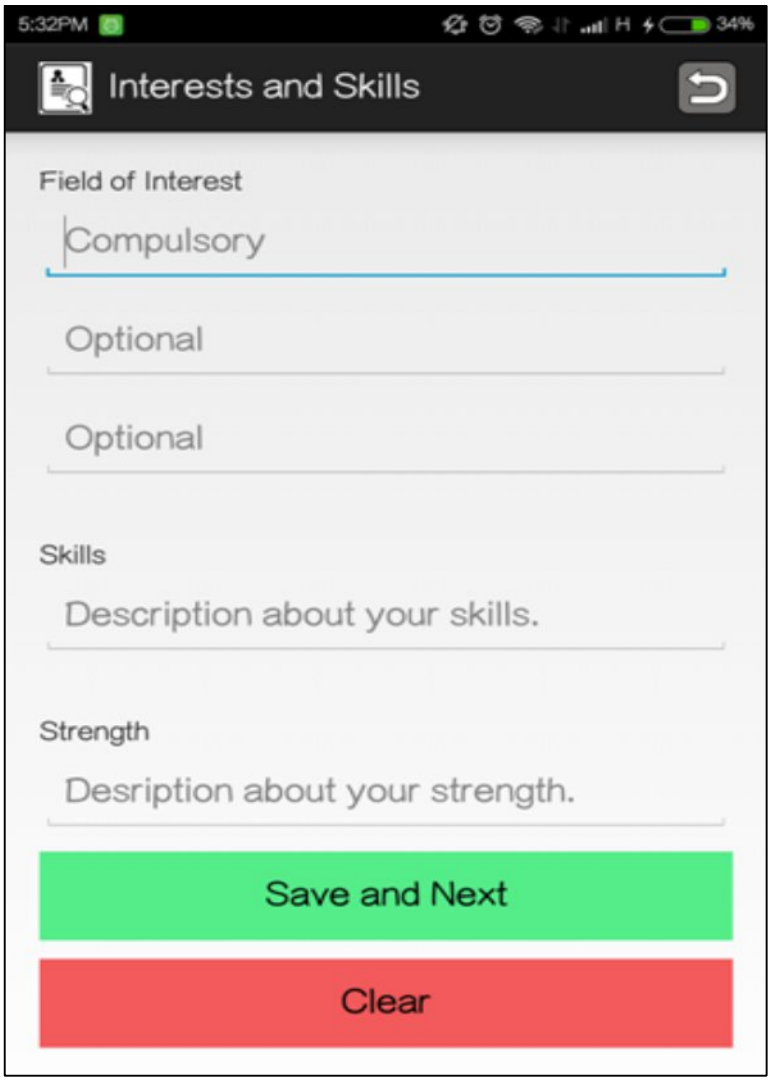

Figure 5.3.14 shows Interest and Skills Interface.

Next, is the interface of Interest and Skills. Users can input their resume details such as field of interest, skills and strength in this interface.

5. Project

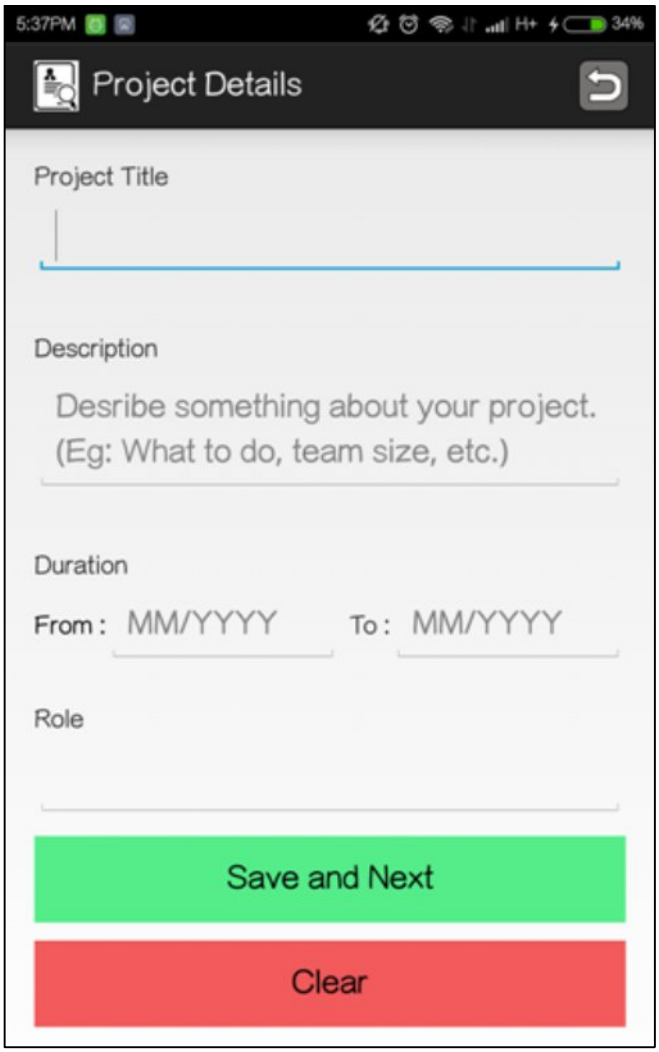

Figure 5.3.15 shows Project details interface.

In this project details interface, user can enter their relevant project details with some description.

6. Reference

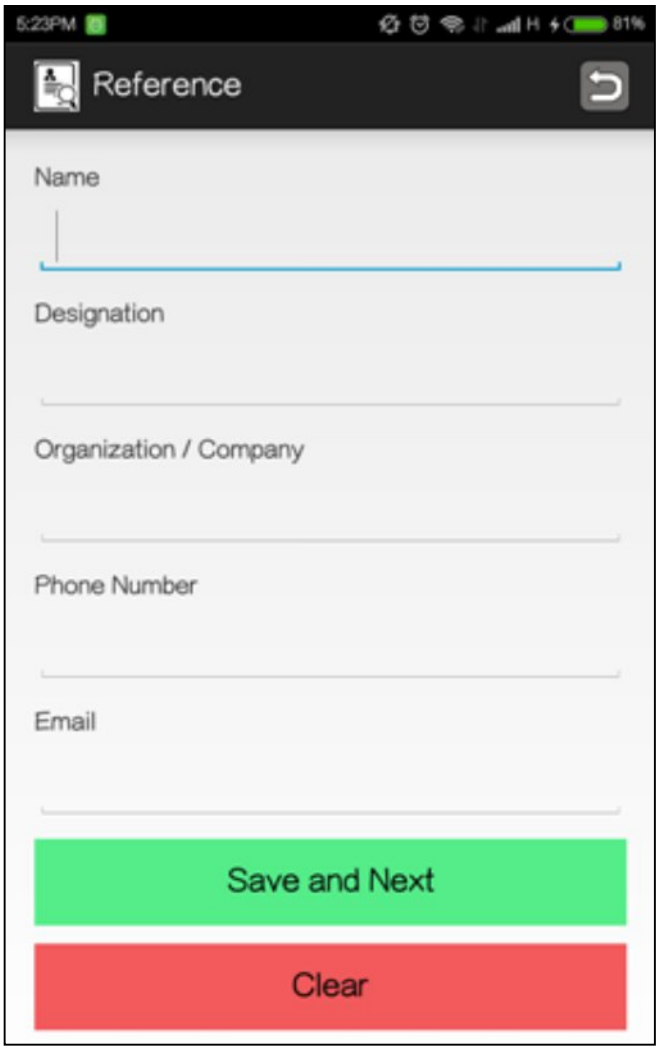

Figure 5.3.16 shows Reference Interface.

Figure above shows that user can input the details of their reference here.

7. Other

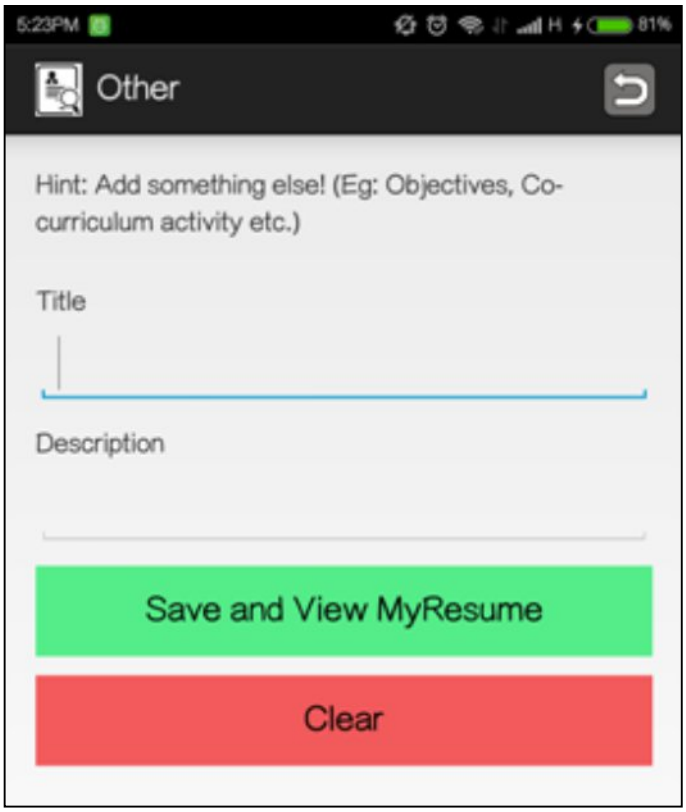

Figure 5.3.17 shows Other Details (One of the Resume Parts).

Figure above is the last part of resume which is Other Details Interface. User can enter any relevant details here such as objectives, curriculum activity, language and so on.

(vi) Employee Part - View, Create and Share Resume

After entered all the information of resume, users can view it by click on “View’ Share” at employee main page or “View MyResume” at menu of employee main page. After confirmation of the resume details are correct, user can select “Create myResume” at the bottom there.

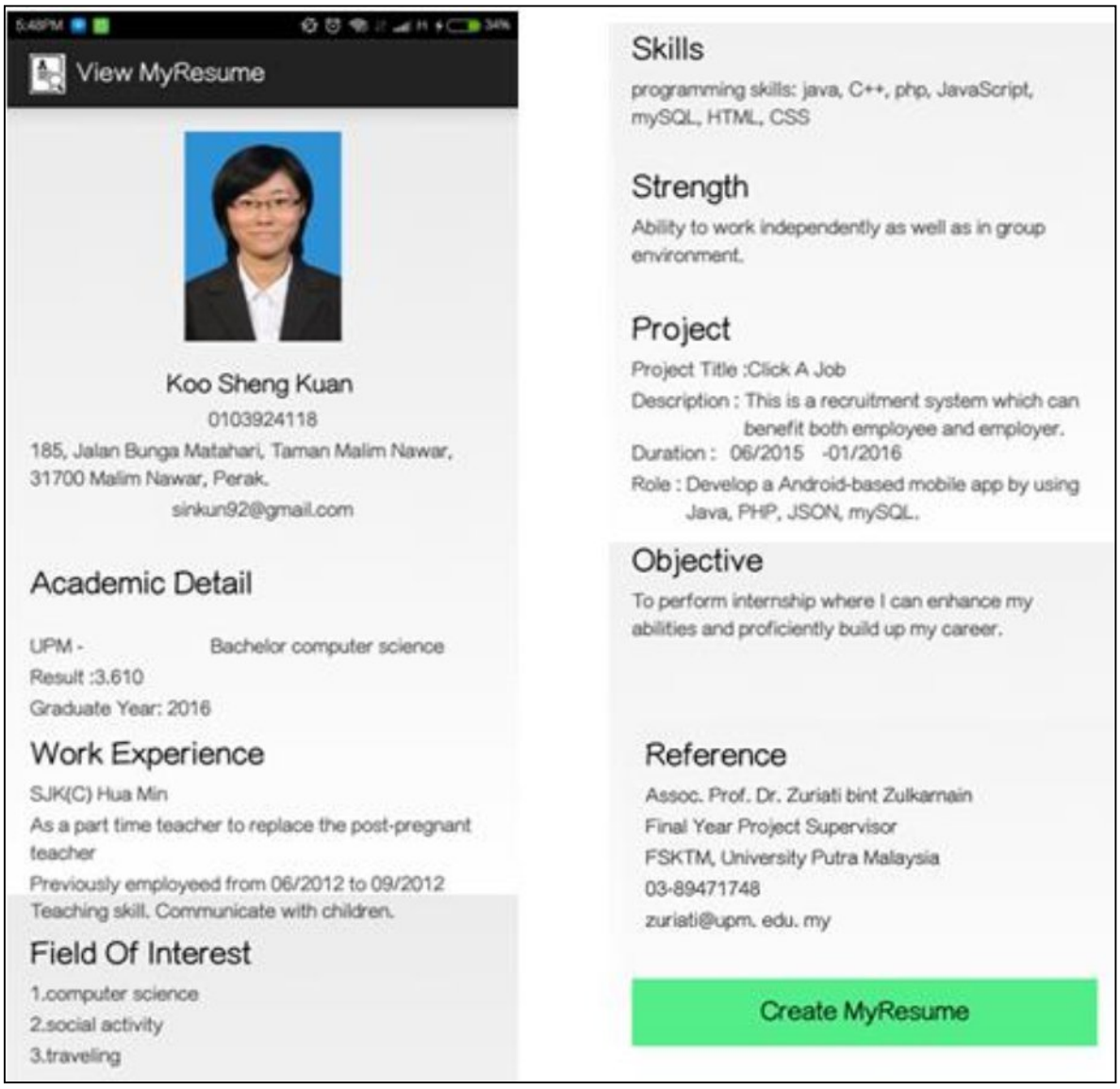

Figure 5.3.18 shows viewing an example of resume.

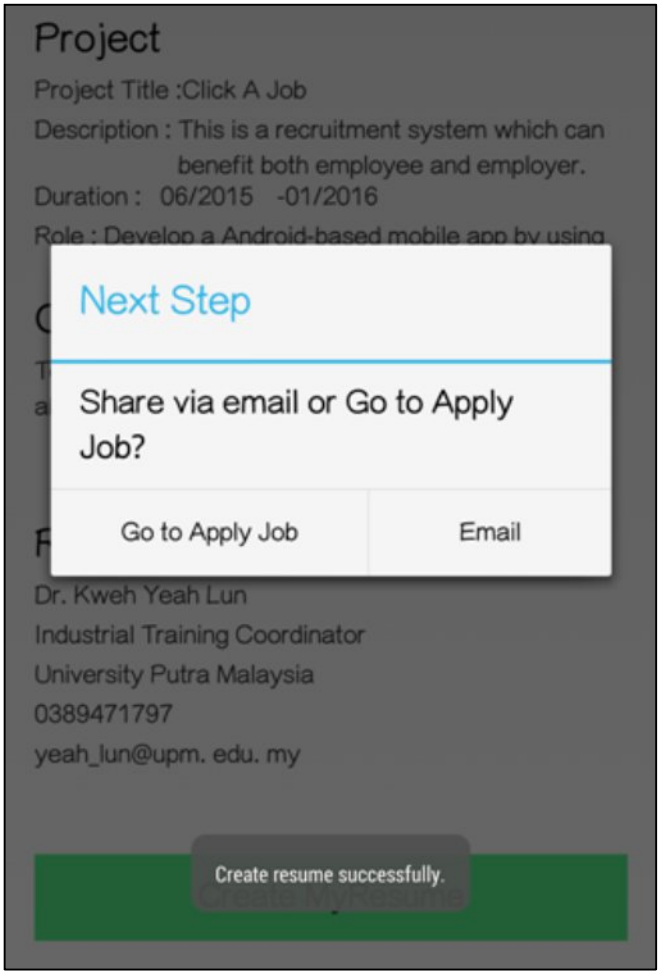

Figure 5.3.19 shows resume had been created and asking for next step.

After the resume is created successfully, the next step is application will ask user to select share their resume via email or go to apply job. If users choose to share via email, it will ask user to enter some details such as email address that they want send to, subject, and description.

Figure 5.3.20 shows the interface of share resume via email.

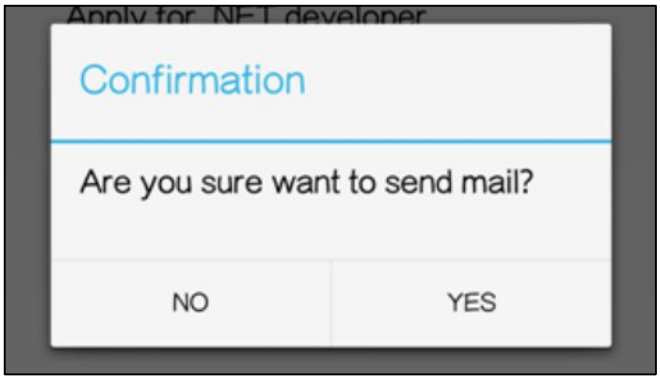

Figure 5.3.21 shows application asking users to make confirmation of send mail.

(vii) Employee Part – Apply for Job

Figure 5.3.22 shows the ListView of vacancies.

When users select “Apply Job” at the main page of employee or select “Go to Apply Job” at previous create resume page, the list view of vacancies will appear. Users can click and view each of them.

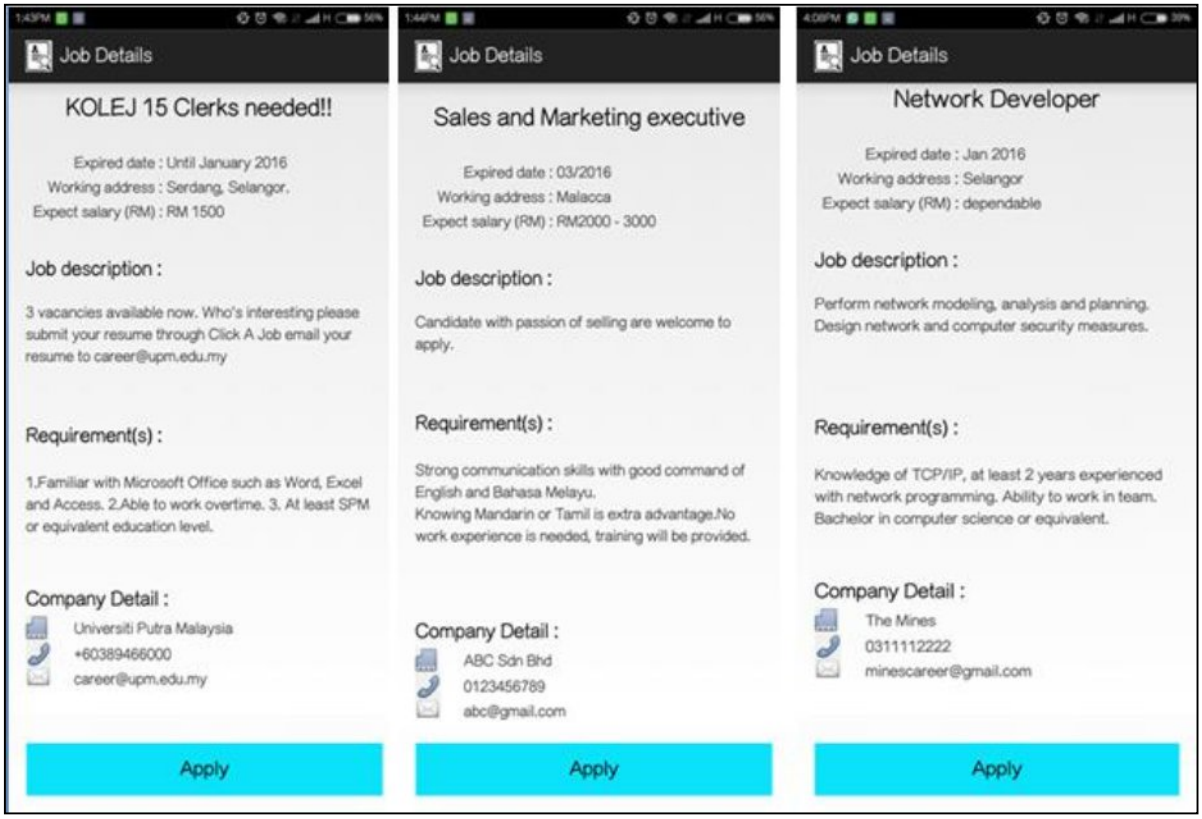

Figure 5.3.23 shows some examples of vacancies.

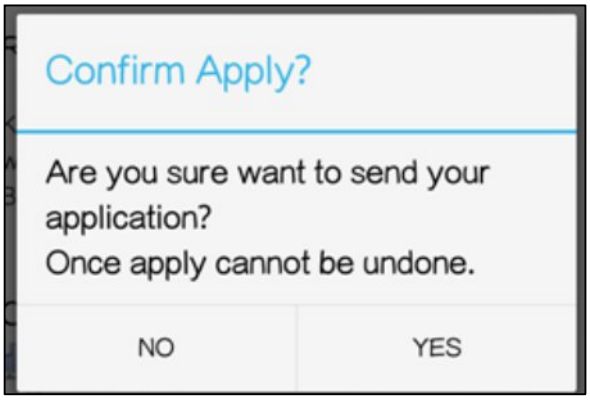

Figure 5.3.24 shows confirmation of send application.

After view the vacancy, if users feel interesting, they can click on “Apply” to send application. They can send multiple applications to different vacancies.

(viii) Employee Part – Logout

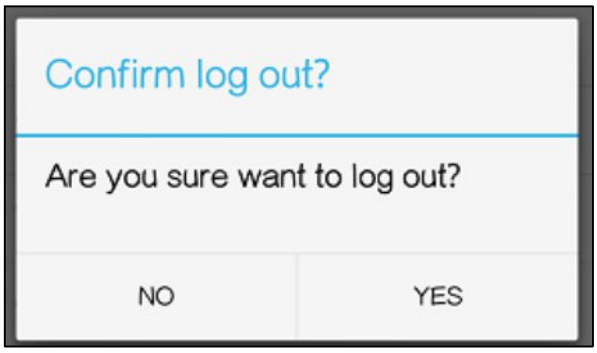

Figure 5.3.25 show logout function for employee.

If users want to exit this application, they can select “Logout” to logging them out. All the previous data will be cleared.

5.3.5 Employer Part

(i) Employer Part - Login As Employer

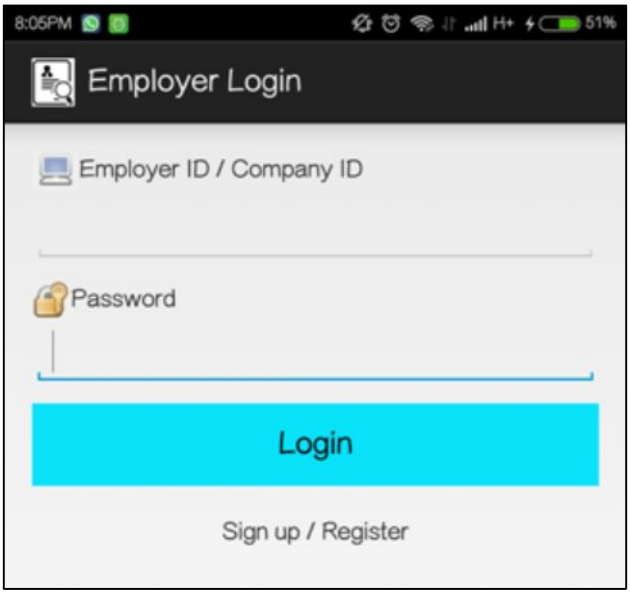

Figure 5.3.26 shows employer login interface.

They can login by enter their correct Employer ID/ Company ID and Password then click the blue “Login” button. If they had not been registered yet, they might click on “Sign Up/ Register” to register.

(ii) Employer Part - Register

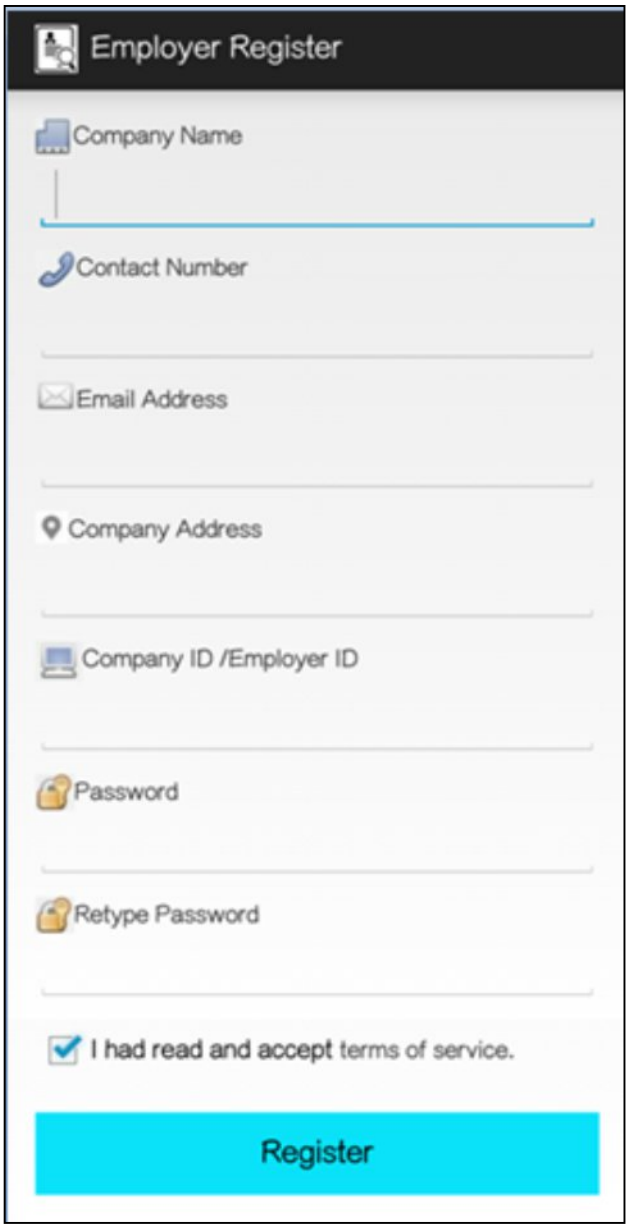

Figure 5.3.27 shows the register interface of employer.

If employer selects to register a new account, they need to enter the following information details such as Company name, contact number, email address, company address, Company ID or Employer ID, and Password.

(iii) Employer Part – Main Page

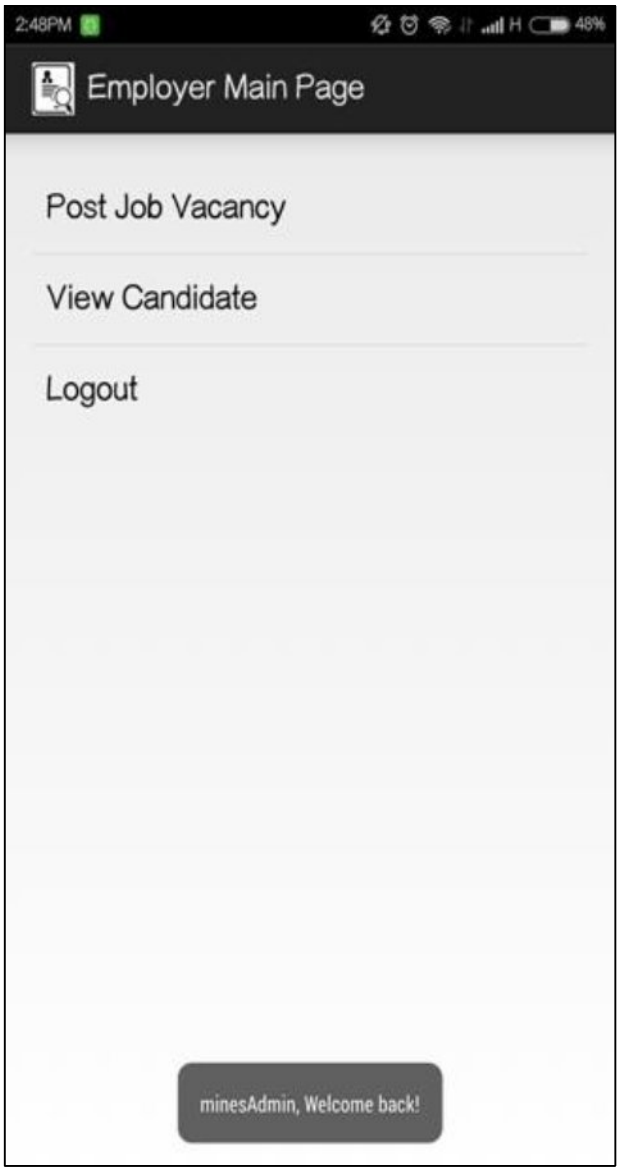

Figure 5.3.28 shows the main page of employer.

Figure above shows the main page interface of employer. If login success, application will shows “Welcome back” to employer. After login, users can select function such as post job vacancy which is creating a vacancy and post it. After that, they can view candidate’s information which is their resume details if there are some candidates applied for their vacancy.

(iv) Employer Part – Post Vacancy

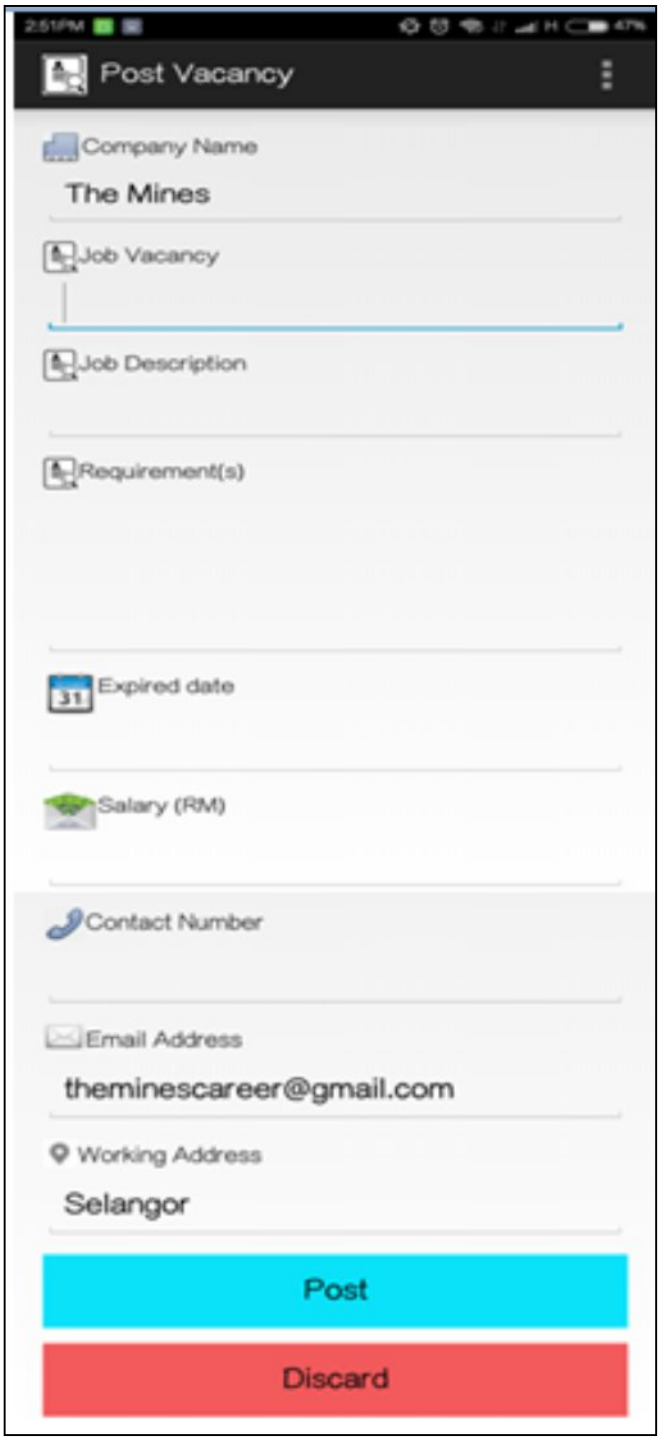

Figure 5.3.29 shows post vacancy interface of employer.

Employer need to complete the form as shown as figure 5.3.15 then only can post their vacancy.

(v) Employer Part – View Candidates

After posted the vacancy, users can select “View candidates” to view the candidates which had sent application to their vacancy.

Figure 5.3.30 shows the list of candidates.

The list above is their candidates; users can select each of them and view their resume details.

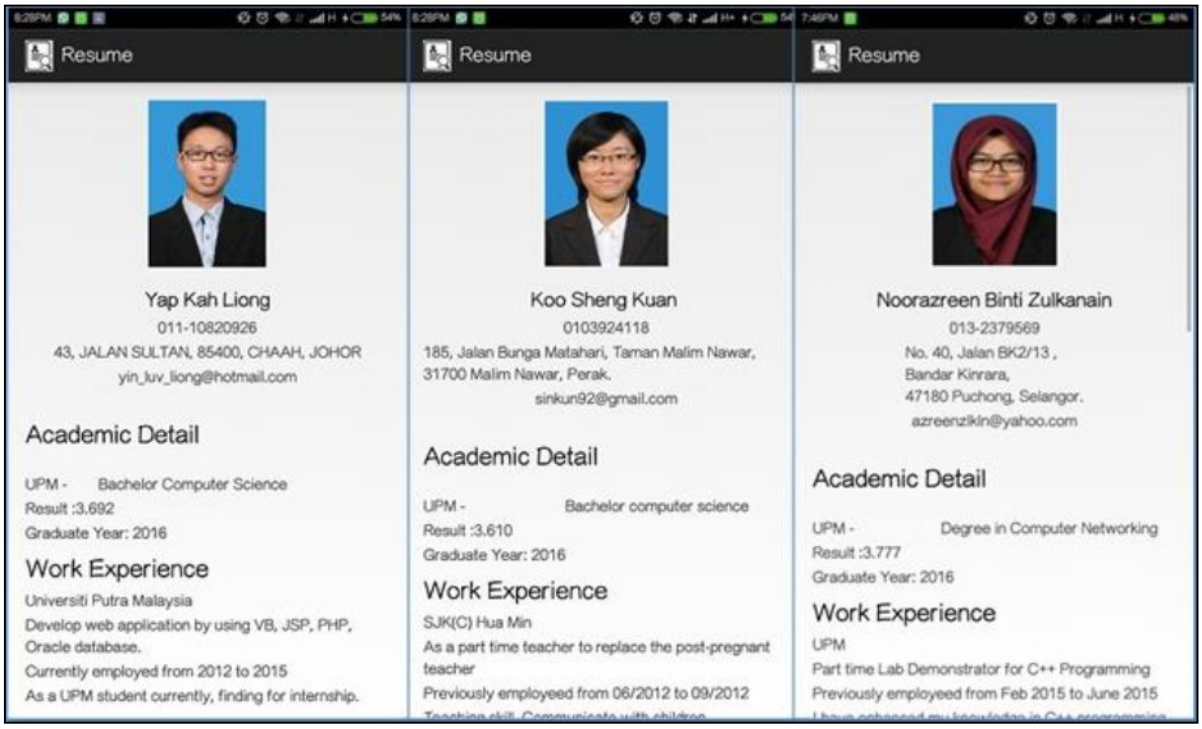

Figure 5.3.31 shows the examples of resumes of candidates respectively.

(vi) Employer Part - Logout

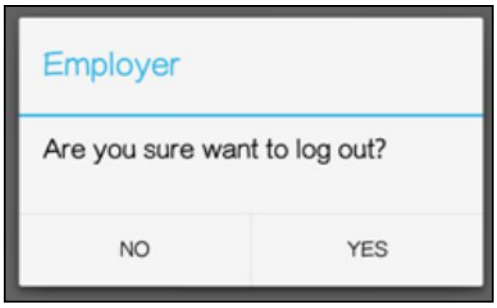

Figure 5.3.32 show logout function for employee.

If users want to exit this application, they can select “Logout” to logging them out. All the previous data will be cleared.

5.4 Testing

Testing phase is very important for developing software [46]. There are some important phases that had been test conducted to solve errors for sustain the reliability and ensure the security of Click A Job mobile application. For example, registration and login phases are very important to ensure only authorized users can access this application.

Test title	Employee or Employer Registration
Testing phase	Unit testing
Description	To ensure all users whether employee or employer have an account to login and only registered users can access into the system
Test procedure and data	**Case A** Test data 1: Name = Koo Sheng Kuan Phone = 010-3924118 Email = sinkun92@gmail.com UserID = eliekoo, Password = 123456 Retype Password = 123456 Tick “I had read and accept the terms of service.” 1. The form had been completed with valid information. 2. Sign up success. **Case B** Test data 2: Name = Koo Sheng Kuan

	Phone = 010-3924118 Email = (empty) UserID = eliekoo, Password = 123456 Retype Password = 123456 Tick “I had read and accept the terms of service.” 1. The form had not been completed, for example, email form is empty. 2. Sign up unsuccessful. 3. Application asks to complete the form. **Case C** Test data 3: Name = Koo Sheng Kuan Phone = 010-3924118 Email = sinkun92@gmail.com UserID = eliekoo, Password = 123456 Retype Password = 123456789 Tick “I had read and accept the terms of service.” 1. The form had been completed, but the passwords are different. 2. Sign up unsuccessful. 3. Application asks to check passwords.

	Case D Test data 4: Name = Koo Sheng Kuan Phone = 010-3924118 Email = sinkun92@gmail.com UserID = eliekoo, Password = 123456 Retype Password = 123456 Untick “I had read and accept the terms of service.” 1. The form had been completed, but users untick “I had read and accept the terms of service.” 2. Sign up unsuccessful. 3. Application asks to do agreement to our terms of service.
Expected results	Upon successful registration, users will be directed to Click A Job login page of employee or employer accordingly. For the sign up unsuccessful case, error message will be pop-up and ask users to check their details.

Table 5.1 Test description for users (both employee and employer) registration

Table 5.1 above shows an example of test description for user’s registration that describe the test case and expected results are recorded and documented.

Test title	Employee login
Testing phase	Unit testing
Description	To ensure only registered employee can access into the system
Test procedure and data	**Case A** Test data 1: UserID = eliekoo, Password = 123456 1. Enter the correct UserID and Password. 2. Login success. **Case B** Test data 2: UserID = Tommy, Password = 111111 1. Enter the incorrect UserID and Password. 2. Login fail.
Expected results	Upon successful login, employee will be directed to Click A Job the main page of employee or else error message pop-up and ask employee to check their details.

Table 5.2 Test description for employee login

Table 5.2 above shows a test description for employee login that describe the test case and expected results are recorded and documented.

Test title	Employer login
Testing phase	Unit testing
Description	To ensure only authorized employer can access into the system
Test procedure and data	**Case A** Test data 1: CompanyID = minesAdmin, Password = minesAdmin 1. Enter the correct CompanyID and Password. 2. Login success. **Case B** Test data 2: CompanyID / EmployerID = Tommy, Password = 111111 1. Enter the incorrect EmployerID and Password. 2. Login fail.
Expected results	Upon successful login, employer will be directed to Click A Job the main page of employer or else error message pop-up and ask employer to check their EmployerID and Password.

Table 5.3 Test description for employer login

Table 5.3 above shows a test description for employer login that describe the test case and expected results are recorded and documented.

Test case title	Expected results	Output
Employee registration	Employee registered successfully with all valid information. The data had been inserted into database.	Valid
Employee login	Employee able to login with correct UserID and Password. System will do comparison with the data in database.	Valid
Employee edit resume	Employee able to edit their resume details. The details of resume are retrieved from database and after edit will be inserted into database.	Valid
Employee view resume	Employee able to view their resume to check and make confirmation their details are correct. The details are retrieved from database and displayed on Click A Page View Resume Page.	Valid
Employee create resume	Employee is allowed to create resume after they confirm the details of resume. After that, details of resume will be inserted into database.	Valid
Employee share resume via email	Employee able to appeal their resume to third party via email after resume is created.	Valid
Employee apply jobs	Employee able to view the list of job vacancies and apply for multiple interesting vacancies. Details of vacancies had been retrieved from database.	Valid
Employee logout	Employer able to logout with all previous activities is cleared.	Valid

Employer register	Employer registered successfully with all valid information. The data had been inserted into database.	Valid
Employer login	Employer successfully login to the system with valid Employer ID/ Company ID and password. System will do comparison with the data in database.	Valid
Employer post job vacancy	Employer able to post job vacancy from their company by enters complete information. The details will be stored into database.	Valid
Employer view candidates	Employer able to view the list of candidates those had applied to their vacancy and choose to view their resume. Details of the resume is retrieved from database and displayed.	Valid
Employer Logout	Employer able to logout with all previous activities is cleared.	Valid

Table 5.4 Output after undergoing testing phase

Table 5.4 shows the outputs after undergoing testing phases. Test results and analysis are important to ensure that the system is functioning in a proper way it should be. If there are any errors occur during testing, the problems can be debugged and fixed as soon as possible. Therefore, testing will be done several times to ensure that the system's requirements are achieved. If there is no error occurs and all user requirements were met, it indicates that the system can be delivered to user. Besides, testing does help to improve the system's performance and stability.

5.5 Summary

In this chapter, implementation phase was briefly discussed and reviewed. The connection to server and database is important and has to be established before testing can be carried out. For the testing part, the system is tested with valid or invalid data to ensure the application functions well.

CHAPTER 6

CONCLUSION AND FUTURE WORK

6.1 Introduction

In this chapter, conclusion of the Click A Job are discussed in details. Some limitations, solutions and the future work of Click A Job will be discussed too.

6.2 Conclusion

Employment and income are lifestyle with value, choice and empowerment [47]. It is important because human tends to change for a better lifestyle. In this technology era, is a trend to search vacancy thru mobile devices and apply for job at fingertips. Thus, “A simple click can change your future” is our slogan to encourage users to use this application for the purpose changed for a better lifestyle.

Click A Job is specific designed to be used on mobile. It is an Android based mobile application. Problem statements and objectives stated in first chapter proposed the reason to develop such an application. It is targeted to public. Users can be categorized as employee which is job seeker or employer which is company that offer vacancies. Click A Job have open opportunities for job seekers. This mobile application enables employee to create their resume and appeal to interested company. It provides a solution for them to create resume and open to opportunities for their futures. At the same time, employer could post vacancy and employ easily.

As a result, Click A Job is a system that developed to improve the effectiveness of recruitment system. Employment can be making easily so that there are no more wasting time on searching jobs by employee themselves.

6.3 Future Work

This application is still in early stage. There are many enhancements can be done in the future. However, there are some limitations of Click A Job for this version. First, Click A Job not offer many formats of resume. Recently only one standard format of resume is available for employee. Second, resume or vacancy information cannot be downloaded or printed. Third, both users which are employee and employer can view each other's resume or vacancy, yet they can't communicate.

Therefore, some solutions can be made to improve those limitations. The first solution is adding more resume formats so that employee can select the best resume that suit to them. Next, feature that enable users to download and print the information of resume or vacancy will be added as they can connect to website for download or print it. Last but not least, feature that enables both employee and employer to communicate will be added. For instances, this application can connect both employee and employer to social application such as Email, Facebook messenger, Wechat, WhatsApp and so on.

Another future works need to be enhanced to protect Click A Job's users. For instance, security level of this application will be improved. There are encryptions of the details of resume of employee. Since their information is very important, it will be bad if been hacked and their information been abused by those trespasser.

Some enhancements can be done to the application so it can be more functional such as

enable user to communicate with each other. For example, by clicking the phone number, they can be directed to call to this phone number. Same to by clicking the email address, they can send mail to this email address.

6.4 Summary of Chapter 6

This chapter Conclusion and Future Works is discussed briefly on functions of the system and enhancement that can be carried out in the coming days. Overall, Click A Job overcome limitations of traditional ways of recruitment and employment. The trend of modern technology era, employing someone and get employ can be done at fingertips. This system is systematic and effective for introducing new technology which is why a lot of mobile application was created. This project had achieved its target to make employment easy and effective.

The conclusion explains the current problem facing by target users and how Click A Job helps to improve efficiency of employment. However, the suggested future works are strongly believed that it will make the system works even better.

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APPENDIX

APPENDIX A

FINAL YEAR PROJECT POSTER OF CLICK A JOB

APPENDIX B

PROJECT SCHEDULE AND GANTT CHART

Task Name	Duration (Days)	Start	Finish
Identify the problem	3	4th Sep 2015	6th Sep 2015
Proposal preparation	7	7th Sep 2015	13th Sep 2015
Reviewing proposal with supervisor	7	14th Sep 2015	20th Sep 2015
Development of Click A Job	77	21st Sep 2015	6th Dec 2015
- **Design coding**	28	21st Sep 2015	17th Oct 2015
- **Debug and testing coding**	14	12th Oct 2015	25th Oct 2015
- **Set up database**	14	26th Oct 2015	8th Nov 2015
- **Design and implementation user interface**	21	9th Nov 2015	29th Nov 2015
- **Testing the application**	7	30th Nov 2015	6th Dec 2015
Demonstration to supervisor	1	20th Dec 2015	
Thesis preparation	70	12th Oct 2015	28th Dec 2015
Poster preparation	7	1st Dec 2015	6th Dec 2015
Project presentation	1	29th Dec 2015	
Thesis submission	1	7th Jan 2016	

Figure B-1 Project Schedule for Development of Click A Job

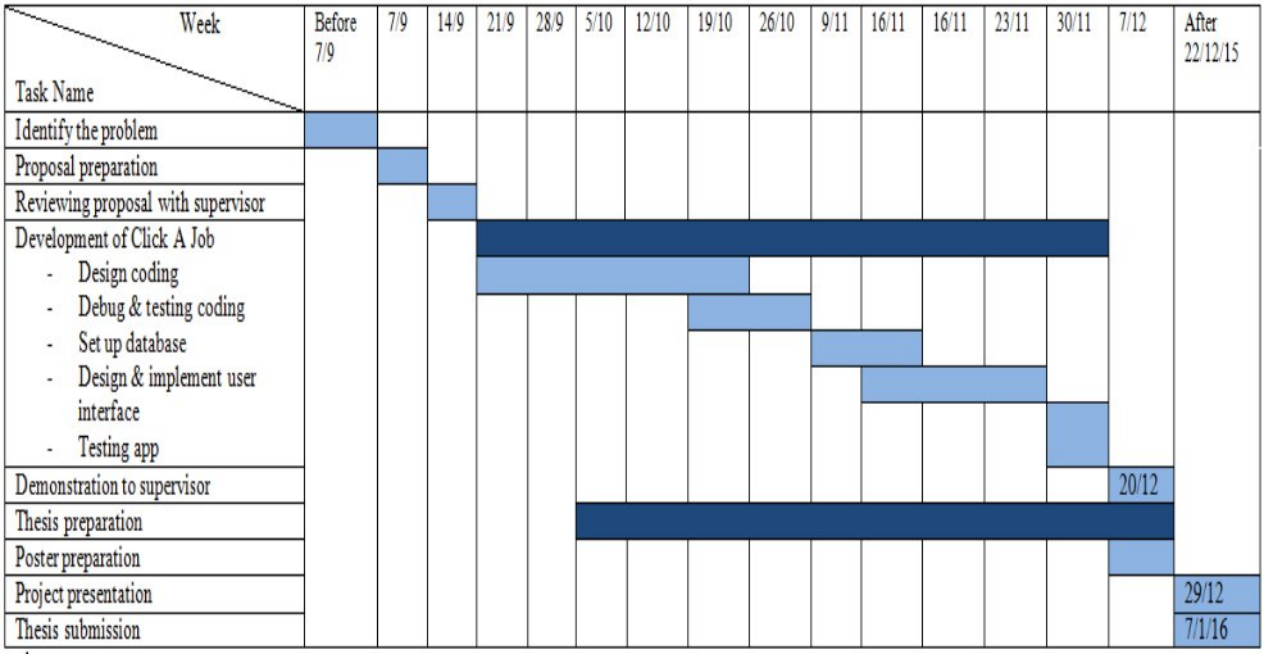

Figure B-2 Gantt chart for Development of Click A Job