

# **SMART Recruiters' Helper**

by

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Dissertation submitted in partial fulfillment of  
the requirement for the  
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CERTIFICATION OF APPROVAL  
SMART Recruiters' Helper

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In partial fulfilment of the requirements for the  
BACHELOR OF TECHNOLOGY (Hons)  
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May 2015

## CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

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WONG HANG PING

## **ABSTRACT**

In today's world, recruiting the right employees becomes one of the most important success factors for almost all the businesses. However, most of the employers stated that inaccurate judgments about the candidates during the interview session has brought a huge negative impact to the companies. Hence, a system named SMART Recruiters' Helper that helps to analyze the candidates' personalities based on their handwriting has been developed. To explain in more details, the system allows the recruiters to answer the evaluation questions in the system and the system will analyze the candidates' personalities based on these answers. This project will then be started with the objectives of identifying the criteria used to select the right employee for the company, developing a system that improves the accuracy in choosing the right employee based on the Psychology studies and lastly, conducting the usability testing with Human Resource Professionals in order to ensure the success implementation of the system. Besides, the proposed system is mainly designed for the managers and the senior executive in Human Resource Department who involve in the recruitment of the lecturers. SMART Recruiters' Helper system can also be used for all the computers that have already installed the Microsoft Office Professional Suite of business products. Next, the research methodology used in this project is interview and survey to collect the users' requirements and the main tool to develop the system will be Microsoft Access 2007. An observation has also been conducted to 7 people in Human Resource department. The finding shows that the system is believed to be able to improve the accuracy of the hiring decision. This whole paper is comprised of the introduction part, the related technologies and studies, the methodology used in completing the project as well as the findings from the survey and interview session.

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# **CHAPTER 1**

## **INTRODUCTION**

### **1. 1 BACKGROUND OF STUDY**

Today, recruiting the right employees becomes one of the most important factors to be succeeded in almost all the businesses. The reason is that recruiting the right employees is believed to be able to enhance the customer satisfaction and to build a good reputation. Not only this, right employees can also improve the efficiencies in work. Therefore, it is true to say that recruitment process is of paramount importance in determining the success of a company.

However, alarming indeed, West (2013) revealed that there is around 66% of the employers stated that they have experienced negative impacts of making the wrong hiring decision in the year of 2012. To further discuss about the real cost of hiring a bad employee, Gorey (2012) stated that the average cost of making a wrong hiring decision is around 30% of one's potential earnings in the first year. This means a single bad hiring decision with an annual income of \$60,000 can cost company around \$20,000 loss. Moreover, it also takes a huge amount of money to replace a wrong hire with high salary.

This research project is therefore, focusing on developing a system that help the interviewer to analyze the candidates personalities based on his or her handwriting styles. By doing this, we hypothesize that this system will be able to improve the accuracy in choosing the right employees based on the Psychology studies. To explain further, the questions need to be answered by the interviewers based on their interaction with the candidates. These questions can include ' Which of the following below best describe the candidate's handwriting slant?' to analyze their emotional stability.

From here, it is clear that this research project aims at increasing the accuracy in interviewing by giving the guidelines or suggestions to the interviewers.

Besides, it is also true to say that most of the companies in today world rely on their Human Resource Professionals in recruitment. However, it is an undeniable fact that human factors such as human mood, fatigue, bias, or personal assumptions will affect the accuracy of the hiring decision. Not only this, Ping (2015) reported that there is around 3 out of 10 of Rimbunan Hijau Group of Companies' employees are actually bad hires. Therefore, this project with a new concept is believed to be able to assist the interviewers in order to make a more accurate decision.

The rest of this chapter will be organized as follows: the next section will put forward the problem statement of this project. This will be followed with the objectives section and lastly, scope of the study.

## **1.2 PROBLEM STATEMENT**

Today, recruitment has become one of the most important aspects for an organization to select the right employee for right job. However, more and more companies reported that the wrong hiring decision has brought a great negative impact to their companies. One of the biggest problems in recruitment includes the inaccurate judgments about the candidates.

As interviewing is always considered as an easy task, most of the company neglect the importance of giving a proper training for the interviewers (Gumbinner, 2014). This can lead to bad interviewing and hiring results when the interviewers do not know how to hire the correct people and they start to use their own assumptions to select people. Besides, as there is no exact standard to evaluate the candidates' personalities or attitude, the results obtained from the evaluation of the candidates are always inconsistent.

Not only this, human factors such as interviewer fatigue or mood can also weaken the interviewers' judgment. It is also strongly believed that a bad mood can negatively affect one's subjective judgment and it causes different recruiters to have different perspectives on the same candidate (Forgas, 2000).

Furthermore, bias and prejudices in recruiting cause one to make a bad hiring decision. The interviewers often unfairly evaluate qualified candidates based on personal prejudices. One of the most common trends is that the managers tend to hire someone that they perceive to be like them or like someone they know and like. They make hiring decisions based on personal preferences and this may lead to bad hiring decisions in the company. In fact, although the personality test already exists in the market, it is still believed that the candidate can cheat on the answers to get the best result for the test. However, if one wants to fake his or her handwriting, he will still unconsciously repeat his or her natural characteristics of handwriting. Thus a system that helps to analyze the candidates based on his handwriting styles could remedy the situation.

### **1.3 OBJECTIVES**

- ✓ To identify the criteria used to select the right employee for the company.
- ✓ To develop a Human Resource system that improves the accuracy in choosing the right employee based on the graphology.
- ✓ To conduct the usability testing with Human Resource Professionals in order to ensure the success implementation of the system.

### **1.4 SCOPE OF STUDY**

The scope of this project is a recruitment system with the name of SMART Recruiters' Helper that allows the interviewers to answer the handwriting related questions and the system will help to analyze the candidates' personalities based on their answers.

Moreover, this system is mainly designed for the managers and the senior executive in Human Resource Department who involve in the recruitment process. This system is mainly for the recruitment of the lecturers.

Besides, as the main focus of the project is the accuracy of the analysis made based on the answers given by the recruiters, the project will come out with a system that provides the accurate and useful analysis information of the candidates' personalities.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

This chapter mainly discuss about the use of personality assessment in personnel recruitment in order to improve the hiring decision. There are two dominants themes of the research questions which include the hiring problem in today world, the research studies in personality as well as the use of current technologies in personality assessment as well. To discuss in more details, these studies explain about the theory of the human behavior prediction.

#### **2.2 HIRING PROBLEM IN TODAY'S WORLD**

Hiring wrong employees can have a very huge impact for almost all the businesses in this world. It means recruiting someone with negative attitude, unable to work with others and cannot produce a proper quality of work, with immediate attendance problem, fail to reach the company's expectations and someone who receive customers' complaints. Leonard (2013) has then defined it as hiring someone is not suitable for the job and is not able to perform well.

Hiring a wrong hire can cause the companies to incur a great losses. Brad Smart (2005) supported this statement by indicating that hiring a wrong employee can actually cost the company a very big amount of money in his book named "*How To Hire, Coach and Keep A Players*". To further investigate the true costs of a bad hire, the cost can also include hiring costs, total compensation costs, costs of maintaining employees, disruption costs, severance and also the mistakes, failures, and missed business opportunities.

According to a report from career builder (2013), there is 27 percent of United States employers indicated that a single wrong hire can cost more than \$50,000, half of the China employers reported cost of \$48,734, 27 percent of British employers stated that it costs them more than \$50,000 British pounds, 29 percent of Indian employers reported 2 million Indian rupees and 29 percent of Germany employers reported a single wrong hire cost \$65,231. Not only these, In fact, hiring a wrong employee can also affect the team performance and also blemish a company reputation.

Hiring wrong employees can be caused by various reasons. The reasons can include the recruiters who make hiring decision based on their own feelings and perceptions, great resume that give the wrong information to the recruiters, fatigue that causes the recruiters to make wrong decision, recruiters bias that affect the hiring process, and also the interviewees who cheat in the personality test. Rubin (n.d.) also stated that the distortions of the information can be one of the most important reasons of why the hiring managers today make bad hiring decisions. This is because the hiring managers recruit the person without realizing him or her actually give the inaccurate information on their resumes or application forms (Rubin, n.d.). Not only this, there are also many books in the market that actually teaches the candidates to distort information during the interview session by giving untrue answers to different interview questions. In this case, distortions of information increase the possibility of hiring wrong employees. Besides, University of Wisconsin-Madison (2008) conducted another study on hiring decisions and it stated that the employers always tend to evaluate the applicants based on their biased and stereotypical information about different races and genders.

In fact, stereotypes can affect the hiring decisions and it changes the interviewers' thoughts even when they are unaware of such effect. Fatigue can cause the recruiters to be more likely to stereotype (Devine et al. 2002). Moreover, University (2011) also indicated that most of the recruiters hire the people with good looks without further investigating the interviewees' personalities. The physical attractiveness bias in hiring occurs where the attractive people is considered as more capable, sociable and more successful than unattractive people (Dion, Berscheid & Walster, 1972).

From the studies by all these researchers, we can conclude that the inaccurate hiring decisions can be caused by various reasons that the company can hardly control.

### **2.3 USE OF PSYCHOLOGY IN EMPLOYMENT RECRUITMENT PROCESS**

The use of psychology helps to improve the accuracy of the hiring decision as it helps the recruiters to read the candidates' mind. However, the company oftentimes focuses on the testing the candidates' capability and they neglect the importance of having good attitudes in work. This can be the most common mistakes that almost all the companies in this world has made. In fact, psychology can prevent the recruiters from being bias as the analysis is based on an accurate and consistent psychological information. The information obtained from psychology profiling is highly objective, and thus it acn reduce the possibility of making different judgment for the same candidate (Byrne, 2003).

However, Bryne (2003) also stated that there are few important questions need to be answered before using any psychology tools to evaluate the candidates. First, is the test designed for the specific job position in the company? This is because different job positions require different personalities. Second, can this psychology tool helps to compare between a large numbers of the candidates? Next, is there any proof that this psychology tool improves the accuracy of the hiring decision? Lastly, is it possible that this psychology tool can detect if the candidates are trying to fake during the test?

If the psychology tools meet these requirements, it is undeniably important to be used as it helps the company to be succeeded by making more accurate hiring decision.



## **2.4 HUMAN BEHAVIOUR PREDICTION**

### **2.4.1 Handwriting Analysis**

The research on this handwriting analysis was first done by the historian Seutonius Tranquillus (Abdul Rahiman, 2013). According to his research, he said that the handwriting of several emperors indicate different personality traits (Abdul Rahiman, 2013). His research was then continued by Abott Jean-Hippolyte Michon and Abott Flandrin by collecting different handwriting samples and matching this handwriting with different personalities.

Hitherto, there are many researches that have been done to indicate the importance of the handwriting analysis in evaluating individual's personality. According to Abdul Rahiman (2013), handwriting analysis which can also be known as Graphology or brain writing can determine one's personality traits by studying neurological brain pattern. To explain more about this, a unique neuromuscular movement will be stimulated by human's neurological brain pattern when writing and each movement actually represents different personality trait (Abdul Rahiman, 2013).

Janet (2012) also support this research by saying that a unique individual's handwriting can reveal their personality regardless of their races. The research focuses on making the comparison between the handwriting of the criminals and the handwriting of the non-criminals to determine the possibility of one committing crimes.

One of the most important feature to determine an individual's personality traits is the pressure of writing (Abdul Rahiman, 2013). Emotional intensity of a writer can be shown by analyzing how much pressure the person exerts on the paper when writing. For example, light pen pressure indicates that the experience do not leave him or her a lasting impression and the person was not affected by the event and a heavy pen pressure indicates that the experience left the person with a very deep feelings and he or she will not forget the experience easily (Abdul Rahiman, 2013). Bosak (n.d.) also added that heavy pen pressure shows that the person can be very stubborn, healthy and forceful whereas a person with light pen pressure can be physically weak and sensitive.

Another similar research done by Cardenas (n.d.) shows that heavy pressure means the intense emotions, strong sensual needs, good health, strong vitality and realistic. Besides, Cardenas (n.d.) also stated there is also a handwriting of medium pressure and this indicates that he or she is perceptive, conservative and has a good memory (Cardenas, n.d.). FIGURE 2.1 shows the different pressure of writing. The picture in the left hand side indicates the light writer and the picture in the right hand side is heavy writer.

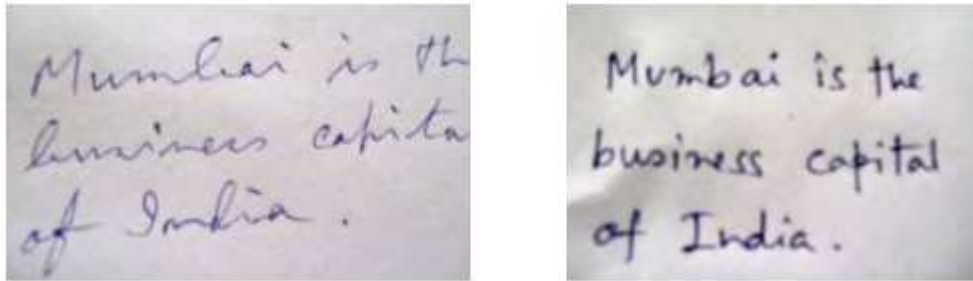


FIGURE 2.1 Different pressure of handwriting

FIGURE 2.2 is therefore showing the handwriting with medium pressure.



FIGURE 2.2 Handwriting with medium pressure

FIGURE 2.3 shows the light pressure from Cardenas (n.d.) research and he stated that this handwriting represents a gentle, cultural, sedentary person who prefers to avoid confrontation and prefers intellectual approach.

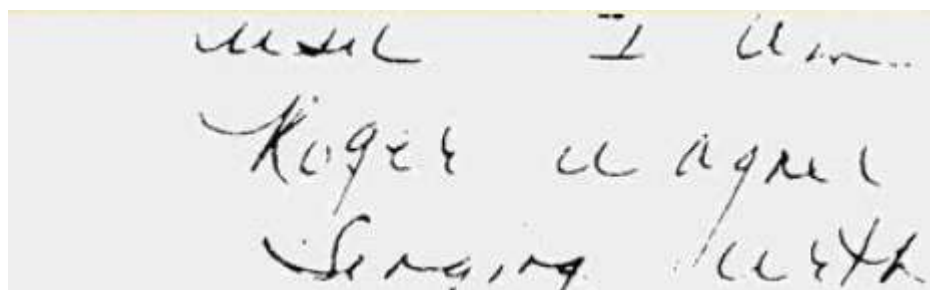


FIGURE 2.3 Light handwriting pressure

Moreover, another features which are the slant of letters and the slant of baseline can also be used to determine an individual's personality. To explain how the different baseline identify different personalities, a straight baseline indicates that the person is reliable, determined and he or she is able to motivate himself or herself and the person can also manage his or her emotion well (Abdul Rahiman, 2013). However, ascending baseline shows the personality traits which are positive attitude, upbeat, ambitious and helpful whereas descending baseline represents negative thinking, tired which are the opposite of ascending baseline (Abdul Rahiman, 2013). FIGURE 2.4 shows different slants of baseline and there are common baselines which are normally straight baseline, ascending baseline and descending baseline.

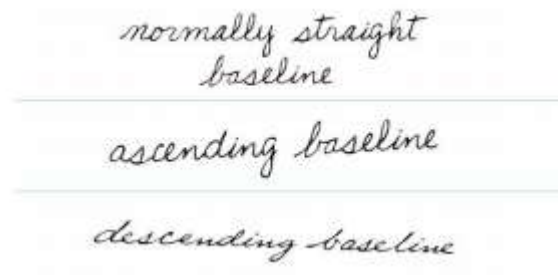


FIGURE 2.4 Different slants of baseline

Next, to identify the slant of letters, many data points will be used. Specifically, a trend line that passes closely among all the points which can also be known as regression lines, can be calculated using the formula below:

$$\Theta = \tan^{-1} \frac{y_2 - y_1}{x_2 - x_1} \dots\dots\dots (2.1)$$

The picture in the right hand side in FIGURE 2.5 shows the  $\Theta$  whereas the picture in the left hand side indicates the slant height when  $\Theta$  is compared with  $90^\circ$ . For the picture in the left hand side, the first line in the FIGURE 2.5 is considered as a right slant. The second line indicates as a left slant whereas the third line is a vertical slant.

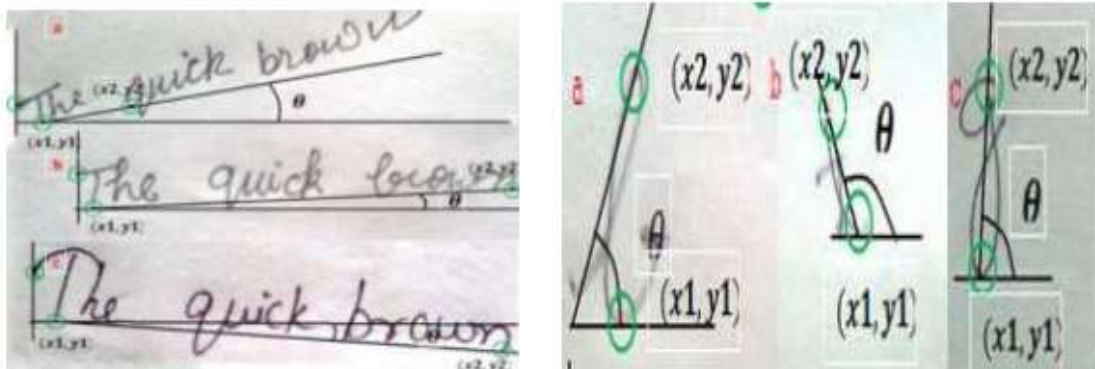


FIGURE 2.5 Slants of letters and trend Lines

In fact, according to Abdul Rahiman (2013), a person with the right-slanted handwriting is believed to be a sociable, responsive person who is open to others' ideas. He or she is also believed to have a high interest in others and is a friendly person. A person with vertical handwriting style is independent, disciplined, practical and self-sufficient. He or she do not concern about others' opinions. Left slant indicates that the person is observant, self-reliant, reserved, non-intrusive and shy.

Size of letters is also important. The standard size of letters is the one with the benchmark of 3mm and full height of 9mm. From the figure below FIGURE 2.6, there are three zones which are upper zone, middle zone and lower zone. Those handwritings with the size which is less than the normal size is small handwriting and those with larger size is large handwriting.

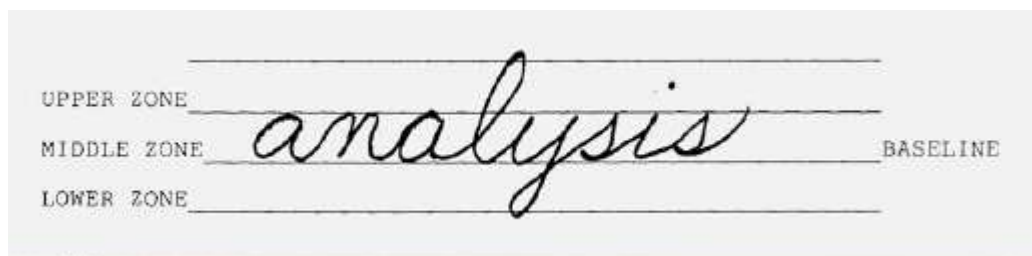


FIGURE 2.6 Standard size of letters

Larger handwriting in FIGURE 2.7 indicates that he or she is extrovert who has a high level of confidence (Cardenas, n.d.). Besides, it also indicates that the person is superior and arrogant and has a high demand for attention (Cardenas, n.d.).



FIGURE 2.7 Large handwriting

Small writing in FIGURE 2.8 represents the personality traits of respectful, shyness, having a deep thinking, high level of tolerance and also the high ability to concentrate (Cardenas, n.d.).

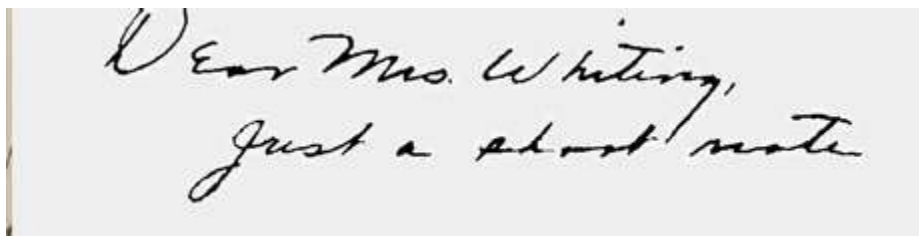


FIGURE 2.8 Small handwriting

Lastly, the amount of spacing between the letters and words predict how the human will react in close personal associations. When the lines are separated as shown in FIGURE 2.9, it indicates that the person is open-minded and is able to organize work.

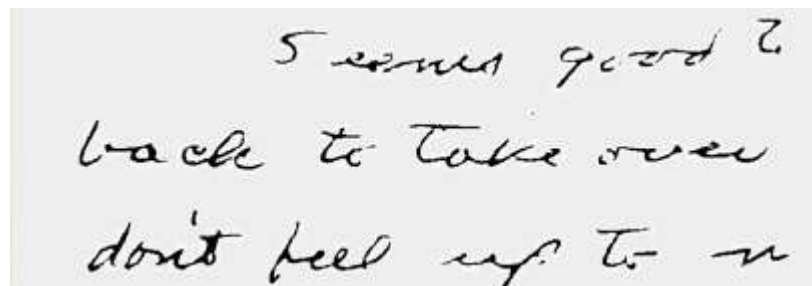


FIGURE 2.9 Handwriting with the lines separated

The person with all the words crowded together as shown in FIGURE 2.10, he or she may be unstable in emotions and has a poor organization of time and space.

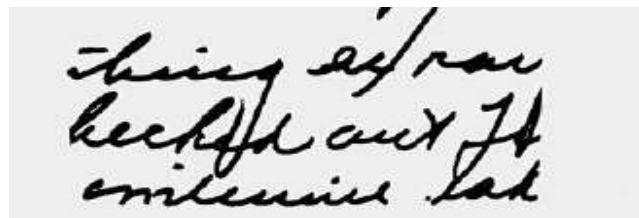


FIGURE 2.10 Narrow-spaced words, overlooping loops

## 2.5 DESIRABLE PERSONALITY TRAITS OF LECTURERS

According to (Rohani Salleh, 2013), most of the university students stated that the most desirable personality traits of a lecturer include being helpful, approachable, fair and impartial, inspiring, concern for students, enthusiasm for teaching, patient, friendly, caring and has a good sense of humor. TABLE 2.1 shows the rankings of these desirable personality traits.

TABLE 2.1 Desirable Personality Traits of lecturers

<b>Variables</b>	<b>Rank</b>	<b>Mean</b>
Helpful	1	4.70
Approachable	2	4.64
Fair and impartial	3	4.55
Inspiring	3	4.55
Concern for students	3	4.55
Enthusiasm for teaching	6	4.53
Patient	7	4.44
Friendly	8	4.42
Caring	9	4.32
Good sense of humor	10	4.29

### 2.5.1 Calculation of Suitability Percentage

To calculate the suitability percentage of a candidate who applies to be a lecturer, the result from the preceding chapter is used. First, look at the mean or average marks for each criteria. There are 111 respondents involved in the survey session. Therefore, to calculate the total marks that 111 respondents give to each criteria, the formula is:

$$\text{Average/Mean} = \frac{\text{Total marks}}{\text{Numbers of respondents}} \dots\dots\dots (2.2)$$

TABLE 2.2 Total marks for each criteria

<b>Variables</b>	<b>Rank</b>	<b>Mean</b>	<b>SD</b>	<b>Total marks</b>
Helpful	1	4.70	0.56	521.70
Approachable	2	4.64	0.52	515.04
Fair and impartial	3	4.55	0.61	505.05
Inspiring	3	4.55	0.63	505.05
Concern for students	3	4.55	0.61	505.05
Enthusiasm for teaching	6	4.53	0.71	502.83
Patient	7	4.44	0.64	492.84
Friendly	8	4.42	0.65	490.62
Caring	9	4.32	0.70	479.52
Good sense of humor	10	4.29	0.80	476.19

Total marks for all criteria	<b>4993.59</b>
------------------------------	----------------

After we have obtained the total marks of all criteria by summing up all the marks of each criteria, next we convert the total marks to 100% by using the formula:

$$\frac{\text{Total marks}}{?} = 100 \dots\dots\dots (2.3)$$

$$\frac{4993.59}{?} = 100$$

$$? = \frac{4993.59}{100}$$

$$? = 49.9359$$

After that, Change all the total marks for each criteria to be over 100% by dividing by 49.9359.

TABLE 2.3 Total marks for each criteria over 100%

<b>Variables</b>	<b>Mean</b>	<b>Total Marks</b>	<b>Total Marks over 100% (%)</b> <b>Divide Total Marks by 49.9359</b>
Helpful	4.70	521.70	10.44739356
Approachable	4.64	515.04	10.31402258
Fair and impartial	4.55	505.05	10.1139661



Inspiring	4.55	505.05	10.1139661
Concern for students	4.55	505.05	10.1139661
Enthusiasm for teaching	4.53	502.83	10.06950911
Patient	4.44	492.84	9.869452638
Friendly	4.42	490.62	9.824995644
Caring	4.32	479.52	9.602710675
Good sense of humor	4.29	476.19	9.536025184
Total			100%

Suitability is calculated based on the importance of the traits. If the system detects that he or she is helpful, he got 10.44739356. And the suitability will be added if he or she has other traits.

## 2.6 CURRENT TECHNOLOGIES IN PERSONALITY ASSESSMENT

### 2.6.1 HireVue

HireVue mobile recruiting application assists the recruitment process by enabling the interviewers to set their own interview questions (LADIMEJI, 2012).

FIGURE 2.11 shows the interface of the HireVue Mobile application in Google Play Store and the developer is a company named HireVue Company.

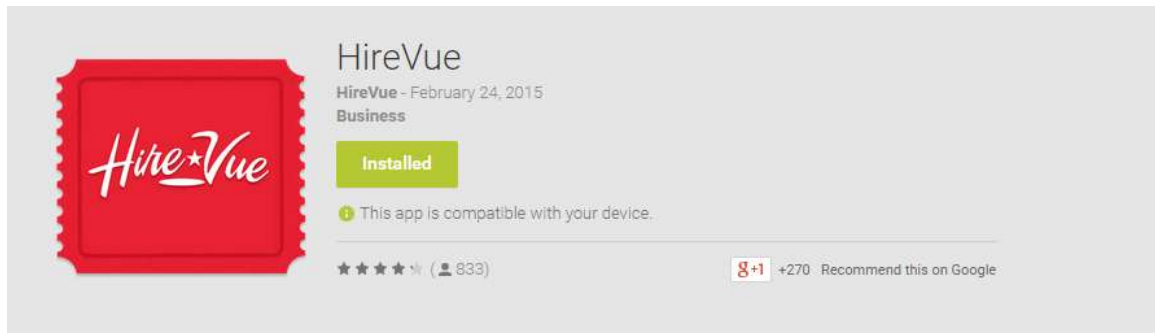


FIGURE 2.11 HireVue Mobile Application (HireVue, 2015).

Source:

<https://play.google.com/store/apps/details?id=com.hirevue.candidate.generic&hl=en>

After the interviewers finish designing all the interview questions, they can send the interview code to the candidates and the interview will start once the candidates enter the correct interview code that has been given, as shown in FIGURE 2.12.

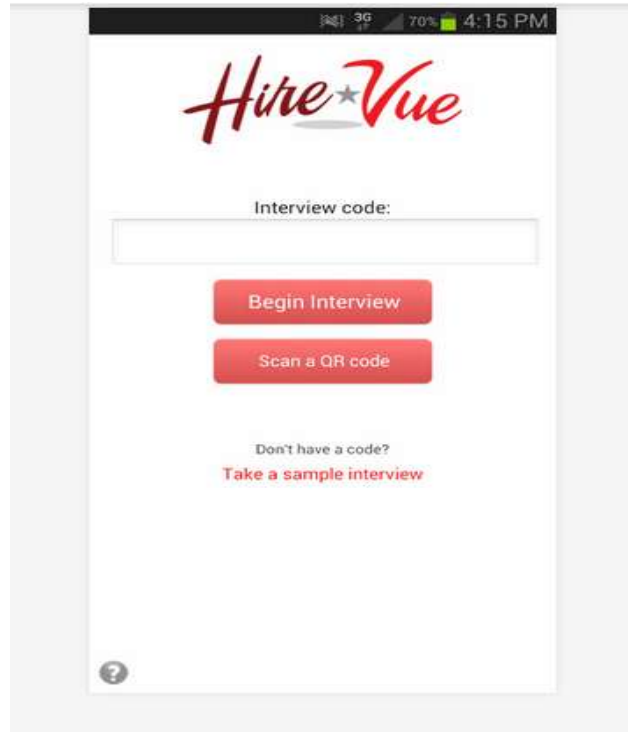


FIGURE 2.12 Page for candidates to enter the Interview code

Next, FIGURE 2.13 shows the confirmation page for the candidates to start the interview.

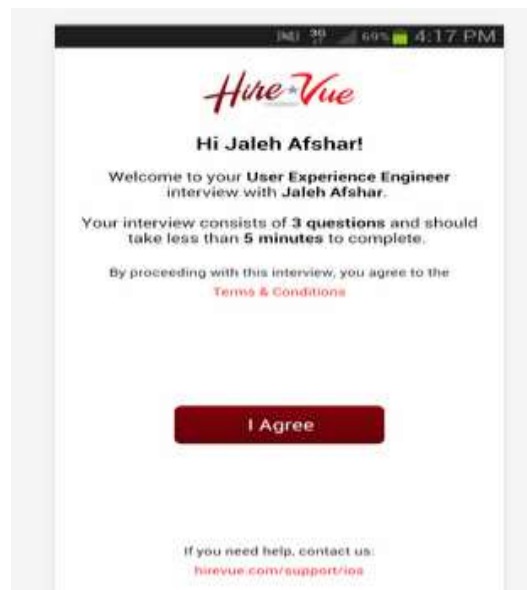


FIGURE 2.13 Confirmation page to start the interview process

FIGURE 2.14- 2.16 indicate three examples of the interview questions that has been set by the interviewers by using this mobile application and it also indicates the start of the interview process. After the candidates answered the interview questions, the interview process is considered ended. Figure 2.16 shows an interview question that requires the candidates to speak and the HireVue application will record the video of the candidates answering the question. Then the interviewers can assess the applicants' personality through the discussion with other management employees in the company (LADIMEJI, 2012).



FIGURE 2.14 Example of the interview questions that has been set by the interviewers



FIGURE 2.15 Interview questions that has been set by interviewers (Multiple Choice Question)

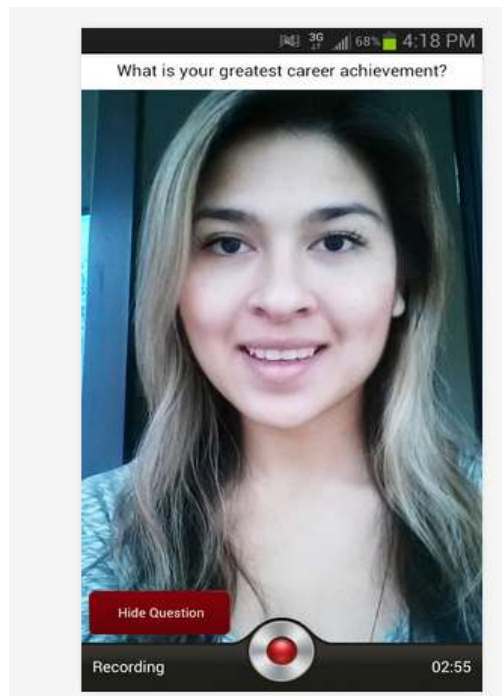


FIGURE 2.16 Different interview questions that requires the candidates to speak

FIGURE 2.17 shows that out of 877 users, there are around 588 of the users commented that they are very satisfied with Hirevue application (HireVue, 2015).

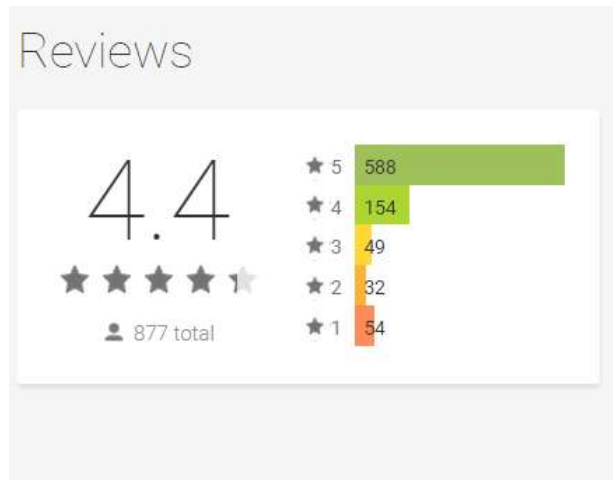


FIGURE 2.17 Users' reviews on Hirevue mobile application (HireVue, 2015)

FIGURE 2.18 shows some of the comments from the Hirevue application's users.

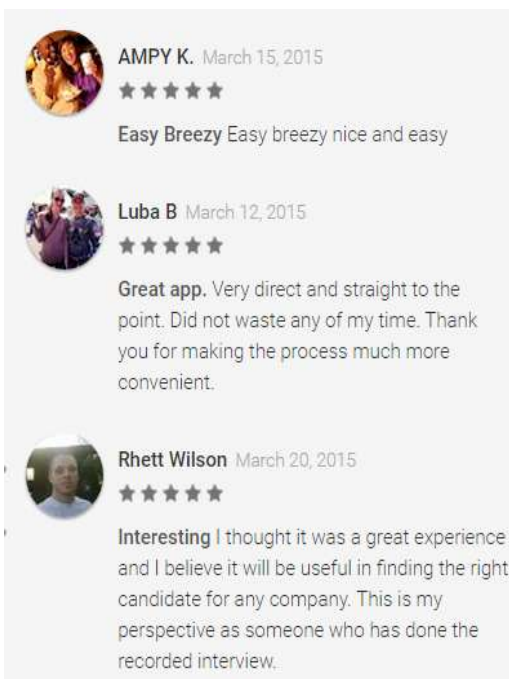
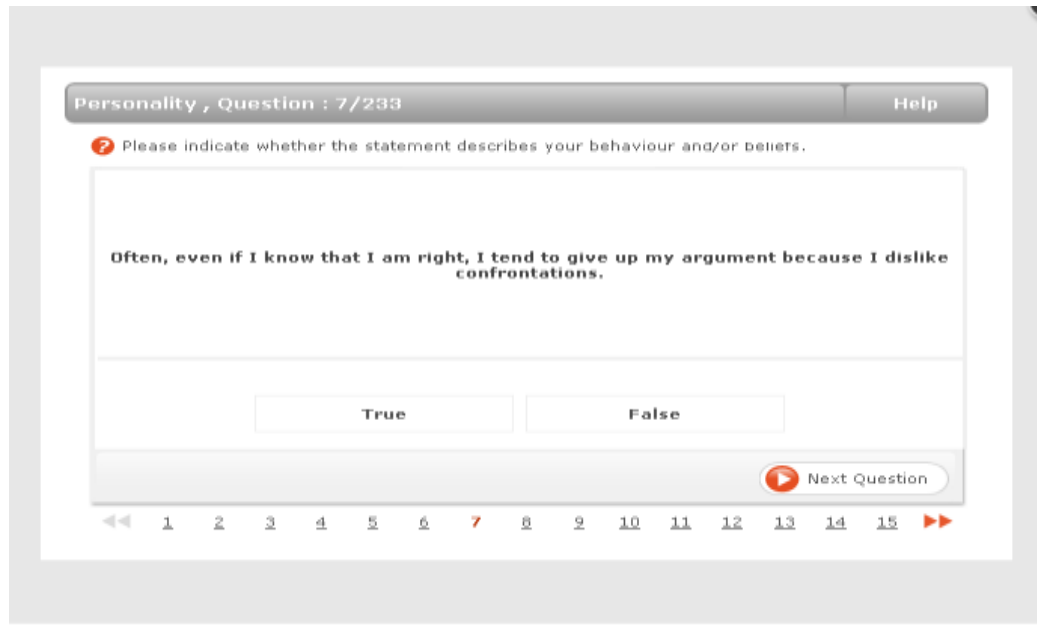


FIGURE 2.18 Users' comments on HireVue application

## 2.6.2 Automated Personality Inventory System for Job Applicants

FIGURE 2.19 shows one of the questions from an online personality test for the job applications. It requires the candidates to answer all the personality question and the system will then analyze the candidates based on the answers that they give.



The screenshot displays a web-based personality test interface. At the top, a grey header bar contains the text "Personality , Question : 7/233" on the left and a "Help" button on the right. Below the header, a red question mark icon is followed by the instruction: "Please indicate whether the statement describes your behaviour and/or beliefs." The main content area features a large white box with the statement: "Often, even if I know that I am right, I tend to give up my argument because I dislike confrontations." Below this statement are two buttons labeled "True" and "False". At the bottom right of the question area is a "Next Question" button with a red play icon. At the very bottom, a navigation bar shows a sequence of numbers from 1 to 15, with the number 7 highlighted in red, indicating the current question. Navigation arrows are present at the far left and right of this bar.

FIGURE 2.19 Examples of Personality Questions

FIGURE 2.20 shows the personality test report after the candidate answered all the test questions.

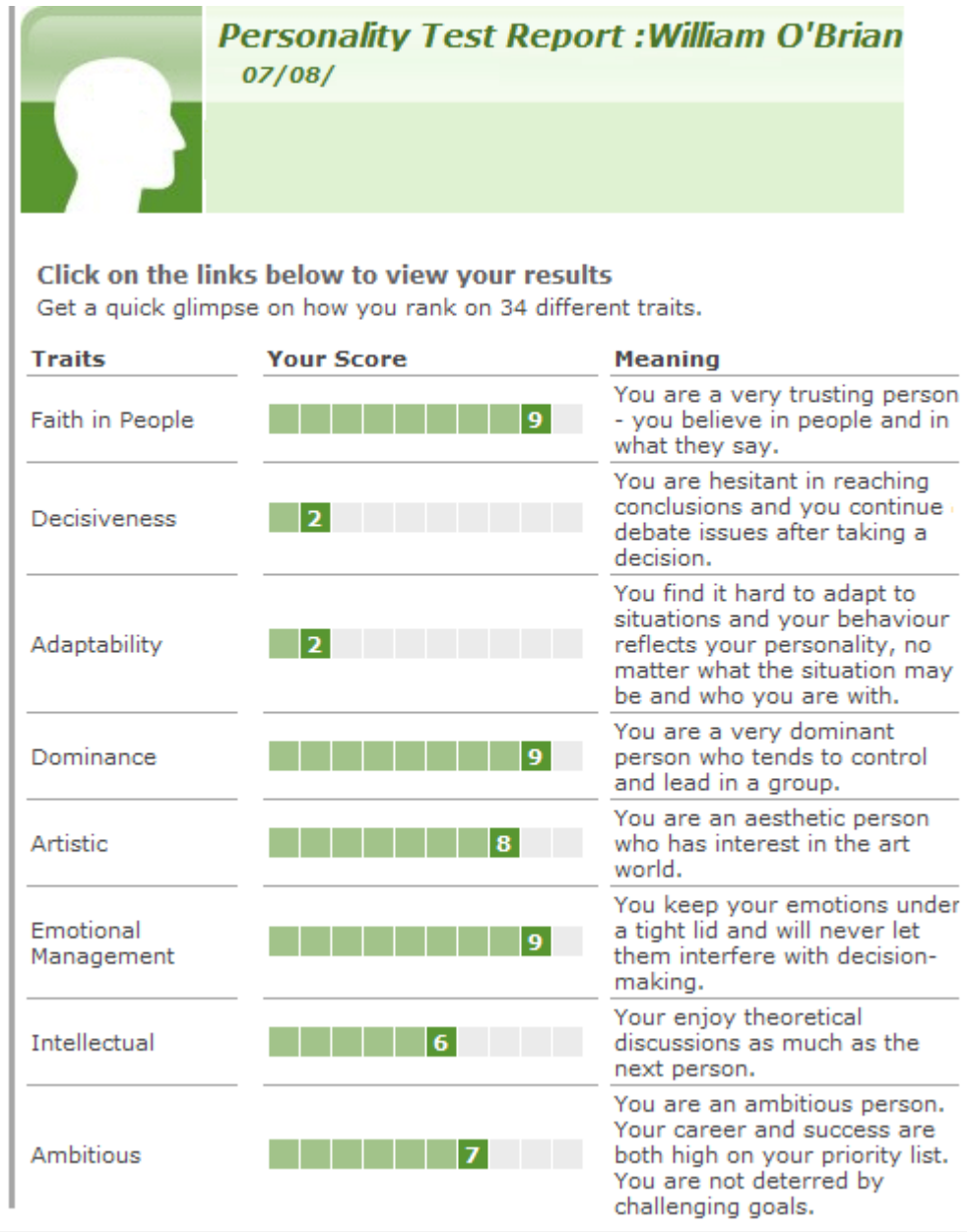


FIGURE 2.20 Report generated from online personality test

One of the junior line manager commented that this is a very useful test as it gives a clear analysis on the personality of the candidates (JobTestPrep).



### 2.6.3 Personality Trait Test

FIGURE 2.21 shows a mobile application that helps one to analyze his or her personality traits based on the answers that he or she gives. It is similar to the previous automated personality inventory system as shown in Chapter 2.3.2. The main difference is that this personality trait test is a mobile application whereas the automated personality test in preceding chapter is an online test. The developer of this application is Asditya Prakash and this mobile application can also be used in recruitment when the interviewers use the result of this mobile application to make hiring decision.

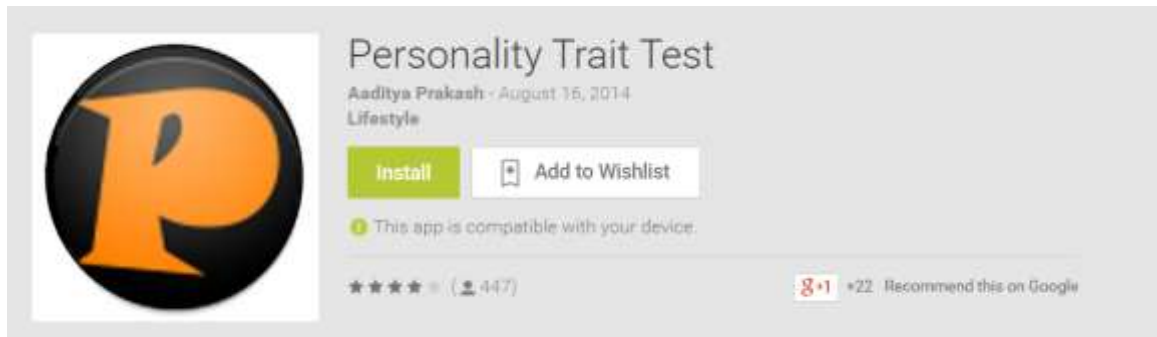


FIGURE 2.21 Interface of Personality Trait Test Mobile Application  
(Prakash, 2014).

Source: <https://play.google.com/store/apps/details?id=com.aadi.personalitytraittest>

FIGURE 2.22 shows the confirmation page before the personality test is started.

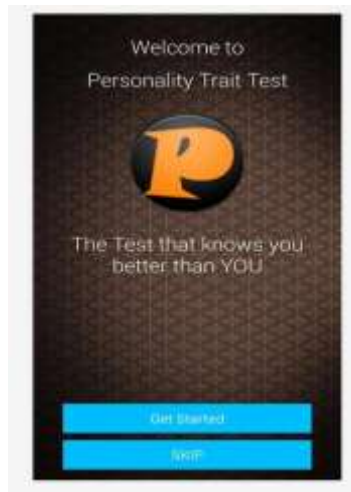


FIGURE 2.22 Confirmation Page before starting the Personality Test

FIGURE 2.23 is the menu page of the mobile application. The candidates can choose to have quick test or full test and they can also look at their user results after finishing the testing.



FIGURE 2.23 Menu Page of the Mobile Application.

Besides, they can also choose to learn more about the 16 personality traits which are INTP, ISTJ, ESTJ, ISFJ, ESFJ, ISTP, ESTP, ISFP, ESFP, ENTJ, INTJ, ENFJ, INFJ, ENTP, ENFP as shown in FIGURE 2.24. These are the different personality traits that are needed for different job positions.



FIGURE 2.24 Different personality traits for different job positions

FIGURE 2.25 shows the users' review on this mobile application and FIGURE 2.26 is the comments from some of the users. For this personality assessment application, there are 265 out of 528 users stated that the results are very accurate and thus, they are satisfied with the mobile application.

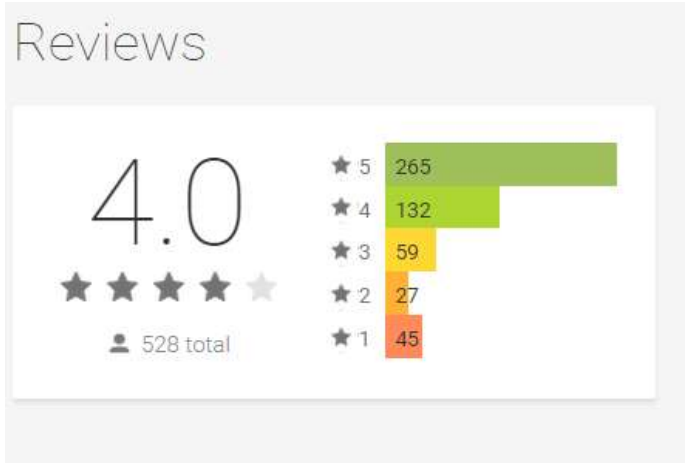


FIGURE 2.25 Users' reviews on Personality Trait Mobile Application

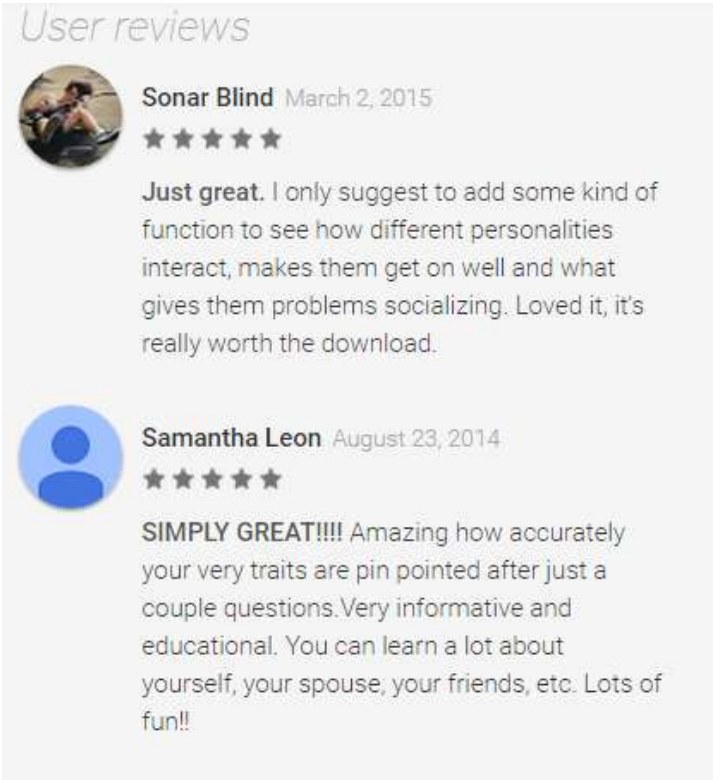


FIGURE 2.26 Users' comments on Personality Trait Test (Prakash, 2014).

## **2.7 DISADVANTAGES OF THE CURRENT TECHNOLOGIES**

To discuss about the disadvantages of the HireVue mobile application, the judgments made purely depends on the interviewers and this increases the probability that bias in recruitment may occur. Besides, for the online personality test and also the personality trait test mobile application, the result will be less accurate when the candidates can actually fake their answers when doing the test. HR-Guide.com (n.d.) stated that candidates can choose to answer the questions in a way that they think it would result in a greater outcome. Therefore, there is a need for a system or mobile application that can really improve the accuracy of the hiring decision by making a more accurate analysis.

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 RESEARCH METHODOLOGY**

One of the research methodologies used is conducting an interview session with senior executives in Human Resource Department of the two organizations named Universiti Teknologi Petronas (UTP) and Rimbunan Hijau Group of Companies (RH Group). The interview session with senior executive in RH Group is conducted through phone whereas the interview session in UTP is a face-to-face interview. For all the interview sessions, the interview questions were set by the author to improve the understandings on the recruitment process, current hiring problems and what the users suggest to use in order to solve the current problem. Next, to further explain about the interview session in UTP, the author has sent an e-mail to invite the senior executive in Human Resource Department for the interview session on 17 March 2015 and the interview session has then been conducted on 23 March 2015 in Human Resource Department in UTP. Specifically, the interview session was from 11.00am until 11.35am and the main discussion during the interview session is about the whole recruitment process in UTP, current system or current ways used to evaluate the candidates as well as the interviewee's feedbacks on the proposed system.

Moreover, an online survey has also been conducted on 16 March 2015 to collect the participants' feedbacks on the proposed system named SMART Recruiters' Helper. The questions in the survey form were prepared after the author studied more about the techniques to prepare a good survey form. This survey form was divided into three sections. The first section is to know about the participants' background information and the second section is to understand their current hiring problems.

The last section is to collect the participants' feedbacks on the proposed system. After the survey form has been completed, the link of this online survey form was sent to Human Resource Department from 50 companies through e-mail. There was around 36 respondents from 30 companies after a week. The survey form was then distributed in Block 5 as most of the Master students from Pakistan were doing their research in this place. There were around 14 of the Master students stated that they have hiring experience when working in Pakistan and they have filled in the printed survey forms on 23 March 2015. Therefore, on 23 March 2015, the number of respondents for this survey became 50.

### 3.2 SYSTEM DEVELOPMENT METHOD

The development methodology used in this project is Prototyping methodology. FIGURE 3.1 shows the Prototyping Model which is a systems development method in which the first prototype is built, tested, and then reworked as necessary until an complete product is finally created. It is a trial-and-error process that takes place between the developers and the users.

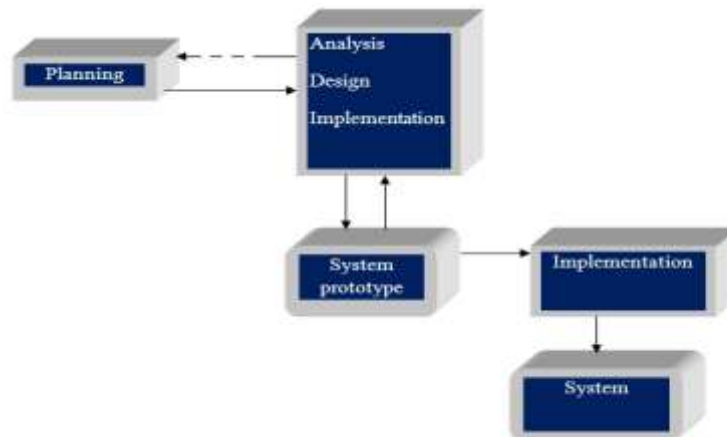


FIGURE 3.1 Prototyping Methodology Model

FIGURE 3.2 shows the steps that are involved in the Prototyping Model. Firstly, the first design for Smart Recruiters' Helper system will be created.

Based on this design, a prototype of the system is constructed and the users will first evaluate the first prototype, noting its strengths and weaknesses, what needs to be added, and what should to be removed. According to their comments, the first prototype will be modified and a second prototype of the new software is produced. After that, the second prototype will be evaluated again and the preceding steps are iterated as many times as necessary, until the users are satisfied that the prototype represents the final product desired. Lastly, after the final software is built, it will be thoroughly evaluated and tested.

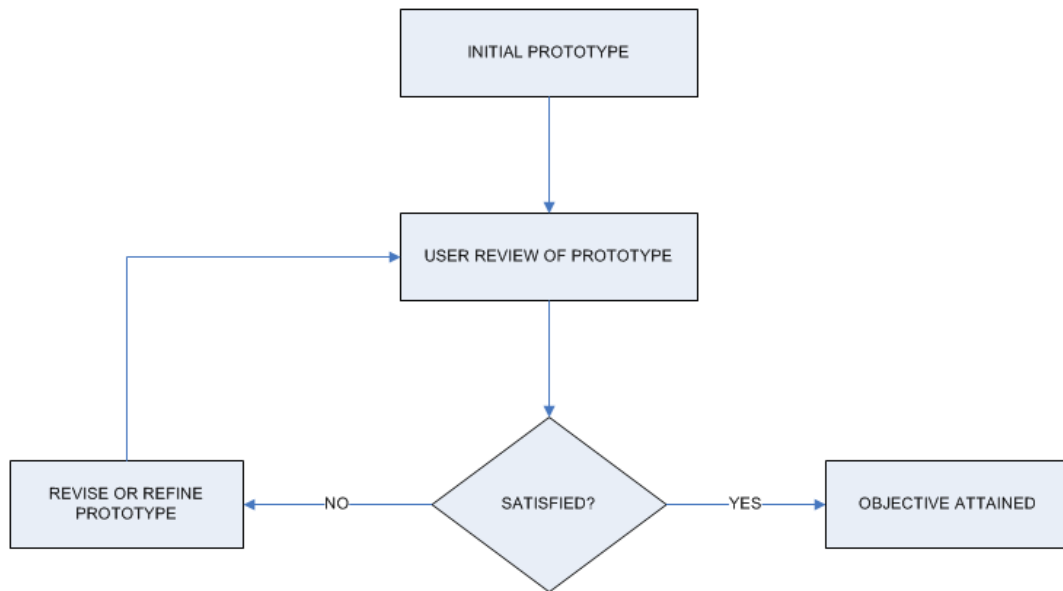


FIGURE 3.2 Steps in Prototyping Model

### 3.3 SYSTEM ARCHITECTURE

In this project, the combination of data-centered and client-server architectural model is used. A client-server system model is organized as a set of services and associated server(s) and clients that access and use the services. The server or one of the server contains database. FIGURE 3.3 shows the system architecture in this project.

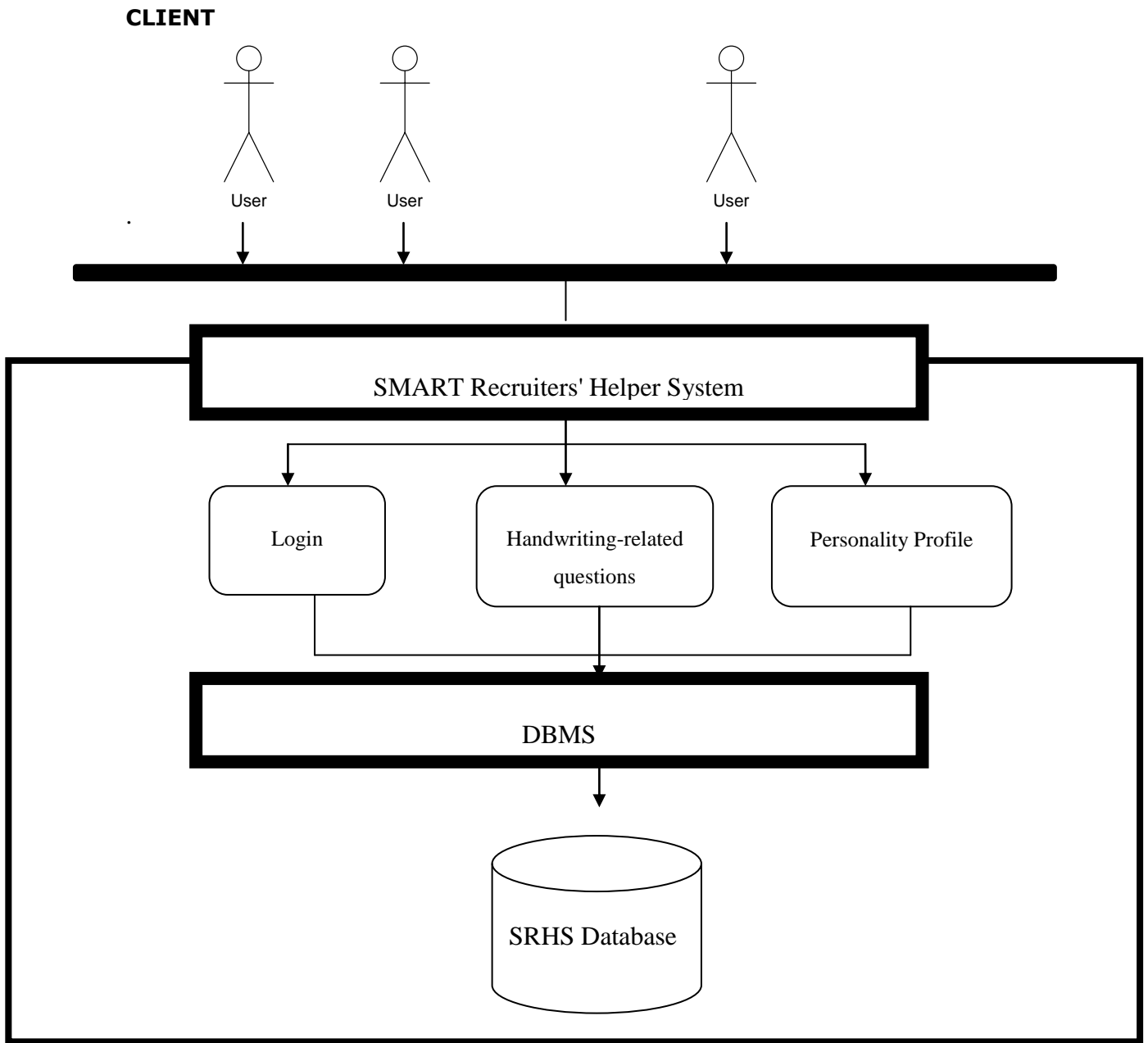


FIGURE 3.3 System architecture



## **3.4 PROJECT ACTIVITIES**

### **3.4.1 Planning**

In this phase, the author has planned on the project activities that will be conducted for the completion of the project. Next, a schedule management plan has also been developed to estimate the duration for each of the project activities in order to make sure the project will be completed on time. Besides, a Gantt chart is used to show the start and finish dates for all the project activities.

### **3.4.2 Analysis**

During the analysis phase, the author conducted an internet research to collect more information on the current hiring problems and also to identify the system requirements. Besides, an interview and survey has also been done to collect the end users' requirements.

The end users will be the Human Resource Professionals who involve in recruitment of lecturers and after collecting all the interview and survey information, the author started to come out with a report that summarizes all the participants' feedbacks on the proposed system in order to know more about the users' requirements.

### **3.4.3 Design**

In design phase, the author started to design a user interface for the proposed system. Internet research has been done in order to come out with a design of a user-friendly system. Besides, as the system is expected to come with the handwriting related questions that help to analyze the candidates, the author has designed all the questions that will be used in the end of this phase.

### **3.4.4 Implementation**

In this phase, the author started to learn more about Microsoft Access before developing the system. The first prototype was developed in the end of implementation phase.

### **3.4.5 Testing**

After developing the first prototype, the author has conducted a user testing with the executive in Human Resource department and the feedbacks has been recorded before revising the developed system.

Next, the project will back to the implementation phase to keep improving the prototype until a satisfied system is developed.

### 3.5 TOOLS (EQUIPMENT, HARDWARE, ETC) REQUIRED

The hardware tools required in this project include a network of computers (desktop) that is connected to Internet. To explain the system information of the computer, the operating system used is Microsoft Windows 7 Home Premium and the version of 6.1.7601 Service Pack Build 7601 is used. Besides, the System Model is K53SM with the Installed Physical Memory of 6GB.

The software used in this project is Microsoft Office Visio 2003 in order to create all the charts and diagrams during the analysis phase. Microsoft Access will also be used for developing the SMART Recruiters' Helper.

### 3.6 GANTT CHART

TABLE 3.1 Gantt Chart of the project

Activities	No of Weeks											
	1	2	3	4	5	6	7	8	9	10	11	12
<b>PLANNING</b>												
Identify the system feasibility												
Develop Project Activities Planning												
Develop Work Management Plan												
<b>ANALYSIS</b>												
Information Gathering												
Requirements Gathering: <ul style="list-style-type: none"> <li>• Interview</li> <li>• Survey</li> </ul>												
<b>DESIGN</b>												

<b>System Interface design</b>												
<b>Database design</b>												
<b>IMPLEMENTATION</b>												
<b>System Construction</b>												

## **CHAPTER 4**

### **RESULTS AND DISCUSSION**

#### **4.1 FINDINGS FROM INTERVIEW SESSION**

##### **4.1.1 Human Resource Department in Universiti Teknologi Petronas**

During the interview session, a senior executive in Human Resource Department in Universiti Teknologi Petronas stated that the evaluation of the personality is very important for those who want to apply for a Doctor of Philosophy (PhD) degree. The reason is that one needs to have some specific personality traits in order to be succeeding in their PhD studies. The main personality traits that will be evaluated include high durability, high curiosity and their high interest in doing the research. For other job positions, Universiti Teknologi Petronas actually emphasizes on the candidates' capability, and thus there is no personality test for all the candidates. They will only evaluate the candidates' personalities during the interview process. Besides, the senior executive also stated that some of the employees has a bad attitude in work even though they may be very capable.

This can be a huge problem to the company as the personalities can only be analyzed accurately when the candidates has already been hired. Therefore, she agreed that if the proposed system is able to analyze the candidates accurately, it will be useful for the company.

#### **4.1.2 Human Resource Department in Rimbunan Hijau Group of Companies**

Below shows the information collected through another phone interview session with another senior executive in Human Resource Department in Rimbunan Hijau Group of Companies.

1. Which criteria is important for this company when selecting the employees during recruitment?

- Honesty
- Ability to work with others
- Hard work

2. What are the recruitment processes in this company?

- First, obtaining the candidates' information through the resume. Past working experience is very important for us.
- Then, match their skills with the position.
- Call those who are selected for interview.
- Both the Human Resource Manager and Departmental Manager will be involved in interviewing process.
- They analyze their personalities based on personal experience.
- After discussion, select the employee and Human Resource will contact the selected employee.

3. Can I know how accuracy is the company's hiring decision for these few years?

- There is around 3 out of 10 of the employees are wrong hire.

4. What are the reasons of recruiting these wrong employees?

- They cheat on their resumes to make it look impressive to the eye of the organization they wanted to work with.
- Personality test is not really useful for us as the candidates can cheat on the test. We tried few years ago.
- What they answer during interview is different from what they do after work.

5. Is psychology important in order to select the right employee?

- Yes.

6. How the Human Resource Manager analyze the candidates during interview?

Based on personal experience.

7. What do you think to have a system that helps you to assist the interviewers?

We are satisfied for the interview process now. However, if the information is accurate and it is proved to be able to help us to select the right employees, of course it is good for us.

## **4.2 FINDINGS FROM SURVEY**

This chapter will discuss about the feedbacks obtained from 50 respondents through an online survey on the topic of the hiring decision and also the acceptance of the proposed system named SMART Recruiters' Helper. In fact, all the respondents who involved in this survey must have experienced in recruiting job applicants for their companies before. There are 3 sections in this chapter. The first section will discuss about the participants' background information as shown in FIGURE 4.1- 4.2 and Table 4.1. First, FIGURE 4.1 shows the job positions of these 50 respondents.

#### 4.2.1 Respondents' background information

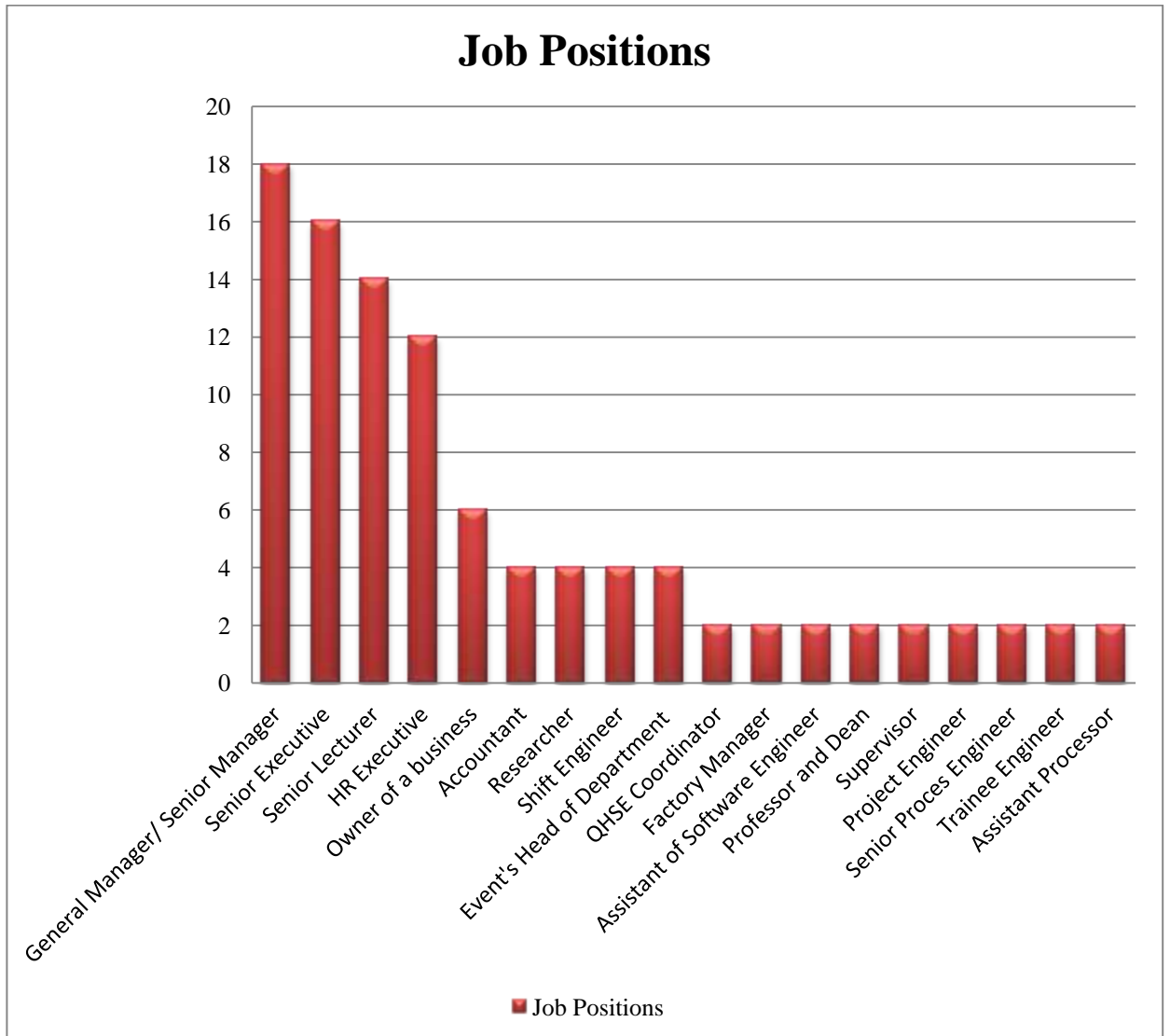


FIGURE 4.1 List of the job positions of all the Respondents

According to the figure above, 18% of the respondents are managers and this indicates that managers actually play a significant role in helping the companies to select the right job applicants for the company.

FIGURE 4.2 shows the years of experience of the respondents in their work.



FIGURE 4.2 Respondents' years of experience in work

Referring to the FIGURE 4.2, 28% of the respondents have 0 to 3 years of experience in work and 20% of the respondents have 13 to 15 years of experience in work. This indicates that the companies give the opportunity for the employees to involve in the recruitment process even though they have no much experience in work. Different recruiters with different years of experience may have different way of thinking and this also leads to different judgment made on the same candidate.



## Respondents' Companies/ Organization

1. Technip
2. Dutch Lady Milk Industries
3. TOA Paint Products Sdn Bhd
4. TL Office Automation
5. Groupon Malaysia
6. Soon Lee Motor
7. SLA Engineering
8. Kilang Papan Soon Lee
9. Brother Air-Cond. Services
10. Klass Fashion Boutique
11. Public Bank Berhad
12. Syarikat Pengusahaan Bahagia
13. Syarikat Setia
14. Power Engineering Equipment & Services
15. Syarikat Autotrade Trading
16. Sunny Biogreen Sdn Bhd
17. Syarikat Udin Engineering Works
18. Rimbunan Hijau Groups of Companies
19. University college of technology Sarawak
20. Power Engineering Timber Contractor Co
21. Welltrade Equipment Spares Sdn Bhd
22. Merstrade Sdn Bhd
23. Usaha Kencana Sdn Bhd
24. WFM Trading Sdn Bhd
25. Universiti Teknologi Petronas
26. Herbalife
27. Masood Tentile Mills
28. University of Science & Technology Bannu
29. King Saud University Saudi Arabia
30. Lyallpur Chemicals & Fertilizers Jaranwala- Pakistan
31. Petrodar Operating Company- Sudan (PETRONAS- (NPC)
32. NFC Company
33. Unicol Distillery Pakistan
34. NFC Institute of Engineering
35. Al- Abbas Cement Industries, Pakistan
36. University of Khartoum- Sudan
37. HMB Tanneries
38. The University of Faisalabad, Pakistan
39. LCFL (PVT) LTD. Jaranwala, Pakistan

TABLE 4.1 List of Companies

#### 4.2.2 Current Hiring Problems

The second section will discuss about the current hiring problems. FIGURE 4.3 shows the job position that the companies recruit the most.

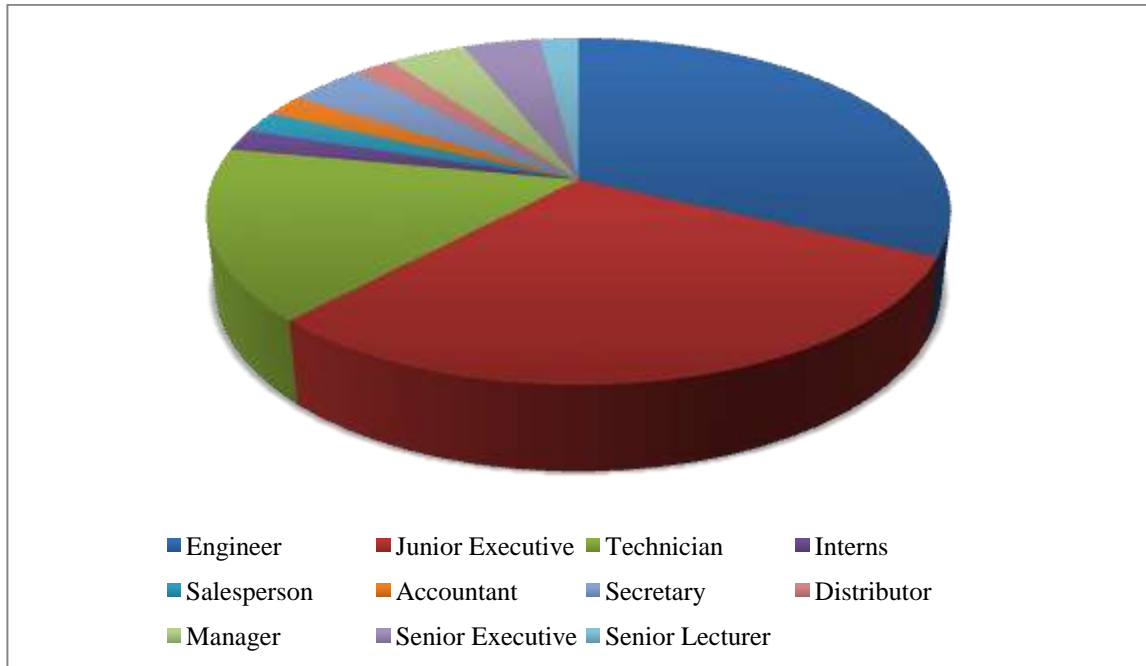


FIGURE 4.3 Job positions that the companies recruit the most

From the figure above, it shows that Engineer is the job position that the 39 companies recruit the most. This indicates a greater demand for Engineer in today world. Next, 30% of the companies said that they recruit more Junior Executive in their companies.

FIGURE 4.4 reveals the current system or the current way that the companies use to select the employees for the companies.

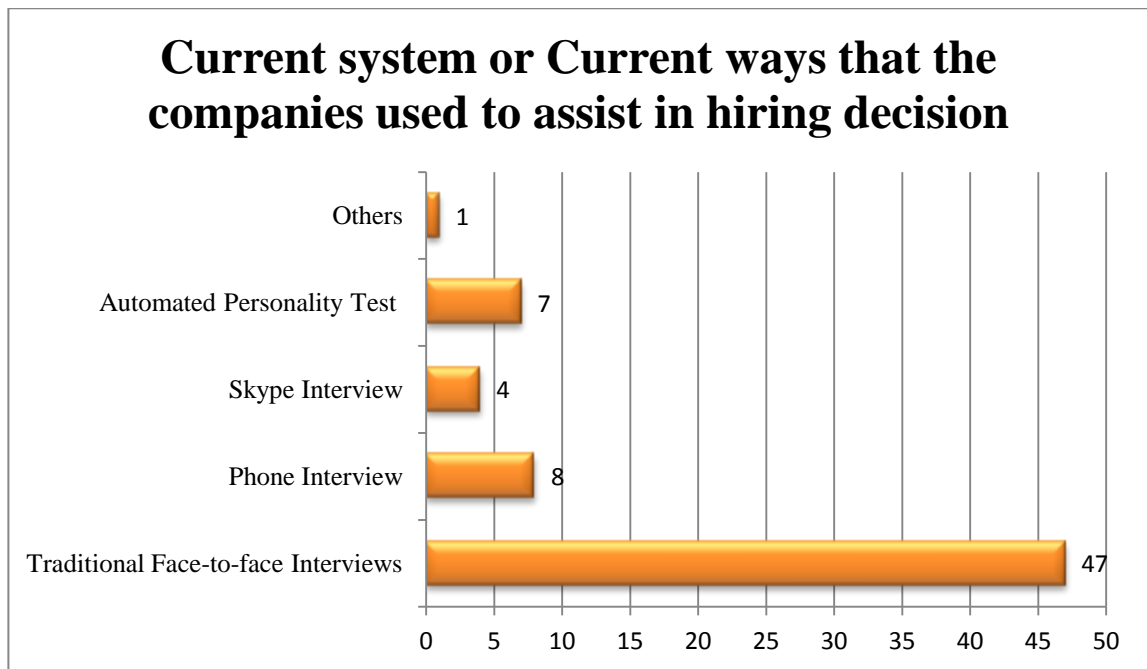


FIGURE 4.4 Current systems or the current ways that the companies are using

Referring to the figure above, traditional face-to-face interviews is the most popular way that the companies use in order to assist them in making the hiring decision. Besides, 8 companies are actually using traditional face-to-face interviews and phone interview during the recruitment process and they are strongly believed to make the hiring decision based on their own assumptions and experience. There are also 2 companies that are using all the traditional face-to-face interviews, phone interviews, Skype interview and personality test in order to improve the accuracy of the hiring decision.

FIGURE 4.5 shows the recruiters' satisfaction level on the current system or current way used.

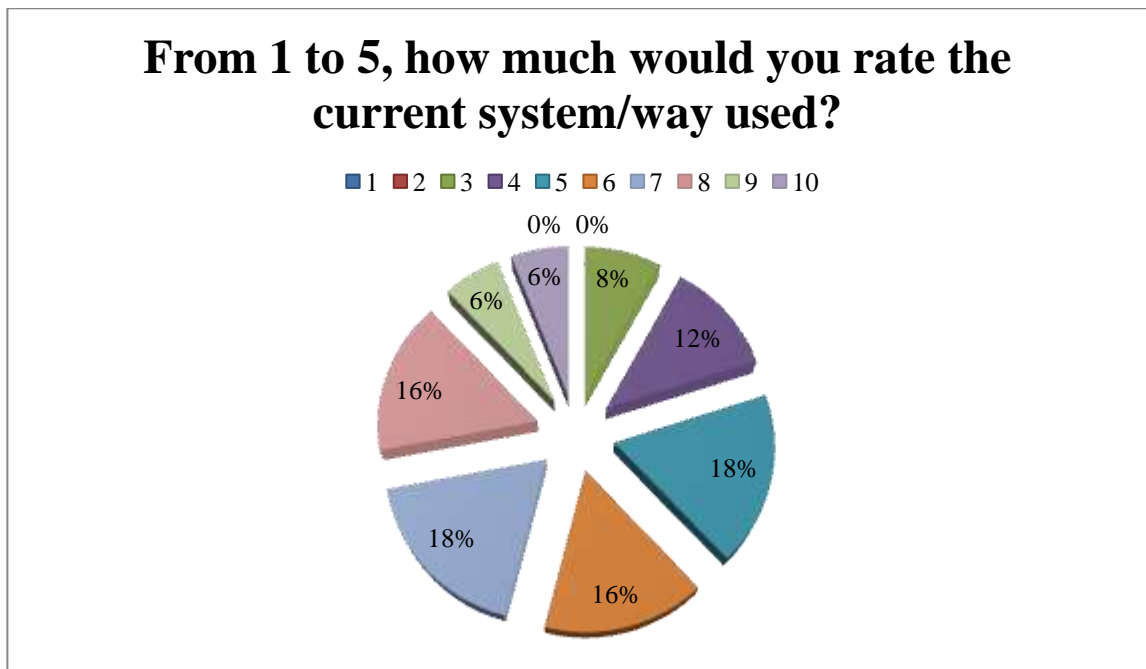


FIGURE 4.5 Recruiters' satisfaction level on the current system used

This survey shows that 18% of the respondents give a 5 rating for the current system used and there is only 6% of the respondents stated that the current system used is very satisfying by giving a rating of 9 to 10 for the system. Therefore, we can conclude that there is still a room of improvement for all the current system used.

FIGURE 4.6 indicates the probability of a company hiring a wrong employee by using the current system or current way.

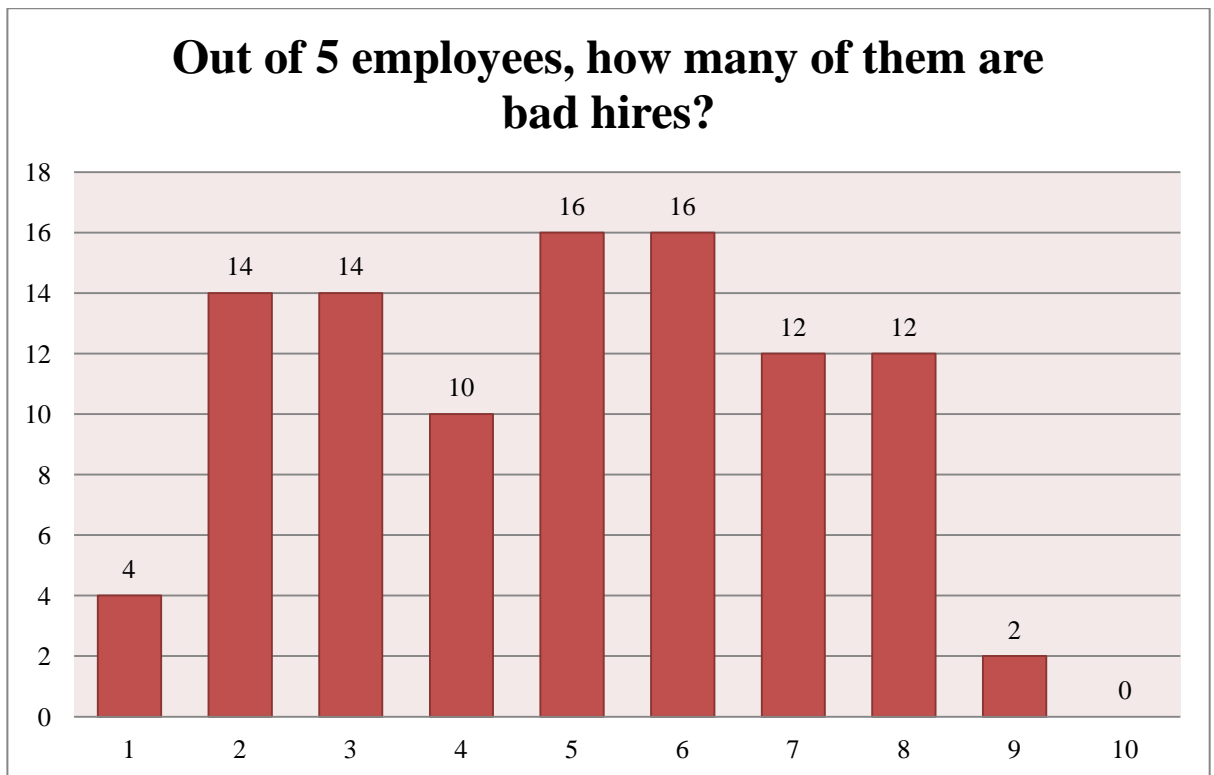


FIGURE 4.6 Percentage of hiring a wrong hire

Referring to the figure above, it shows that all the companies have experience in hiring one or more than one wrong employees. 58% of the respondents reported that out of 10 employees, there are around 6 to 10 employees are wrong hire. This indicates that most of the companies are actually facing the hiring problems.

### 4.2.3 Respondents' feedbacks on the proposed system

The last section shows the respondents' feedbacks on the proposed system as shown in FIGURE 4.7- 4.10.

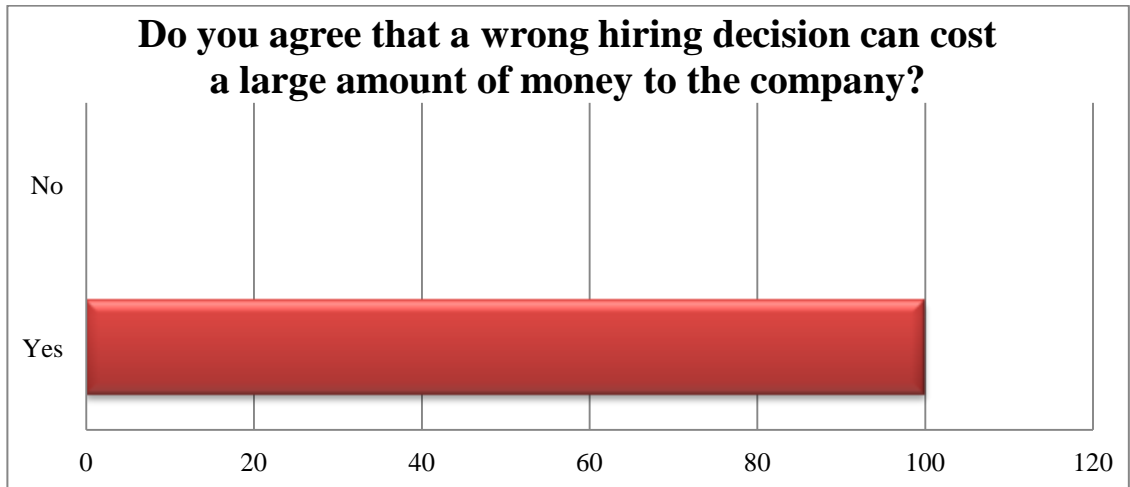


FIGURE 4.7 Respondents' feedbacks on the wrong hiring decision

FIGURE 4.7 shows that 100% of the respondents agree that a wrong hiring decision can bring a huge impact to the company. Therefore, making an accurate hiring decision is undeniably important for almost all the business in this world.

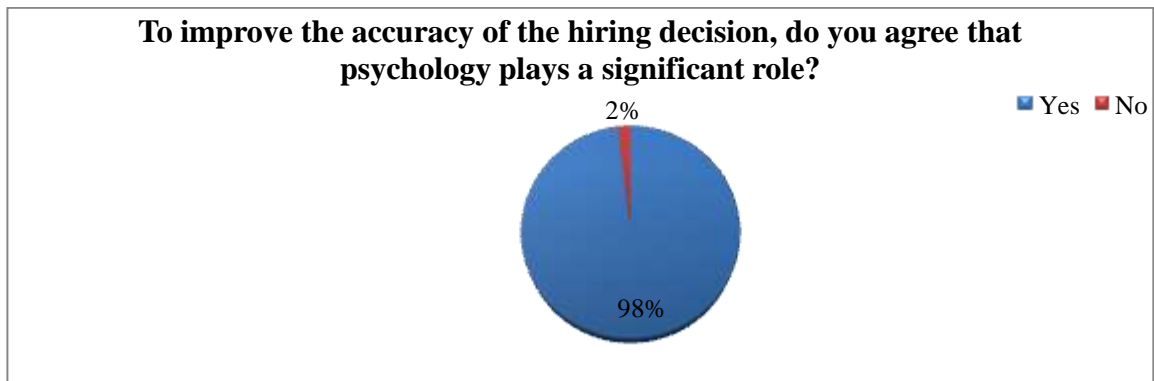


FIGURE 4.8 Respondents' feedbacks on the importance of the psychology in the recruitment process

Figure above shows that 98% of the respondents agree that psychology is very important to improve the accuracy of the hiring decision.

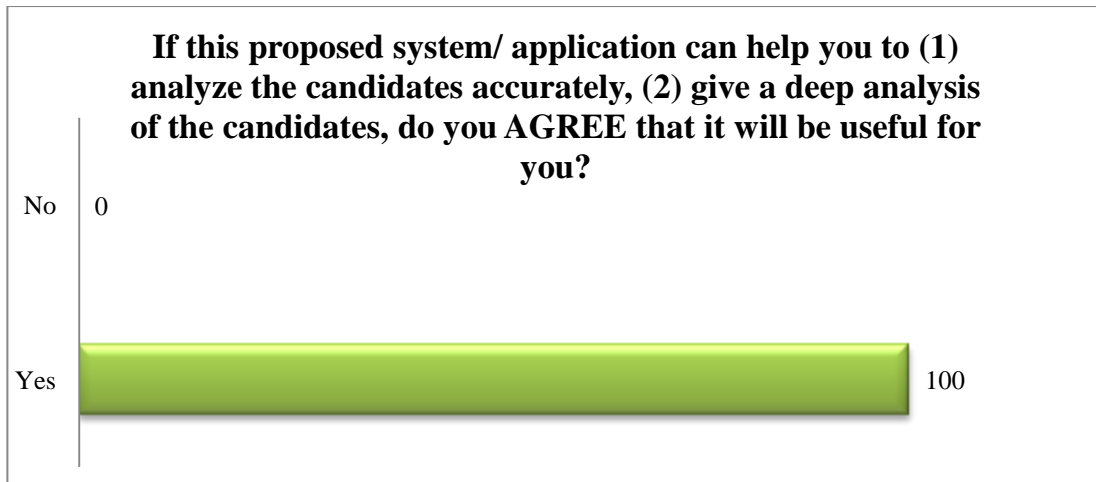


FIGURE 4.9 Respondents' feedbacks on the proposed system

Figure above indicates that 100% of the respondents agree that the proposed system can be very useful if it can help to analyze the candidates accurately.

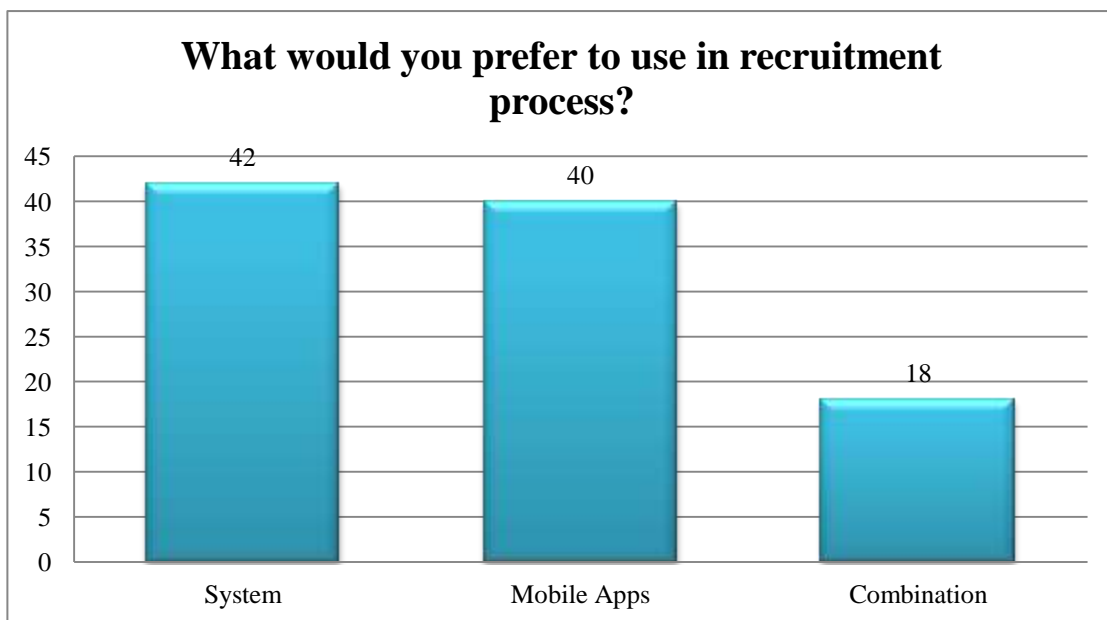


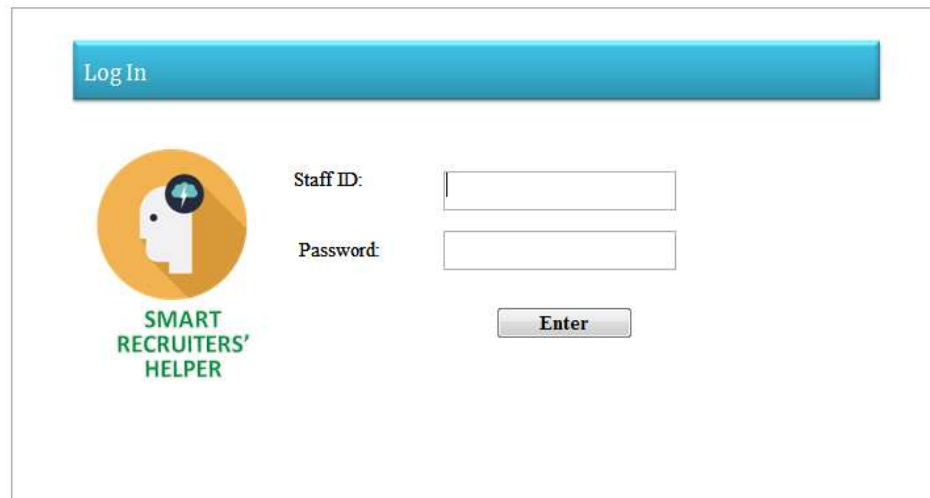
FIGURE 4.10 Respondents' preferred platform for recruitment process

FIGURE 4.10 indicates that 42% of the respondents think that system will be the best to be used during the recruitment process whereas 40% of them preferred to use mobile application. Moreover, there is also 18% of the respondents prefer to use both system and mobile application during the recruitment process.

This chart helps the author to study the respondents' preferred platform, and thus make selection on which one to be used for the proposed project.

### 4.3 SYSTEM INTERFACE

The system is called SMART Recruiters' Helper. It was developed with English language. FIGURE 4.11 shows the interface of the login page.



The screenshot shows a login interface for the 'SMART RECRUITERS' HELPER' system. At the top, there is a blue horizontal bar with the text 'Log In'. Below this, on the left, is a circular logo containing a white silhouette of a human head with a blue gear inside, and the text 'SMART RECRUITERS' HELPER' in green below it. To the right of the logo, there are two input fields: the first is labeled 'Staff ID:' and the second is labeled 'Password:'. Below these fields is a grey button with the text 'Enter'.

FIGURE 4.11: Login page

After the recruiter log in the system, the candidates details which include candidates' name and job position are needed before the recruiter proceed to the candidate's evaluation process. Besides, the recruiter can also choose to view, edit or delete the existing record in the menu page as shown in FIGURE 4.12. Not only this, the system also allows the recruiter to read more information about the handwriting analysis in this menu page.





FIGURE 4.12: Menu page

Then, the system will come out with a number of pages consisting of the questions about the candidate's handwriting as shown in FIGURE 4.13-19. FIGURE 4.13 asks about the candidates' handwriting slant of letters whereas FIGURE 4.14 asks about the candidates' handwriting baseline.

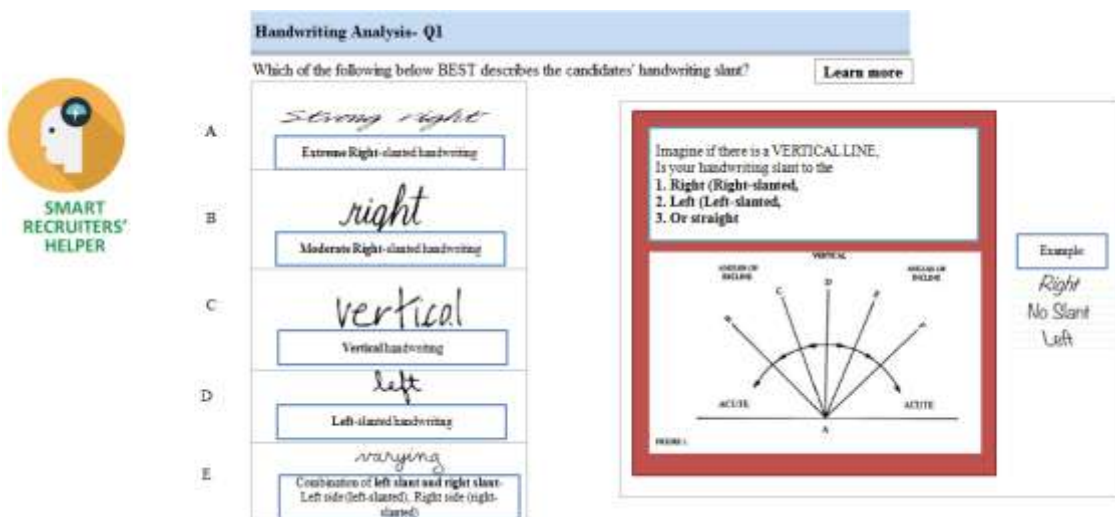


FIGURE 4.13: Question about the candidate's handwriting slant



**Handwriting Analysis- Q2**

Which of the following below BEST describes the candidate's handwriting baseline? [Learn more](#)

A *normally straight baseline*  
Handwriting goes straight

B *ascending baseline*  
Handwriting goes UP

C *descending baseline*  
Handwriting goes DOWN

D *meanders up and down*  
Handwriting goes UP & DOWN

Imagine if there is a HORIZONTAL LINE  
Is your handwriting goes to  
1. Upward  
2. Straight  
3. Downward

Example

Back

FIGURE 4.14: Question about the candidate's handwriting baseline



**Handwriting Analysis- Q3**

Which of the following below BEST describes the handwriting's spacing between the Letters? [Learn more](#)

A *An intelligent fool can make things bigger, more complex and more violent. It takes a touch of genius & a lot of courage to move in the opposite direction.*  
Widely spaced letters

B *An intelligent fool can make things bigger, more complex and more violent. It takes a touch of genius and a lot of courage to move in the opposite direction.*  
Closely spaced letters

Spacing between LETTERS

very loose  
loose  
normal  
tight  
touching  
Close spacing

The spacing between the letters is half or more than the letter width. If most of your letter width is 0.2cm, the spacing between letters is 0.1cm.

The spacing between the letters is less than half of the letter width. If most of your letter width is 0.2cm, the spacing between letters is less than 0.1cm.

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FIGURE 4.15: Question about the candidate's spacing between letters



**Handwriting Analysis- Q4**

Please take YES if the candidate's handwriting of the letter 'y' AND 'i' have hard right upstrokes as shown below. [Learn more](#)

Hard Right upstrokes

A. Yes

B. No

Focus on the letter y below


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FIGURE 4.16: Question about the candidate's letter y and i



**Handwriting Analysis- Q5**

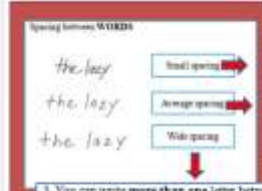
Observe the candidate's spacing between WORDS and choose the best describing his/her handwriting. [Learn more](#)

A.  Small spacing between words

B.  Average spacing between words

C.  Wide spacing between words

Spacing between WORDS



1. It is **NOT POSSIBLE** to write a letter between the words.  
- The letter width is more than the spacing between words.

2. You can write a letter between the words.  
- The letter width is equal to the spacing between the words.

3. You can write **more than one** letter between the words.  
- The letter width is much lesser than the spacing between words.

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FIGURE 4.17: Question about the candidate's spacing between words

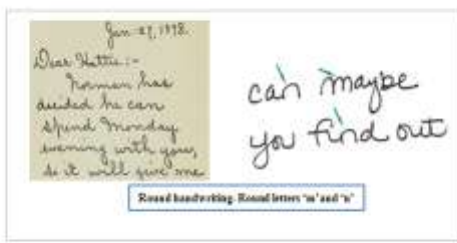


**Handwriting Analysis- Q6**

Observe the letter 'm' and 'n'. Are they rounded? Choose YES if m and n are obviously an inverted 'u'. [Learn more](#)

A. Yes

B. No

 Rounded handwriting: Rounded letters 'm' and 'n'

Example: (Look at m and n)

**m and n = inverted 'u'**

- Scrapbooking of course!
- Listening to music
- Going to the movies
- Sleeping in.
- Eating chocolate.
- Reading a good book.
- Staying in pyjamas.
- Enjoying my favorite drink.

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FIGURE 4.18: Question about the candidate's handwriting style




**Handwriting Analysis- Q7**


Observe the letter 'm' and 'n'. Are they sharp as  $\nabla$  or even sharper than  $\nabla$ ? [Learn more](#)

A. Yes

B. No

 Angular handwriting: Sharp letters 'm' and 'n'

Example: (Look at m and n)  
They are sharp as  $\nabla$  or even sharper than  $\nabla$ .



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FIGURE 4.19: Question about the candidate's handwriting style

The last section is the analysis report of the candidate's personalities as shown in FIGURE 4.20 after the recruiter finish answering all the handwriting questions. The system will calculate the suitability of the candidate for the job position and determine the candidates' positive traits as well as negative traits. Besides, if the interviewer wants to print the report, FIGURE 4.21 shows the sample of the printed report.

The screenshot displays the 'Personalities Report' interface. On the left is a navigation menu with 'Candidates' and 'System Study' sections. The main area shows 'Personal Details' for candidate 'Luxmi' (Job position: LECTURER). Under 'Analysis of Personalities', the suitability is 40.31%. 'DESIRABLE TRAITS' include 'Inspiring', and 'ADDITIONAL TRAITS' include 'Self-motivated'. Each trait is accompanied by a descriptive text box.

FIGURE 4.20: Analysis report of the candidates' personalities



**ABC COMPANY**  
05-1234567    abc@gmail.com  
Address: 13A, Lorong 123, .....  
Tm ABC, Malaysia.

**Personalities Report**

Candidate: **Luzmi**  
Apply for: **LECTURER**  
Suitability:  %

Suitability above is calculated based on the desirable personality traits of the lecturer.  
Main criteria include: Molyfal, Approachable, Concern for students, Inspiring,  
Fair and Impartial, Enthusiasm, Patient, Friendly and Sense of Humor.  
The result above shows that **Luzmi**

**Most hire-able**



FIGURE 4.21: Printed report of the candidates' personalities

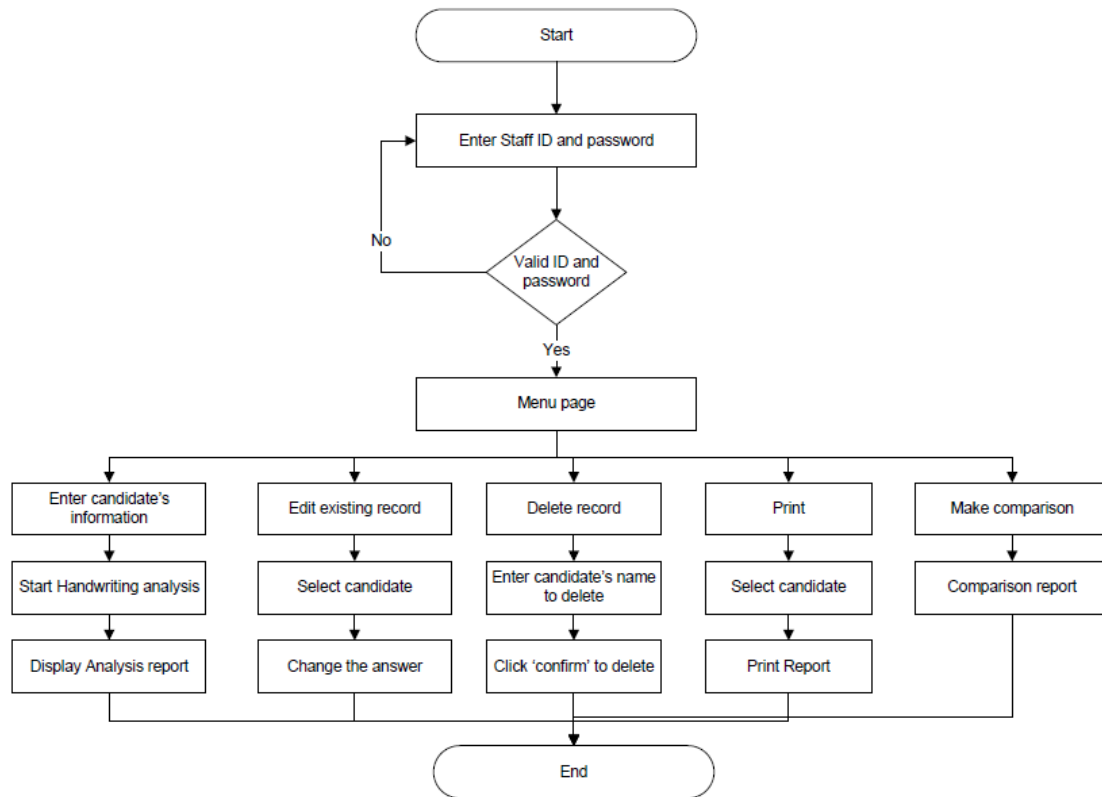


FIGURE 4.22: Flow chart of the system

According to the flow chart above, first the recruiter needs to enter the correct staff id and password to log in the system. Then the system will navigate the user to Main Menu page where the recruiter can choose to add new candidate, edit record, delete record, print record or make comparison. If they choose to add new candidate and enter the new candidate's information, system will come out with a number of pages consisting of the questions about the candidate's handwriting. After the recruiter completed all the questions, the system will display the analysis report of the candidate's personalities. If they choose to edit the existing record, first they need to select the candidate. After that, they can choose which questions to be edited and change the previous answer. If they choose to delete record, they need to enter the candidate's name and click 'Confirm' to delete the record. If they choose to print the report, then they can select the candidate and the system will print the report. If they choose to make comparison, the system will compare between the candidates.

## 4.4 SYSTEM EVALUATION OR USER TESTING

### 4.4.1 System evaluation or user testing

For system evaluation or user testing, an observation has been conducted. 7 respondents participated in this observation. FIGURE 4.23 shows one of the picture during the testing.



FIGURE 4.23: One of the pictures during the testing session



FIGURE 4.24: One of the pictures during the testing session

Each respondent was asked to use the system while his behaviour was recorded. TABLE 4.2 shows the summaries of the observations.

TABLE 4.2 Summaries of observations

Participant	Observations
Respondent 1 -Trainee in Human Resource department	<ul style="list-style-type: none"> <li>- found it difficult to answer the first few questions</li> <li>- used 20 minutes</li> <li>-can use the system in shorter time the second time she used the system</li> <li>-commented that the system is 65% accurate</li> <li>-stated that the environment when she writes is bad</li> <li>-Put many files behind the paper when writing</li> <li>-stated that this affects her result</li> </ul>
Respondent 2 Trainee in Human Resource department	<ul style="list-style-type: none"> <li>-can answer the questions well</li> <li>-did not realize that there is a button that can be clicked to see her personality traits</li> <li>-commented that the result is quite accurate</li> </ul>
Respondent 3 Trainee in Human Resource department	<ul style="list-style-type: none"> <li>-can answer the questions in 15 minutes</li> <li>-got 0% of suitability percentage</li> <li>-commented that it is accurate</li> </ul>



<p>Respondent 4  -2 years of working experience  -Tuition teacher</p>	<ul style="list-style-type: none"> <li>- seemed really excited to see the system.</li> <li>- able to answer the questions</li> <li>- Use 15 minutes to answer.</li> <li>- Take picture of the results and commented that the result is 90% accurate.</li> </ul>
<p>Respondent 5  -3 years of working experience  -Junior executive in Human Resource department</p>	<ul style="list-style-type: none"> <li>- interested while using the system</li> <li>- cannot answer the first three questions.</li> <li>- can answer after reading the guidelines</li> <li>- used 15 minutes to answer.</li> <li>- can use the system well after several times repeating the learning.</li> <li>- commented that he got the 80% accurate analysis report</li> <li>- very amazed that the system can tell his personalities</li> <li>- wanted to know more about handwriting analysis</li> <li>- introduced the system to other colleagues in Human Resource department</li> </ul>
<p>Respondent 6  -5 years of working experience  -Senior executive in Human Resource department  -Involved in recruitment</p>	<ul style="list-style-type: none"> <li>-very excited to use the system after the colleague introduce her the system</li> <li>-read all the guidelines and can answer the questions</li> <li>-commented that the system gives the result that other personality application did not give</li> <li>-give suggestions on the design of the system</li> </ul>

Respondent 7 -8 years of working experience -Senior executive in Human Resource department -Involved in recruitment	-answered the questions in 15 minutes -stated that the result is 80% accurate
--	--

#### 4.4.2 Discussions

Based on the observation, all of the respondents were so excited to use the system. According to them, this is their first time observing their own handwriting styles and they never heard about handwriting analysis before. Before they used the system, they were asked to write few sentences so that they can answer the questions based on the handwritings later. They get excited when they started answering the questions in the system. This shows that the users are very interested in using the system to analyze the handwriting.

The second element is the evaluation on their ability to use the system and their reaction towards the user interface. There are 2 out of 7 people do not know how to answer the first few questions before reading the guidelines as they did not know which aspect to focus on. They needed guidance from people around them to see their handwriting styles. However, they start to know how to answer after the first few questions and they commented that the guidelines help them a lot in answering. After using the system for second and third time, they can analyze the handwriting more accurately and in a shorter time. This shows that the difficulty in answering the questions is because they are not used to observing their own handwriting styles. After they used the system more than once, they know how to see their handwriting. TABLE 4.3 shows the time taken for the first time and second time using the system.

Moreover, most of the users did not realize that there is a button that need to be clicked to see their personality traits in the 'Report' page. They commented that there should be

some label in the system that can tell the users to click on it. The system will be modified to suit the needs of future users.

The next element is the accuracy of the personality analysis. There are 6 out of 7 people stated that the result is highly accurate. However, one of the respondent stated that the result is 65% accurate. She commented that the environment affect her handwriting and thus, affect her result slightly. However, the second time she using the system, she stated that it is 90% accurate as she writes in a good environment for the second time. Although all of them has no knowledge in handwriting analysis, they can answer the questions correctly and this gives them an accurate personality result.

Thus, what can be concluded from the User Testing are, the system is very suitable to be used by the interviewers who have no knowledge in handwriting analysis. They may need guidance for the first time using the system. However, they can still answer the questions correctly and this gives them accurate result. The more they use the system, the more they used to observing their handwriting styles. Besides, some user interface screens and sound instruction have to be adjusted according to the user's requirements data collection at the end of the testing.

TABLE 4.3 Summary of Time Taken When Using System

<b>Respondent's Expression when seeing the result</b>	<b>Time taken (Minutes) before using the system</b>	<b>Time taken (Minutes) Repeat 2 times</b>
Respondent 1 (Happy)	20	12
Respondent 2 (Amazed)	20	13
Respondent 3 (Excited)	15	12

Respondent 4 (Excited)	15	8
Respondent 5 (Happy)	15	10
Respondent 6 (Happy)	17	15
Respondent 7 (Happy)	15	12

## **CHAPTER 5**

### **CONCLUSION & RECOMMENDATIONS**

The paper has discussed on the development of prototype of a system, SMART Recruiters' Helper for Human Resource Professionals. This development is based on the handwriting personalities or graphology. It is proven that the handwriting analysis is very useful and accurate in determining one's personalities. Hopefully, this system with the accurate analysis can help as well as support the recruiters in the recruitment process. Besides, the future work of this project will be including more job positions and not only for the recruitment of the lecturers. Moreover, due to the time constraint, the current project has not involve the handwriting scanner and this will be further research of this project. As the current project is proven to give the accurate analysis, the handwriting scanner will be a bonus if it has been successfully developed in the future.

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## APPENDICES

### ONLINE SURVEY FORM



## SMART Recruiters' Helper Mobile App Survey

I am a student from Universiti Teknologi Petronas who is currently working on my Final Year Project named 'SMART Recruiters' Helper'. This project is to introduce a mobile application/system that helps the recruiters to make a more accurate hiring decision. It uses the psychological knowledge to analyze the candidates based on their body language, handwriting and many other aspects.

The purpose of this survey form is to collect your precious feedback on my proposed recruitment application. Thank you.

\*\* IMPORTANT STEPS of the system:

1.0 System asks for the job position applied by Candidate A.  
E.g. Job Position: \_\_\_\_\_

2.0 RECRUITERS key in the job position.  
E.g Job Position: Manager

3.0 System comes out with a set of QUESTIONS based on the job position entered in 2.0  
E.g. One of questions: Q1. Which of the pictures above indicates the handwriting of the candidate A?  
(The questions are promised to be easy to understood and specific.)

4.0 RECRUITERS select the answers for the questions in 3.0.

5.0 System comes out with a report that indicates the candidates' personalities, suitability for job.  
E.g. Right-slanted handwriting indicates that candidate A is open to new ideas, enjoy meeting new people, etc.  
(Different analysis for different job positions.)

\* Required

## Section A

This section is to gather participant's background information.

**Organization/Company Name \***

**Job Position \***

**Years of Experience in Work \***

0 - 3

4 - 6

7 - 9

10 - 12

13 - 15

Other:

## Section B

This section is to learn about the current hiring PROBLEMS.

**Which job position is the position that your company recruits the most? \***

- Junior Executive
- Senior Executive
- Manager
- Secretary
- Technician
- Engineer
- Other:

**What is the Current system or Current ways you used to assist in hiring decision? \***

- Traditional Face-to-face Interviews
- Phone Interview
- Skype Interview
- Automated Personality Test
- Other:

**From 1 to 5, how much would you rate the current system/way used? (To study the system problem.) \***

(1 to 5)

1 2 3 4 5

Not Useful      Very Useful

Out of 5 employees, how many of them perform under expectations? (To study the hiring problems.) \*

(1 to 5)

1 2 3 4 5



## Section C

This section is to collect the participants' feedback on this application.

Do you agree that a wrong hiring decision can cost a large amount of money to the company? \*

Yes

No

To improve the accuracy of the hiring decision, do you agree that psychology plays a significant role? \*

Yes

No

If this proposed system/ application can help you to improve the accuracy of the hiring decision by (1) analyzing the candidates accurately, (2) give a deep analysis of the candidates, do you AGREE that it will be useful for you? \*

1 2 3 4 5

Strongly Disagree      Strongly Agree

If yes, do you AGREE that this system/ application is worth to buy if it can help to improve the accuracy of the hiring decision, as the cost of a wrong hire can be much more than the price?

Yes

No

What would you prefer to use in recruitment process? \*

Mobile Apps

System

Other:

**Submit**

*Never submit passwords through Google Forms.*

Powered by  
 Google Forms

This content is neither created nor endorsed by Google.  
[Report Abuse](#) - [Terms of Service](#) - [Additional Terms](#)

TESTING FORM (HARDCOPY)

## New Product Testing Survey (SMART Recruiters' Helper)

SMART Recruiters' Helper is a system that allows the interviewers to analyze the candidates based on their different handwriting styles.

Occupation

Organization/Institution/Company name

Years of Experience (if applicable)

< 5 years

< 10 years

< 15 years

Other:

Overall, I am satisfied with how easy it is to use this system.

1 2 3 4 5

Strongly disagree      Strongly agree

**I can complete the task in few simple clicks using the system.**

1 2 3 4 5

Strongly disagree      Strongly agree

**I feel comfortable using this system.**

1 2 3 4 5

Strongly disagree      Strongly agree

**It is easy to find the information I need.**

1 2 3 4 5

Strongly disagree      Strongly agree

**It is easy to learn to use this system.**

1 2 3 4 5

Strongly disagree      Strongly agree

**When I enter the wrong input, the system gives error messages that guide me to key in correct inputs.**

1 2 3 4 5

Strongly disagree      Strongly agree

**The graphic (images, colour, etc) of this system is pleasant.**

1 2 3 4 5

Strongly disagree      Strongly agree

**I like using the graphic (images, colour, etc) of this system.**

1 2 3 4 5

Strongly disagree      Strongly agree

**The system has all the functions and capabilities that I expect to have.**

1 2 3 4 5

Strongly disagree      Strongly agree

**This system is useful for our organization/company as it assists the recruitment of lecturers.**

1 2 3 4 5

Strongly disagree      Strongly agree

**Overall, I am satisfied with the system.**

1 2 3 4 5

Strongly disagree      Strongly agree