A STUDY ON THE USAGE OF SMARTPHONE APPLICATIONS TOWARDS JOB PERFORMANCE

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A Study on the Usage of Smartphone Applications towards Job Performance

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DECLARATION

I hereby declare that:

(1) This Research Project is the end result of my own work and that due acknowledgement has been given in the references to all sources of information be they printed, electronic, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) The word count of this research report is 14227.

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DEDICATION

To my family, friends, and loved one

Thank you for all the supports and guidance throughout my MBA journey

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ABSTRACT

Smartphone had become one of the unavoidable device in our daily life. It definitely changes our life and the way we do things, from how people communicate, how to get information to how people spend their free time. Every aspect of our life changes because of smartphone. In this research study, the impact of smartphone towards job performance are examined and discussed. The research findings successfully provide important insight to smartphone user and any other stakeholder on how they are handling this little device in their hand for their own benefit.

This research study was conducted based on extended Technology Acceptance Model (TAM) which incorporate impact on job performance into original TAM. A survey that involved around 300 respondents was conducted within Malaysia worker context. There are 7 variable included in this research which are smartphone self-efficacy, perceived ease of use, perceived usefulness, education, age, attitude towards smartphone application and perceived job performance.

Research findings indicate that smartphone self-efficacy is positively associated with perceived ease of use and perceived usefulness. Perceived ease of use and perceived usefulness are also positively associated with attitude towards smartphone application. Eventually, attitude towards smartphone application is positively associated with perceived job performance. Based on the findings, better understanding on how to utilize smartphone application to improve job performance is obtained. In addition, limitation, recommendation and implication are discussed.

CHAPTER 1

INTRODUCTION

1.0 Introduction

This proposed study targets to study the relationship between the usage of smartphone application and perceived job performance. This study will provide some valuable and key insights into this area specifically in Malaysia. There are prior studies done oversea and the results are mixed with supporters for each side. This study is to focus in Malaysia worker job performance and its relationship with the usage of smartphone. Background of the study and problem statement are presented in this chapter as well as the research questions and research objectives to provide an overview of this study. The hypotheses of the study are discussed and this chapter is finished off with the significance of this study.

1.1 Background of the study

Smartphone has become an inevitable device for almost everyone in Malaysia. The number of smartphone users in Malaysia has skyrocketed from 15.6 million in 2017 to 17.2 million in 2018 and expected to growth further to a massive 20.9 million in 2023 (Satista, 2019). Given the Malaysia population of 32.6 million at the end of 2018 (*Demographic statistic*, 2019), which is more than half of Malaysian possess smartphone. The ratio will be higher when excluding the age group higher than 70 and age group lower than 12 from the whole Malaysia population which are less likely to have a smartphone. Besides that, there is also a survey in 2012 shown that more than 81 percent of employees using smartphone during workhour (Miller-Merrell, 2012). A survey that involve over ten thousand participants in China shows

that around 80% of young employees are heavily dependent on smartphone in performing work tasks (Li & Lin, 2018).

As smartphone are everywhere including at workplace, people have significant increasing interest on how does the smartphone usage affect the productivity or in another term for most employee, the job performance. Many people are having bad perception of smartphone usage at workplace that it will distract the worker from fully focus to their work and reduce job performance (Leynes, Flynn, & Mok, 2018). However, there are studies reported to show that smartphone actually benefit the employee in term of improving job performance (Böhmer, Saponas, & Teevan, 2013).

Internet, smartphone and e-mail has been voted as the top 3 greatest innovation of the last three decade (Korkki, 2009). These 3 innovations are actually correlated to each other and smartphone acts as a medium to access internet and e-mail. This shown how important is a smartphone for people living in the current world. Smartphone itself is a double-edged sword. It enable us to connect people around the world conveniently so we are able to continue our work whenever and wherever we want (White, 2010). At the same time, it also result in more stress because people are having pressure that their boss are expecting them to reply the queries anywhere and anytime (Orlikowski, 2007). Furthermore, the entertainment function of smartphone is very distracting and affecting the performance but at the same time also help providing a relaxing time in the middle of overwhelmed workload.

As mentioned above, smartphones can provide many benefits but also having disadvantages to users at the same time. This research recognizes the advantages and disadvantages of smartphone. It is crucial to understand on how can we deeply utilise smartphone to improve our job performance. Henceforth, the aim of this study is to study and identify the relationship between smartphone application usage and job performance.

1.2 Problem statement

Prior researches shows mixed findings regards to the relationship between smartphone application usage and job performance. For example, Duke (2017) conduct a study in German has shown smartphone addiction causes negative effects on productivity in work place and daily lives. Meanwhile, there is also study and article support the opinion that smartphone actually positively affecting the productivity (Bertschek & Niebel, 2015; Li & Lin, 2018).

There are certain applications, functions and features of a smartphone that can be used to improve the productivity. At the same time, there are more mobile apps with entertainment purpose that serve to entertain people during their free time but end ups affecting the productivity due to its addicting nature. Here comes the question proposed where can certain apps be limited during workhour to ensure employees focus on their tasks. Apple is aware of this and introduced a new feature "Screentime" in 2018. Users can view their screen on time for each apps, limit the apps usage and manage screen time for iPhone("iOS 12," 2018).

Smartphone User Persona Report (2015) stated that Malaysia smartphone users spend an average of 187 minutes per day on their phones and 63 percent of the smartphone users are within the age group of 18 to 36 years old. This age group is also the main component of Malaysia workforce.

Research on smartphone application usage and job performance in Malaysia is not receiving much attention and interest from related parties despite its importance. By identifying the relationship between smartphone application usage and job performance, this research offers a modest finding in order to draw more valuable opinion and interest towards this area.

1.3 Research objectives

The objectives of this research are identified to address the problem statement above.

1.3.1 General Objective

This research targets to study and examine the determinants of effect smartphone application usage towards job performance and access the Malaysia employees' attitude towards smartphone application for working purpose by using the extended Technology Acceptance Model (TAM) adapted from (Chung, Lee, & Kim, 2014; Isaac, Abdullah, Ramayah, & Mutahar, 2017).

1.3.2 Specific Objectives

Based on the general objectives above, the following specific objectives are derived.

1. To investigate the relationship between smartphone self-efficacy and perceived ease of use.
2. To investigate the relationship between smartphone self-efficacy and perceived usefulness.
3. To investigate the relationship between perceived ease of use and attitude towards smartphone application.
4. To investigate the relationship between perceived usefulness and attitude towards smartphone application.
5. To investigate the relationship between education and attitude towards smartphone application.
6. To investigate the relationship between age and attitude towards smartphone application.
7. To investigate the relationship between attitude towards smartphone application and perceived job performance.

1.4 Research questions

The following questions are targeted to be addressed in this research:

1. Does smartphone self-efficacy influence perceived ease of use?
2. Does smartphone self-efficacy influence perceived usefulness?
3. Does perceived ease of use influence attitude towards smartphone application?

4. Does perceived usefulness influence attitude towards smartphone application?
5. Does education influence attitude towards smartphone application?
6. Does age influence attitude towards smartphone application?
7. Does attitude towards smartphone application influence perceived job performance?

1.5 Hypotheses of the study

Prior studies based on extended technology acceptance model (TAM) shows that self-efficacy is positively associated with perceived ease of use and perceived usefulness (Isaac et al., 2017). Thus, it is hypothesised in this research that:

H1: There is a significant positive relationship between smartphone self-efficacy and perceived ease of use.

H2: There is a significant positive relationship between smartphone self-efficacy and perceived usefulness.

Based on findings from earlier TAM studies (Chung et al., 2014; Jan, de Jager, Ameziane, & Sultan, 2019; López-Nicolás, Molina-Castillo, & Bouwman, 2008; Mallat, Rossi, Tuunainen, & Öörni, 2009), the researcher proposed that perceived ease of use and perceived usefulness have positive impact and able to explain on the attitude towards smartphone application.

H3: There is a significant positive relationship between perceived ease of use and attitude towards smartphone application.

H4: There is a significant positive relationship between perceived usefulness and attitude towards smartphone application.

Through findings from previous studies, there is a positive relationship between education and job performance (Hidayat & Budiatma, 2018; Ng & Feldman, 2009). In addition, mixed results was shown in the relationship between age and job performance (Ng & Feldman, 2008). Therefore, the following hypotheses are proposed.

H5: There is a significant positive relationship between education and attitude towards smartphone application.

H6: There is a significant relationship between age and attitude towards smartphone application.

Lastly, performance impact of new technology usage is further included to extend initial TAM model. The dependent variable switch from acceptance and usage of new technology to performance impact from the use of new technology. Based on extended TAM model developed by Chung et al. (2014), perceived job performance gain from new technology can be identified by attitude towards new technology. The following hypothesis is proposed.

H7: There is a significant positive relationship between attitude towards smartphone application and perceived job performance.

1.6 Significance of the study

This research is significant to smartphone users, managers and bridging the gap of organization behaviour theory in the context of Malaysia. The explosive growing number of smartphone users worldwide has become phenomenal around the world. It is important for us to understand the effect of smartphone usage on our daily life especially in our working environment.

Smartphone is very useful in our daily life including providing us the ability to connecting with others anywhere and anytime, being used as entertainment tools for people to relax, record audio or video for meeting, reminders tools and etc.(Cochrane & Bateman, 2010). There are downsides of smartphone, for example people are addicted to it to an extend that disrupt their daily life. Productivity can be negatively affected because the smartphone is extremely portable and carried around everywhere. Any notification from smartphone can be very distracting thus affecting the productivity and job performance (Leynes et al., 2018).

Therefore, by examining the relationship between smartphone usage and job performance, necessary arrangement can be done by managers to utilize smartphone usage in workplace. For example, instead of total isolation of smartphone and result in lack of communication between outside world, managers can train their staffs properly in using smartphone in a workplace and to make use of smartphone for better job performance. “Technology is neutral; it depends on how it's used.” by Rick Smolan implied that there is no good or bad to technology as a tools. In the case of smartphone, this is also applicable.

To the best of my knowledge, there is no prior research done to examine the relationship between usage of smartphone application and job performance in Malaysia. This research will provide valuable and important insight to workplace managers, human resource team and other stakeholders who have significant interest in this area.

1.7 Conclusion

In conclusion, this chapter provided an overview of this research. Background of the study, research objectives, research question, hypotheses of the study and significance of the study were discussed in this chapter.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

This chapter reviews the scholarly literature regarding job performance, smartphone application, smartphone self-efficacy and extended technology acceptance model (TAM). The theoretical framework is proposed at the end of this chapter.

2.1 Productivity and Job Performance

2.1.1 Three main definition of productivity

Productivity or job performance has always been one of the popular research and discussed topic in any industry. It is one of the most important if not the only one factor in directly impacting a company success or failure. One of the biggest problems of the perception of productivity is "the assumption that everyone shares a common definition of the term productivity" (Kearney, 1999). The term productivity actually represents different meaning to different people in different industry. In general, the definition can be group under three main categories.

The first one is the ratio of outputs to inputs. This means given the same amount of input, the increase of output will definitely represent the increase in productivity. Therefore, this emphasise the importance of productivity because it can simply transform to higher profit with same amount of cost. In a workplace, the loss of time when employees are using their smartphone for non-work related purpose directly

lower the productivity because the decrease of output (tasks completed/ quality of work) with the same amount of input (time consumed) (Beaton et al., 2009).
The second productivity definition taking in both efficiency and effectiveness in the measurement of productivity. The efficiency in this definition is same as the one in first definition(outputs/inputs). The effectiveness means the ratio of outputs to goals. For example, the actual number of products produce divided by the targeted number of products. The combination of these 2 aspect (efficiency and effectiveness) provide a more comprehensive view to measure productivity but subjectively. The third productivity definition is a general statement which acknowledge anything that can improve the organisation operation and outcome as productivity and it involves much more aspect than just efficiency and effectiveness (Pritchard, 1995).

Out of these 3 main productivity definitions, this research will adopt the third definition. Due to the focus group of study is Malaysia worker without any specific industry or nature of job, their productivity cannot be defined under simple output/input (1st definition) or outputs to goals (2nd definition). Their productivity should take quality of work, attitude, time consumed, innovation, creativity, self-development and other outcome related factors in determining the productivity.

2.1.2 Professional's view of productivity

On the other hand, productivity can be defining by looking it from different point of view such as economist's view, engineer's view, accountant's view and manager's view (Turtle, 1981). The economist's view is same as the first definition, which defined the productivity as the ratio of outputs to inputs. The inputs of an organization can be convert into outputs to be provided in the market. The ratio of outputs to inputs can be further defined volume of outputs as a function of labour, capital, raw material and level of productive efficiency. These 4 parameters are the common factors of production inputs (Kendrick, 1977).

The engineer's view is different from economist's view. The major different is economists usually view the productivity from the perspective of company, industry or economic as a whole. However, engineer more emphasis on the productivity from the perspective of an individual, a process or a team. The is caused by distinct

between the nature of work of both sides. The main focus of this view is the efficiency of the work which leads to 3 definitions of productivity (Norman & Bahiri, 1972).

1. $\frac{Useful\ output}{Input}$
2. $\frac{Effecitive\ input}{Actual\ input}$
3. $\frac{Actual\ output}{Potential\ output}$

Whilst for accountant's view, their main concern is the financial performance and financial ratios are the main tools used to measure the financial performance. Financial ratios are mostly derived based on the concept of productivity. For example, one of the common financial ratios which is the profit over capital employed. This is a ratio derived from outputs over inputs. The problem lies with financial ratios is that the profit not only depends on the inputs (capital in the case), the sales market condition also plays an important role in affecting the profit. Therefore, financial ratios cannot be directly interpret as productivity as a whole but for accountant's view which their focus is on the financial performance, financial ratios can simply represent productivity (Norman & Bahiri, 1972).

Based on survey conducted by several authors on 1975, United Stated managers were having different opinion on the definition of productivity (Katzell, Yankelovich, Fein, Ornati, & Nash, 1975). A set of possible meaning of productivity was sent to the managers for them to choose the one should include in the productivity definition. The survey result shows over 95% of managers agree that quality should be taken in consideration as important as quantity. In contrast, only 22 percent of the surveyed managers agree that ratio of outputs to inputs by industry or economy level should be included in definition of productivity. Other factors such as output per man-hour, overall efficiency, disruption, rate of absenteeism, customer satisfaction and employee loyalty are also included in the survey.

2.1.3 Knowledge Worker Productivity

To specify, the productivity to be studied in this research, the manager's view and the third definition of productivity will be the main focus because its more applicable and general to be used in the whole Malaysia worker context. Compare to performance of worker that can easily be quantify such as sales person. The hardest productivity to be quantified will be the knowledge work productivity. The biggest challenge in knowledge work productivity is the intangible of its inputs and outputs which significant enhancement in difficulty of measurement. There are several attempts by researcher tried to solve this issue and Koopmans et al. (2011) suggests that productivity needs to split into smaller portions for investigation. A performance framework was developed by Koopmans et al. (2011) and this framework evaluate employee performance from four dimensions which are contextual performance, counterproductive work behaviour, task performance and adaptive performance. These four dimensions basically summarize all the factors in knowledge work productivity but there is no standardization of knowledge work productivity, it still depends on the job role of the employee (Palvalin, 2019).

2.1.4 Productivity and Job Performance

As shown in above section, there isn't a correctly definition for productivity, and the same goes to job performance. Both terms are not well-defined (Murphy, 1990). There are some people who said that productivity and job performance are 2 different things. There are views that productivity is the efficiency measurement but performance is the concept of how well the things was done or the objective was accomplished ("Don't," 2011; Perrin, 2016). However, most research didn't really distinguish between job performance and productivity and treat them as the same measurement and having their own understanding on the meaning of productivity and job performance (Hunter & Schmidt, 1983; Kenny, 2019; Viswesvaran & Ones, 2000). In this research, the research decided to narrow down the scope to prevent any possible misinterpretation on these 2 terms. It was discovered that most of the time productivity serve as more general term whereas job performance usually refers to and individual or person. Therefore, it was

decided to in this research project context. Productivity that used and refer to individual or person is defined as the same as job performance.

2.1.4 Measurement of Job Performance

Measurement of job performance has always been area of interest for many researchers, yet there are many challenges the path to job performance measurement. In the situation where the job performance of employee is measured by the number of task completed or the time spend by the employee working, the quality of the outputs is not included in job performance measurement and most of the time the quality is the important parameter, instead of numerical result especially in knowledge industry such as scientists, academic, writers, engineers, etc. (Oxenburgh & Marlow, 2005). For example, the brilliant idea of an employee that generate generous profit or the quality of a published article are both very difficult in measuring its job performance or productivity. This reflects the limitation on the productivity definition and measurement. Although there are efforts made to quantify quality, those methods were limited and only applicable to designated works and very difficult to use (Blumenstock, 2008).

To overcome the difficulty stated above, people find workaround to estimate the performance of workplace level by measuring the perceived job performance. This is similar to the concept of first definition by including studies proven productivity affecting variables to estimate the work quality. Variables such as number of words, amount of time spent, amount of time saved, days absent from work, satisfaction of worker, overhead consumed and more indicators are used to estimate quality and measure the perceived job performance. Based on this concept, most organizations formulate their own key performance indicator based on the above variables to address the missing of quality assessment in performance measurement (Been & Voordt, 2016).

In 2004, 21 knowledge work performance measurement methodologies was discussed by Ramírez and Nembhard (2004). The methodologies discussed address the challenge that performance is unable to measure directly but parts that contribute to employee job performance can be measured (Drucker, 1999).

Methodologies discussed such as “completion of goals”, “percentage of time spent in value-added activities”, “Peer evaluation” and etcetera can be refer by management of organization to adopt related methodology for employee performance or productivity evaluation.

In this research, the targeted observation is on the worker job performance. The targeted research population involve many industry and there is no standard measurement of job performance across industry. Therefore, many organizations are usually having their own sets of key performance indicator for performance appraisal which is designed based on the methodology as mentioned in earlier paragraph to reflect productivity by some means. However, given the constrain on the high level of confidential on employee data, it is highly challenging and very unlikely to obtain employee performance rating for a large sample size without the support from organisations. In addition, there are some researcher supports the point that self-assessment of job performance is better than none (Barry, 2008; Clements-Croome, 2006; Oseland, 1999). Taking the stated reason into consideration, this research will measure job performance from a self-reported perspective.

2.2 Smartphone and Productivity Apps

2.2.1 Smartphone

The evolution of smartphone can categorise into three generations. The first generation start with the first mobile phone invented by Motorola in 1980s with the only function to call and talk to the other side of mobile phone. The mobile network at that time is only capable of SMS and no data communication. The phones are very expensive and its heavy and bulky in which only a few people able to own it. In the twenty century, the mobile phones reach its second generation, most of the people are able to afford mobile phone(Miyashita, 2012). The mobile phones now are packed with the function of basic entertainment such as simple game and slow internet access for email communication. The example of the phone of this era are Sony Ericsson and BlackBerry.

In 2007, Apple launch iPhone and the era of smartphone begins. The mobile phones have the capability to do so much things where people give it a term “Smartphone”.

Smartphone together with high speed network allows user to download software from network. Software which helps enhance the functionality and provide extra feature to smartphone began to goes into people live. Application, or Apps are the term to describe the software used in smartphone. As at end of 2018, there are around 1.9 million mobile apps available in App store for iPhone user to download("Number of available apps," 2019).

2.2.2 Productivity Apps

There are various types of apps available for smartphone. While most of the smartphones apps are developed for communication and social networking (Facebook, WhatsApp, Instagram) and Entertainment (YouTube, Games, Music). There are also apps designed for other purpose such as reading, education, finance, productivity and utilities. Apple prepared a list of apps categories and required the apps developer to specific the category of apps during the development of the apps("iPhone development 101," 2018).

Productivity apps being one of the popular category in apps store, are being given the purpose to helps improve user productivity. They were developed to support or assist their user in completing their task or even a goal. Some good classic example of productivity apps is email apps which allows user to access work email without the needs to switch on their laptop. This minimize the hassle to find a table to place laptop for checking email and is expected to boost the productivity of employees as they are able to respond immediately. There are also productivity apps that helps users to plan their to-do list, taking note, schedule meeting and so on(Sweeney & Moore, 2012). Smartphone apps work greats as a reminder tool because people carry it anywhere and won't miss any notification.

However, it's too strict to identify or define productivity apps solely based on the categories decide by the apps developer. The term productivity apps can be interpreted as any apps that can improve the productivity of any individual. Besides classic productivity apps that was developed with the only straightforward goal to improve productivity, social and messaging apps such as WhatsApp, LINE, WeChat are having the function to respond immediately to any work related query

which indirectly assist in daily task. Thus, productivity apps should conclude as apps that are able to help improve and assist in daily work routine.

2.2.2.1 Functional Apps

One of the biggest different between smartphone apps and computer software is the portability of smartphone where apps can be access anytime and anywhere with your smartphone. It is also faster to access using mobile phone where the apps can launch within seconds when compare to laptop which requires time to boot (Gröger, Silcher, Westkämper, & Mitschang, 2013). This feature of smartphone provide idea for computer software provider.

Many large computer software providers such as Microsoft, Google, Adobe with a huge user based in computer environment have their own mobile version software. Compare with full feature version of their computer software, mobile version usually only allows basic feature but still capable to complete most of the executive task. For example, you are unable to use VBA function in a smartphone Excel Apps, but still able to create a listing with simple formula on a smartphone. With basic function of the apps and cloud computing, it allows seamless connection and transition between devices (Patent No. U.S. Patent No. 8,880,051, 2014). Employees able to continue their work from smartphone when they need to leave workplace for meeting or when having emergency. Study conducted by Oulasvirta and Sumari (2007) discussed the pros and cons of working across multiple devices (Laptop, Desktop PC and smartphone). The benefits such as smartphone as fall back devices, easier multitasking and manipulation and display suitability comes with the cost of security, effort to set up devices and management of tasks between all devices.

Prior study on smartphone and PC usage of information worker prefer to continue connect to their work mail after working hour to be in control of their work status (Karlson, Meyers, Jacobs, Johns, & Kane, 2009). The findings from same study also mentioned that the interviewed participants wish the smartphone to be as powerful as their working PC where they able to complete more things on their smartphone. The connectivity of smartphone is what allow employee to continue monitoring their work status after working hour without having to be physically

present at the office. It's especially useful when the work is to monitor and ensure the workflow run successfully without interruption (Dery, Kolb, & Maccormick, 2014).

2.2.2.2 "Getting Things Done" Apps

Another popular group of productivity apps other than classic working software mentioned above (Excel, Adobe, Google doc, Google drive) is "Getting Things Done" (GTD) apps. "Getting Things Done" apps can be further classify under time management apps and task management apps. It doesn't directly allow user to do their task from smartphone, but acts as a robot supervisor. Besides remind outstanding task, create to-do list, smartphone usage restriction, a well-designed GTD app should also motivate an employee and help them to focus towards their goals.

Time management apps helps improve productivity via several ways ranging from limit smartphone time usage to rewarding user based on their achievement. The app "Forest" is one of the leading apps in time management. With this app, user can set a timer to restrict smartphone usage while planting virtual tree in the app. If the user uses the phone before the timer end, the tree will end up dying. The best part of the app is that for every tree plant in the app, Forest team will also partner with real-tree planning organization to plant real trees on earth("Forest", 2019). This sense of accomplishment helps motivate user to stick to the timer and achieve self-control.

Task management apps does what it names means. These apps help users to track their work cycles by different frequencies such as minute, hour or day. It also helps users to rank the urgency of task so that users can focus on 1 or 2 task at a time. "Omnifocus" is one of the top task management apps available with its objective to help users accomplish more every day ("Omnifocus," 2019). The final objective of task management apps is to identify and suggest best working pattern based on data collection from task completion status. For instance, there will be periods during day which some are more productive than others. The apps help identify the most productive timeframe for user so that they can allocate a period of uninterrupted time to complete important task (Gregg, 2015).

2.3 Extended Technology Acceptance Model

Technology Acceptance Model (TAM) is a well-established model which was commonly used to examine user acceptance towards new technology. Technology Acceptance Model was proposed by Davis, (1989). It is one of the most popular extensions of Theory of Reasoned Action (TRA) developed by Fishbein and Ajzen (1977). TAM started with external variable and then follow by perceived ease of use and perceived usefulness which was proposed by Davis (1989). Perceived ease of use represents how a person believe the technology is easy and user friendly. Perceived usefulness means how a person believe the technology is useful in helpings their task or what they want to complete. After that, the model link to attitude towards using and behaviour intention to use, and it ends with the actual system usage which is the targeted model objective.

In 2014, Chung conducted a study to investigate the job performance and mobile enterprise system. He found that there was not much effort done towards studying the impact of new technology usage towards job performance. Most of the study only examine the impact of new technology until system usage and it's probably because most technology especially mobile service are mainly mean for consumer (Chung et al., 2014). Hence, he proposed an extension towards original TAM and named it extended TAM to further applied in the study. Several antecedents are suggested and most importantly job performance is included in the extended TAM after attitude towards using and behaviour intention.

In 2017, the extended TAM was adapted by Isaac et al. (2017) to conduct a study on internet usage and perceived job performance in Yemen. In addition, Isaac added a new external variable into his study which is internet self-efficacy. Both studies mentioned above proved the usability of extended TAM gave us the idea on our theoretical framework. Eventually this research's theoretical framework was adapted from extended TAM and use smartphone self-efficacy as external variable to investigate perceived job performance.

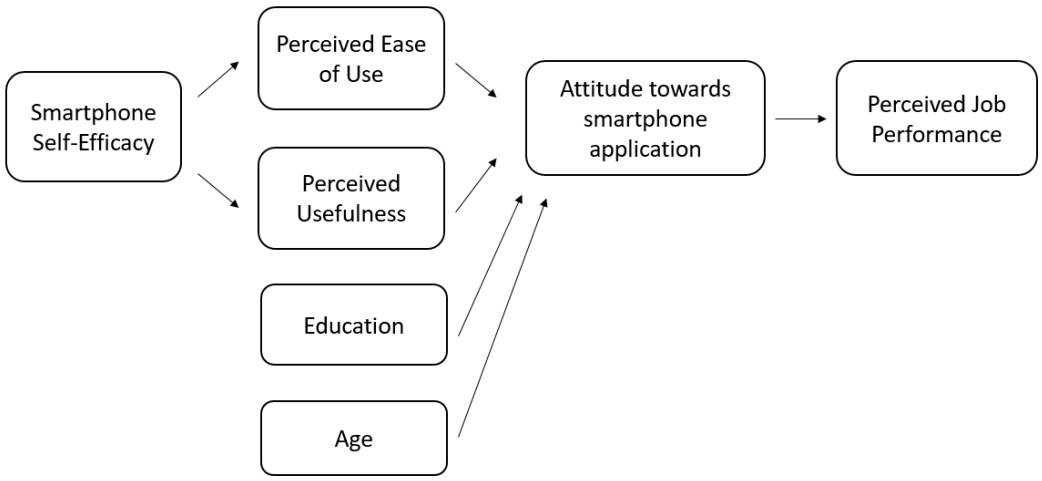
2.4 Smartphone Self-Efficacy

Self-efficacy was used to incorporate in TAM and play an important role in previous studies regarding technology (Ahmad, Madarsha, Zainuddin, Ismail, & Nordin, 2010; Joo, Park, & Lim, 2018; Sánchez-Prieto, Olmos-Migueláñez, & García-Peñalvo, 2017). Furthermore, it was also used in the context of smartphone (Roy, 2017). Self-efficacy is the individual belief or perception on their capability to achieve something or to accomplish a target (Bong & Clark, 1999). Whereas in the context of smartphone, smartphone self-efficacy specifically means the individual belief on their ability to perform activities as per what they expected using smartphone. Individual with better smartphone self-efficacy should have higher level of perceived ease of use, perceived usefulness and attitude towards smartphone application because they believe they are able to overcome any issue when using smartphone. Previous studies shows that self-efficacy have significant impact on perceived ease of use and perceived usefulness (Abdullah, Ward, & Ahmed, 2016; Fathema, Shannon, & Ross, 2015; Isaac et al., 2017).

2.5 Theoretical Framework

Based on theoretical model discussed above, theoretical framework of this study is presented below. It illustrates the relationship between independent variable and dependent variables. Theoretical framework is illustrated in figure 2.1 below.

Figure 2.1: Theoretical framework



CHAPTER 3

RESEARCH METHODOLOGY

3.0 Introduction

In Chapter 1 and Chapter 2, hypotheses and conceptual framework are highlighted. In this chapter, research methodology is discussed in detail. Start with research design, follow by data collection and sampling method. This chapter will end with research instrument.

3.1 Research Design

Burns, Veeck and Bush (2016) stated that research design is a blueprint that consists of all the methodology and procedures from sampling, data collection to data analysis. It acts as a systematic guideline to ensure the researcher is on the right path along research progress.

Generally, exploratory and conclusive research design are the 2 most adopted research design(Malhotra, Birks, & Wills, 2012). As the name suggest, exploratory research design explore the research question and does not aim to provide conclusion or solution to the problem. Problem study is the main objective of exploratory research and typically used for un-researched problem. Meanwhile, conclusive research aims to provide findings, conclusion and solution to research problem. Common conclusive examples are the research that study the relationship between variables and perform hypothesis testing. In order to draw conclusion, conclusive research required much larger sample size compared to exploratory research. In this study, conclusive research was adapted.

Furthermore, causal research and descriptive research are adopted in this study. The population characteristics such as demographic are examined using descriptive research to gain insight and overview on the target population. Findings from descriptive research can provide explanation in the situation which some of the demographic might affect the result of this research(Burns et al., 2016). Causal research is the main component of this research. Causal research examine the relationship in which how does the changes of one variable affect the outcome of another variable (Fraenkel, Wallen, & Hyun, 2011). In this case, the interest is on the smartphone application usage and job performance.

For this study, mixed method research will be used. Mixed method research use both qualitative research and quantitative research in the study. While quantitative and qualitative research could weighted differently for different research(Saunders, Lewis, & Thornhill, 2012), this particular study use quantitative and qualitative research equally. Single source data collection technique is adopted in this research. Questionnaire survey is developed and distributed to target population for data collection. This study aims to investigate relationship between smartphone application usage and job performance as at a snapshot of time horizon. Due to time constraint and nature of this study, this research is indeed a cross-sectional study.

3.2 Data Collection

Data collection is a crucial step in any research and it can result in the failure of research project if wrongly done. Therefore, data collection need to be performed correctly with appropriate method to ensure the validity of result after this step. This research use primary data with data collection via survey questionnaire.

Primary data is the data collected by the researcher as the first-hand sources. Researcher collect the data exclusively to address the research problem(Malhotra et al., 2012). Origin from researcher, primary data is raw and trustworthy to present unaltered findings which are reliable and meaningful.

Survey questionnaire is one of most popular data collection method used because of its efficiency. It is capable to capture a large sample of responses within short amount of time and effort because the survey questionnaire are the same for every respondents(Saunders et al., 2012). However, Bell (2014) stated that good questionnaire is difficult to create in which questionnaire should be designed to collect exactly necessary data to address hypothesis, research questions and objectives.

In addition, self-administrated questionnaire method was adopted. This method requires respondents to answer questionnaire without the present of the researcher or any facilitator. Advantages of self-administrated questionnaire include lower cost, better geographic coverage, larger sample size and anonymity(Bourque & Fielder, 2003). The questionnaire was designed and upload to google form for distribution using internet. Detail sampling techniques will be discussed in next section in this chapter. The target duration of data collection was from 3th October to 23th November.

3.3 Data Sampling

3.3.1 Target Population

A good start for data sampling design is determined by selection of target population. Target population is the group of individuals which the research wants to study, make inferences and discover findings through the research (Lavrakas, 2008). The research objective is to investigate the how does smartphone application usage affect working adults job performance within Malaysia context. The target population is all Malaysian worker that use smartphone to assist in their work directly or indirectly.

3.3.2 Sampling Technique

This research selects non-probability sampling to sampling from the total target population. Non-probability sampling is a group of sampling techniques in which the researcher selects the samples subjectively instead of randomly selection (Zikmund, Babin, Carr, & Griffin, 2010). Although non-probability sampling lack

generalizability and the result findings not always correct when try to apply to the population (Showkat & Parveen, 2017), this sampling method is much practical compare to probability sampling in this specific research study. Moreover, it's impossible to obtain a sampling frame for the target population due to the large number of total target population.

Among all the methods of non-probability sampling, convenience sampling has characteristic as per its name suggest, convenience. The selected samples are easily accessed by the researcher at the time of conducting research and they are willing to contribute for the research. Besides that, purposive sampling allows researcher to select participants which are more readily fit (Etikan, Musa, & Alkassim, 2016) such as working adults in this research. Together with snowball sampling which utilise the respondent's network to locate potential respondent, these techniques simplify and accelerate the process of sampling. The advantages of sampling methods mentioned above such as convenient, effective and inexpensive makes them perfect fits for this resources limited research.

3.3.3 Sample Size

In order to prevent false results, many statistic research prove that data need to be normally distributed (Saunders et al., 2012). Based on central limit theorem, if the population is not normally distributed, larger sample size will result in a distribution which is similar to normal distribution. Stutely (2003) stated that sample size should be at least 30 to conduct statistical analysis. Krejcie and Morgan (1970) proved that maximum sample size should be slight more than 380 because the required sample size increase at diminishing rate as the population increases.

Larger sample size usually leads to lower variances in applying the findings to the population. However, the resources required (time and money) increased positively with the sample size. Eventually it comes down to the researcher's decision based on confidence of data, acceptance level of error margin, types of analysis and population size (Saunders et al., 2012). After taken above concerns into consideration, the researcher had settled down on a sample size of around 300.

3.4 Research Instrument

3.4.1 Questionnaire Design

There are several different definitions of questionnaire depend on its usage(Oppenheim, 2000). Saunders et al (2012) use the term 'questionnaire' to represent all data collection method that involve participant answering a same fixed set of question.

For this research, the questionnaire was prepared in English because it's a universal language and widely adopted in Malaysia. Moreover, Malaysia workers are expected to use English in their daily work routine. The questionnaire (Appendix A) consists of seven sections, which are Section A (Demographic Profile), Section B (Smartphone Self-Efficacy), Section C (Perceived Usefulness), Section D (Perceived Ease of Use), Section E (Attitude towards smartphone application), Section F (Perceived Job Performance).

Demographic profile of respondents was collected in Section A. Total of 6 questions were asked in this section. Information collected included gender, age, education level, working industry, job role. Besides that, question 6 in section A is a filter question designed to filter out respondents who didn't use smartphone to assist in their work both directly or indirectly. Descriptive analysis and data cleaning were performed based on Section A results.

In Section B, smartphone self-efficacy was the targeted collected data. Questions 8 to 11 were designed to collect data on respondent's beliefs on their ability to utilise smartphone. Section C contained 4 questions start from question 12 to 15, designed to collect information on respondent's perceived usefulness on smartphone application while Section D question 16 to 18 asked respondent on the perceived ease of use. Section E collected data regarding attitude towards smartphone application from question 19 to 22. Lastly, perceived job performance gain were assessed in section F from question 23 to 25.

From section B to section F, all questioned were designed as close-ended question with 5-point Likert scale. Closed question were used because it's easier to

administer and process than opened question. It can be easier code into data analysis tools for faster data analysis (Brace, 2018). Besides that, respondents also able to select their answer faster when there are options available. 5-point Likert scale range from strongly disagree to strongly agree is used to assess their opinion and though on the item. Reverse coding also included in this questionnaire to encourage the respondent to properly read through all the question and answer them with their intuitive respond. This served the purpose to filter out invalid respondent (Józsa & Morgan, 2017).

3.4.2 Pilot Test

Questionnaire should undergo pilot test before distributed to your target respondent. Pilot test of questionnaire helps to refine the questionnaire so that the respondents understand the question and able to provide valid respond. Besides that, pilot test data can be used to perform preliminary analyses such as reliability test(Saunders et al., 2012). This ensure the questionnaire is precisely prepared and sufficient to tackle the hypotheses.

Depend on the nature of research, sample size of pilot test should range from 10 to 40(Hertzog, 2008). Some researchers claim that sample size of pilot test should be ten percent of the projected sample size(Connelly, 2008; Treece & Treece Jr, 1977). Hence, pilot test of this research is conducted with 30 adult workers in September 2019. Feedbacks from pilot test are studied thoroughly and amendment are done accordingly in order to produce better questionnaire. Changes made to the questionnaire is to change the original yes-no question in attitude towards smartphone application construct to 5-points Likert scale question. This helps to standardize the questionnaire for much smoother data processing and analysis.

3.5 Construct Measurement

In this research, there are 6 independent variables and 1 dependent variable. Smartphone self-efficacy, perceived ease of use, perceived usefulness, education, age, attitude towards smartphone application usage are independent variables. The

dependent variable is perceived job performance. The construct measurements used in this research were sourced and adapted from prior studies.

Perceived job performance is the dependent variable. 3 items used to measure perceived job performance were adapted from (Chung et al., 2014). Table 3.1 lists out the items for this construct which are: (1) I successfully use smartphone application to assist my job, (2) I am satisfied with the effect of using smartphone application on my job performance, (3) Using smartphone application helps reduce the time of performing the job tasks. Reliability test conducted on this scale shows results Cronbach's alpha equal to 0.84.

Table 3.1: Perceived Job Performance and Measurement Items

Construct	**Measurement Items**	**Cronbach's Alpha**	**Sources**
Perceived job performance	1. I successfully use smartphone application to assist my job. 2. I am satisfied with the effect of using smartphone application on my job performance. 3. Using smartphone application helps reduce the time of performing the job tasks.	0.84	(Chung et al., 2014)

Table 3.2 presents the 4 items in the construct of smartphone self-efficacy. The 4 items are (1) I am able to figure out how to use the interface of a smartphone on my own, (2) I am able to figure out how to download smartphone applications on my own, (3) I am able to figure out how to use apps on my own, (4) I am able to figure out how to use the different functions provided by smartphones on my own. The above items are adapted from (Isaac et al., 2017). Data analysis shows Cronbach alpha of 0.81 for this construct.

Table 3.2: Smartphone Self-Efficacy and Measurement Items

Construct	Measurement Items	Cronbach's Alpha	Sources
Smartphone self-efficacy	1. I am able to figure out how to use the interface of a smartphone on my own. 2. I am able to figure out how to download smartphone applications on my own. 3. I am able to figure out how to use apps on my own. 4. I am able to figure out how to use the different functions provided by smartphones on my own.	0.81	(Isaac et al., 2017)

Table 3.3 presents the 3 items in the construct for variable perceived ease of use. The 3 items are (1) It is easy to use smartphone application to assist in my daily work, (2) It is easy to get smartphone application to do what I want it to do, (3) It is convenient to access smartphone application for working purpose. The above items are adapted from (Chung et al., 2014). The reliability test on this construct results in Cronbach alpha of 0.81.

Table 3.3: Perceived Ease of Use and Measurement Items

Construct	Measurement Items	Cronbach's Alpha	Sources
Perceived ease of use	1. It is easy to use smartphone application to assist in my daily work. 2. It is easy to get smartphone application to do what I want it to do. 3. It is convenient to access smartphone application for working purpose.	0.81	(Chung et al., 2014)

Table 3.4 shows the 4 measurement items in the construct for variable perceived usefulness. The 4 items are (1) Using smartphone application enable me to accomplish tasks more quickly, (2) Using smartphone application enhances my task effectiveness, (3) Using smartphone application makes it easier to do my task, (4) Smartphone application is useful in performing my task. The above items are adapted from (Chung et al., 2014). The reliability test on this construct results in Cronbach alpha of 0.89.

Table 3.4: Perceived Usefulness and Measurement Items

Construct	**Measurement Items**	**Cronbach's Alpha**	**Sources**
Perceived usefulness	1. Using smartphone application enable me to accomplish tasks more quickly. 2. Using smartphone application enhances my task effectiveness. 3. Using smartphone application makes it easier to do my task. 4. Smartphone application is useful in performing my task.	0.89	(Chung et al., 2014)

Table 3.5 indicates the 4 measurement items in the construct for variable attitude towards smartphone application. The 4 items are (1) I am satisfied with my overall experience of smartphone application use, (2) My overall experience of smartphone application is pleased, (3) Most of the time, I am having frustrating experience while using smartphone application, (4) My overall experience while using smartphone application is terrible. The above items are adapted from (Chung et al., 2014). Item 3 and 4 are reversed code to filter out invalid respondent. The reliability test on this construct results in Cronbach alpha of 9.5.

Table 3.5: Attitude Towards Smartphone Application and Measurement Items

Construct	Measurement Items	Cronbach's Alpha	Sources
Attitude towards smartphone application	1. I am satisfied with my overall experience of smartphone application use. 2. My overall experience of smartphone application is pleased. 3. Most of the time, I am having frustrating experience while using smartphone application. 4. My overall experience while using smartphone application is terrible.		(Chung et al., 2014)

3.6 Data Preparation

Raw data collected from questionnaire unable to be used directly for data analysis. Data had been through several step of processing before researcher able to use statistical software to analyse it. Data preparation included data profiling, data cleansing and data transformation to a readable format for the statistical tools (Abdallah, Du, & Webb, 2017). Data preparation allows improve the accuracy of data and convert raw data to structure form that are suitable for analysis (Cooper & Schindler, 2014).

3.6.1 Data Profiling

The first step in data preparation is to review the collected respond and assess them for the suitability of the data. The data structure and all information regarding the data were investigated during this step (Abdallah et al., 2017). After data profiling, researcher had better understand with the data on hands. With the information obtained and overall data understanding, the researcher able to determine and select appropriate data analysis to be performed next step for better findings.

3.6.2 Data Cleansing

The second step in data preparation is data cleansing. Data cleansing is the process to clean dirty data. Basic data cleansing process involves identify and remove invalid,

inaccurate and out-of-scope data. Data cleansing will improve the data quality and smoothen the process of data analysis (Azeroual, Saake, & Abuosba, 2019). The researcher selected only targeted and valid respondents by filter out non-working people such as student and retiree. Besides, people who do not possess smartphone or use smartphone to assist their job directly or indirectly were removed because these people are not target respondent. Respond with incomplete answer and lots of unanswered question also will be remove from following data analysis.

3.6.3 Coding

Coding includes define numbers or other representative character to respondents' answer. Coding helps to categories all the responds in limited number of categories for easier data analysis (Cooper & Schindler, 2014). For this research, most of the question are in 5-point Likert scale closed-ended question and can be easily recode to number from 1 to 5. Extra caution also taken when recoding those reverse coded question. Whereas for education and age, number start with 1 was assigned to the lowest education level or age group and increase accordingly, from lowest to highest. Compare to closed-ended questions, coding process of open-ended questions are usually manually categorized and it take up lots of researcher's time. The advance in technology allows open-ended questions to be automated classified through machine learning (He & Schonlau, 2019; Matthews, Kyriakopoulos, & Holcekova, 2019).

3.7 Data Analysis

3.7.1 Descriptive Analysis

Descriptive analysis is the first step of data analysis. It summarise raw data and present it in a meaningful way to provide useful information to the recipient. There are 2 general categories of describe data. First category is measures of central tendency. It indicates the central area of the data distribution where most observed values fall into. Common measurement such as mean, mode, and median belong to measurement of central tendency. Second category is measures of spread. It describes how the observed values spread out from its central tendency. Common measurements of spread included variance, standard deviation, minimum, maximum and range ("Descriptive," 2018).

Descriptive analyses are performed on every variable to provide overview and better understanding on the data collected. Demographic profile information was included in descriptive analysis to generate a summary on the participants' background. Descriptive data analysis was generated using Statistical Package for Social Science (SPSS).

3.7.2 Reliability Analysis

The reliability analysis was conducted using SmartPLS 3 software. Reliability analysis perform test on variable measurement scale and each items in the construct. It usually provides insight on the relationship between each items in the construct. Based on the analysis result, researcher can ensure measurement scale is developed correctly and identify and exclude unrelated item ("Reliability," 2019). Consistent PLS algorithm was performed and the results was analysed to measure reliability of the measurement model. Internal consistency reliability was analysis using Cronbach alpha and composite reliability. Average variance extracted (AVE) and convergent validity were studied to ensure convergent validity of the measurement model. Lastly, Discriminant validity of the measurement model was confirmed using Fornell-Larcker criterion, cross loading and Heterotrait-Monotrait ratio (HTMT).

3.7.3 Inferential Analysis

Inferential analysis makes inferences on target populations using collected sample data. It helps researcher to determine if there is causal relationship between variables and strength of the relationship (Lowry, 2014). This analysis serves the purpose to predict value of dependent variable using independent variable. Consistent PLS algorithm was conducted to obtain path coefficient to study the hypothesized relationship and consistent PLS bootstrapping was used to perform statistical significant testing at 95% confidence level. All data analysis findings were summarized and discussed in chapter 4.

3.8 Conclusion

Research methodology including research design, data collection and sampling method, research instrument, construct measurement, data preparation and data analysis method were discussed and determined in this chapter. This chapter structured the path of the research and data analysis method which was employed throughout this research.

CHAPTER 4

DATA ANALYSIS AND RESULTS

4.0 Introduction

This chapter discuss the data analysis results which are generated from statistical analytic tools. Statistical software used in this chapter are SPSS and SmartPLS 3. Descriptive analysis will be performed using SPSS while reliability and inferential analysis will be performed using SmartPLS 3. SmartPLS 3 was used because of the data is non-normal distributed and our model is multi-paths. Details of the analysis are discussed later in this chapter.

4.1 Sample Profile

The questionnaire was distributed via google form and collected 349 responds. Out of 349 responds collected, 309 responds were from working adults which is our targeted population. The rest of the records were from student, unemployed and retired person. Besides that, 19 respondents reflected that they didn't use smartphone either directly or indirectly in their work which further reduce the sample size to 290. Lastly, based on the reserve coding which was set on section D of the questionnaire, responds with consistent answer across reserve and original coding question were identified. An additional 18 respondents were tagged as invalid and removed from sample. The remaining 272 respondents were tagged as valid and proceed to further data analysis. Table 4.1 summarize the sample profile of the collected data.

Table 4.1: Sample Profile

Items	Total Count
Total collected data	349
Invalid respondents	77
Invalid respondents rate	22%
Valid respondents for data analysis	272

4.2 Descriptive Analysis

Table 4.2 shows that 272 respondents consisted of 49.3% male and 50.7% which are 134 and 138 respondents respectively. There was about the same ratio of male and female in the respondents.

Table 4.2: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	134	49.3	49.3	49.3
	Female	138	50.7	50.7	100.0
	Total	272	100.0	100.0	

Table 4.3 summarize the age group of respondents. Age group for this questionnaire were categorised into 6 groups which were 18 and below, 19 to 30, 31 to 40, 41 to 50, 51 to 60 and 60 and above. There were no respondents from 18 and below because working adult is the targeted respondent. The age group with the most respondents was between age 19 to 30 which there were 101 respondents belong in this age group. This was followed by age group 31 to 40 with 96 respondents. These 2 age groups consisted of 72.4% of the respondents and the remaining 27.6% of the respondents came from age 41 and above.

Table 4.3: Age Group

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	19 to 30	101	37.1	37.1	37.1
	31 to 40	96	35.3	35.3	72.4
	41 to 50	51	18.8	18.8	91.2
	51 to 60	23	8.5	8.5	99.6
	61 and Above	1	.4	.4	100.0
	Total	272	100.0	100.0	

Table 4.4 presents the education level of the respondents. Results shows that most of the respondents were in tertiary education with diploma, degree and master qualification. Among those, most of the respondents were degree holders with a percentage of 59.6. The second highest contributor of the research came from master education level which contribute to 24.3% of the respondents in this research. There were only 12 respondents with secondary school education which is only 4.4% of the respondents.

Table 4.4: Education Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Secondary	12	4.4	4.4	4.4
	Diploma	31	11.4	11.4	15.8
	Degree	162	59.6	59.6	75.4
	Master	66	24.3	24.3	99.6
	Doctorate	1	.4	.4	100.0
	Total	272	100.0	100.0	

As shown in Table 4.5, 89.3% of the respondents were employed full time which worked more than 40 hours per week. 4.8% of the respondents were part time worker with less than 40 working hours per week. 16 of the respondents were self-employed.

Table 4.5: Employment Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Employed full time (40 or more hours per week)	243	89.3	89.3	89.3
	Employed part time (up to 39 hours per week)	13	4.8	4.8	94.1
	Self-employed	16	5.9	5.9	100.0
	Total	272	100.0	100.0	

For the job role, most of the respondents were middle management of their organization with a percentage of 29. 19.5% of the respondent were trained professional and 18.8% of the respondents played a role of junior management. The remaining 32.9% of the respondents played several different roles in their organization.

Table 4.6: Job Role

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Upper Management	26	9.6	9.6	9.6
	Middle Management	79	29.0	29.0	38.6
	Junior Management	51	18.8	18.8	57.4
	Trained Professional	53	19.5	19.5	76.8
	Support Staff	19	7.0	7.0	83.8
	Administrative Staff	6	2.2	2.2	86.0
	Consultant	23	8.5	8.5	94.5
	Skilled Labour	4	1.5	1.5	96.0
	Researcher	1	.4	.4	96.3
	Temporary Employee	1	.4	.4	96.7
	Self-employed/Partner	9	3.3	3.3	100.0
	Total	272	100.0	100.0	

4.3 Central Tendencies Measurement of Constructs

Skewness and Kurtosis were evaluated to investigate the normality of the data. Differ from Kolmogorov-Smirnov or Shapiro which test normality using significant level under null hypothesis, skewness and kurtosis describe the data and examine the non-normality level (Ho & Yu, 2015). Table 4.7 shows that SSE, PU, PEU, ATT had skewness less than -1 which indicate these are left skewed distribution. Another left skewed distribution sign is their mode is greater than median and median is greater than mean ("Skewed," 2019).

Table 4.7: Central Tendencies Measurement

	Gender	Age Group	SSE	PU	PEU	ATT	Perfo
Mean	1.51	3.00	4.3346	4.2059	4.2757	4.2941	4.1507
Median	2.00	3.00	4.5000	4.2500	4.3333	4.2500	4.0000
Mode	2	2	5.00	4.00	5.00	5.00	4.00
Skewness	-.030	.675	-1.406	-1.016	-1.190	-1.524	-.848
Std. Error of Skewness	.148	.148	.148	.148	.148	.148	.148
Kurtosis	-2.014	-.422	4.037	1.216	1.966	4.772	.942
Std. Error of Kurtosis	.294	.294	.294	.294	.294	.294	.294

To further assess the normality of the data, Kolmogorov-Smirnov and Shapiro-Wilk test were performed. At significant level of 95%, all the variable results shows significant value of 0.00 and rejects the null hypothesis in both Kolmogorov-Smirnov and Shapiro-Wilk test (Park, 2015). Thus, we can conclude that there is a significant difference between the data distribution and normal distribution. The data aren't normally distributed. The test results are summarized in table 4.8.

Based on analysis conducted above, our data are non-normal distributed and our model is multi-paths model. Partial Least Squares (PLS) analysis was employed to further examine the structural model (Chin, 1998; Chin, Marcelin, & Newsted, 2003).

Table 4.8: Normality Test

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Gender	.345	272	.000	.636	272	.000
Age Group	.223	272	.000	.839	272	.000
SSE	.136	272	.000	.875	272	.000
PU	.166	272	.000	.899	272	.000
PEU	.170	272	.000	.870	272	.000
ATT	.134	272	.000	.868	272	.000
Perfo	.165	272	.000	.897	272	.000

4.4 Testing the Measurement Model

Based on Coltman, Devinney, Midgley, & Venaik (2008), reflective or formative model can be identified using 3 theoretical considerations. First consideration is the nature of the construct. The latent variable or latent construct established independent of its measure item for reflective model and measurement item are formed based on latent variable. In contrast, formative model latent variable is formed from the measurement item based on the researcher understanding and interpretation. In this research, the measurement items were identified based on latent variable.

Second consideration is direction of causality. Reflective model usually having the causal effect coming from its latent variable to measurement items while formative model is having causality flows from the measurement items to latent variable. Therefore, changes in latent variable will cause changes in measurement items in reflective model and vice versa for formative model. In this research, the measurement items were constructed based on latent variable and can be altered without amending the latent variable.

Third consideration is characteristics of indicators. In reflective model, the measurement items are usually interchangeable and replaceable without affecting the main concept and idea of its latent variable. However, in formative model, any changes included adding or removing measurement items can result in different

interpretation of its latent variable and messed up the original concept or idea. In this research, the measurement items are easily interchangeable and can be added or removed without altering the original intention of the latent variable.

Based on the 3 considerations stated above, we can conclude that the model used in this research in reflective measurement model. Hence, consistent PLS algorithm and consistent PLS bootstrapping would be used to assess the structured equation model because normal PLS path coefficient could results in inconsistency for reflective model assessment (Dijkstra & Henseler, 2015).

Confirmatory factor analysis was conducted to examine the measurement model on its reliability and validity. As age group and education level are single-item construct, therefore the measurement model analysis isn't applicable. Measurement model testing only conducted on smartphone self-efficacy, perceived usefulness, perceived ease of use, attitude towards smartphone application usage and perceived job performance.

4.4.1 Internal Consistency Reliability

For reliability test, table 4.9 shows that all the Cronbach's Alpha are ranging from 0.807 to 0.886, which is within the acceptance range of 0.70 to 0.95 based on several different reports. Low alpha could be due to bad correlation between items and high alpha could means there is redundancy in measurement items (Tavakol & Dennick, 2011). In the case where Cronbach's alpha is less than 0.7, the measurement model need to be reviewed. Besides that, the composite reliability of all construct are above 0.8 which in the satisfactory level of between 0.7 and 0.9 (Nunally & Bernstein, 1994). Both Cronbach's alpha and composite reliability support that the construct measurement of all latent variable successfully pass reliability test.

Table 4.9: Construct Reliability and Validity

Construct	Cronbach's Alpha	Composite Reliability	AVE
Smartphone Self-Efficacy	0.807	0.806	0.518
Perceived Ease Of Use	0.807	0.810	0.589

Perceived Usefulness	0.886	0.885	0.659
Attitude Towards Smartphone Application	0.841	0.839	0.572
Perceived Job Performance	0.839	0.844	0.650

4.4.2 Convergent Validity

For convergent validity, the average variance extracted (AVE) shown in table 4.9 are above minimum threshold of 0.5 and satisfy convergent validity, whereas AVE below 0.5 suggesting there are errors in the variances explained by the construct (Alarcón & Sánchez, 2015; Fornell & Larcker, 1981).

Another measurement towards convergent validity is outer loadings. Outer loadings below 0.4 should always be removed from construct to improve reliability and convergent validity. Outer loadings between 0.4 to 0.7 need to be investigated and only be removed if the elimination of the items can help increase the composite reliability or AVE above threshold which are 0.7 and 0.5 respectively (Hair Jr, Hult, Ringle, & Sarstedt, 2017). Measurement items SSE2, SSE3, ATT3r and Perfo3 are highlighted in table 4.10 because they are below 0.7 and should be considered for removal. However, as shown in table 4.9, all composite reliability and AVE are above their threshold. Hence, no elimination of measurement items is required. No changes are done to the measurement model.

Table 4.10: Outer Loadings

	Smartphone Self-Efficacy	Perceived Ease Of Use	Perceived Usefulness	Attitude Towards Smartphone Application	Perceived Job Performance
SSE1	0.732				
SSE2	0.542				
SSE3	0.647				
SSE4	0.907				
PEU1		0.833			
PEU2		0.810			
PEU3		0.646			
PU1			0.895		

PU2	0.797		
PU3	0.752		
PU4	0.796		
ATT1		0.892	
ATT2		0.791	
ATT3r		0.575	
ATT4r		0.731	
Perfo1			0.862
Perfo2			0.912
Perfo3			0.612

4.4.3 Discriminant Validity

For discriminant validity, Smart PLS provides 3 approach to assess it which are Fornell-Larcker criterion, cross loading and Heterotrait-Monotrait ratio (HTMT). Table 4.10 illustrates Fornell-Larcker criterion. Square root of AVE is displayed in the diagonal elements. Correlations between latent variable are showed in the off-diagonal elements. For discriminate validity to be established, the square root of AVE of each construct (diagonal elements) must be greater than the inter-construct correlation (off-diagonal elements) in the respective rows and columns. As shown in table 4.10, the AVE's square root of the construct are highest in respective columns.

Table 4.11: Fornell-Larcker Criterion

	Smartphone Self-Efficacy	Perceived Ease Of Use	Perceived Usefulness	Attitude Towards Smartphone Application	Perceived Job Performance
Smartphone Self-Efficacy	**0.720**				
Perceived Ease Of Use	0.653	**0.768**			
Perceived Usefulness	0.611	0.72	**0.812**		

Attitude Towards Smartphone Application	0.657	0.745	0.699	**0.756**	
Perceived Job Performance	0.568	0.697	0.678	0.72	**0.806**

Second approach to assess discriminate validity is cross loadings. The outer loading of measurement item on the construct need be greater than all its cross loadings of other construct (Hair Jr et al., 2017). The result illustrated in table 4.11 supports discriminate validity.

Table 4.12: Cross Loadings

	Smartphone Self-Efficacy	Perceived Ease Of Use	Perceived Usefulness	Attitude Towards Smartphone Application	Perceived Job Performance
SSE1	0.732	0.444	0.481	0.503	0.443
SSE2	0.542	0.404	0.282	0.45	0.26
SSE3	0.647	0.453	0.366	0.48	0.366
SSE4	0.907	0.568	0.578	0.482	0.523
PEU1	0.566	0.833	0.64	0.602	0.58
PEU2	0.529	0.81	0.599	0.604	0.559
PEU3	0.394	0.646	0.395	0.505	0.458
PU1	0.521	0.622	0.895	0.647	0.564
PU2	0.451	0.563	0.797	0.588	0.56
PU3	0.461	0.592	0.752	0.524	0.516
PU4	0.549	0.562	0.796	0.503	0.561
ATT1	0.536	0.662	0.601	0.892	0.65
ATT2	0.464	0.586	0.553	0.791	0.573
ATT3r	0.396	0.402	0.395	0.575	0.437
ATT4r	0.587	0.572	0.543	0.731	0.494
Perfo1	0.478	0.597	0.547	0.621	0.862
Perfo2	0.48	0.603	0.576	0.656	0.912
Perfo3	0.421	0.479	0.529	0.44	0.612

Another feature in SmartPLS 3 to examine discriminate validity is HTMT. Henseler, Ringle, & Sarstedt (2015) suggested that HTMT is a better assessment tools for

discriminate validity compare to cross loadings and Fornell-Larcker. Up to 99% of specificity and sensitivity rates can be achieved by using HTMT compare to 0% of cross loadings and 20.82% of Fornell-Larcker. HTMT less than 1 supports discriminate validity. The lower the HTMT, the more different they are between the construct. There were debates on the threshold of HTMT value, but most of the suggested threshold between 0.85 to 0.9 (Ab Hamid, Sami, & Mohmad Sidek, 2017). HTMT value less than suggested threshold satisfy discriminate validity. Based on table 4.12, all the HTMT values are less than the minimum threshold value of 0.85, thus satisfies the condition for discriminate validity. All 3 measurement of discriminate validity conclude that discriminate validity is achieved in this measurement construct.

Table 4.13: Heterotrait-Monotrait Ratio (HTMT)

	Smartphone Self-Efficacy	Perceived Ease Of Use	Perceived Usefulness	Attitude Towards Smartphone Application	Perceived Job Performance
Smartphone Self-Efficacy					
Perceived Ease Of Use	0.652				
Perceived Usefulness	0.596	0.714			
Attitude Towards Smartphone Application	0.67	0.738	0.691		
Perceived Job Performance	0.564	0.703	0.691	0.712	

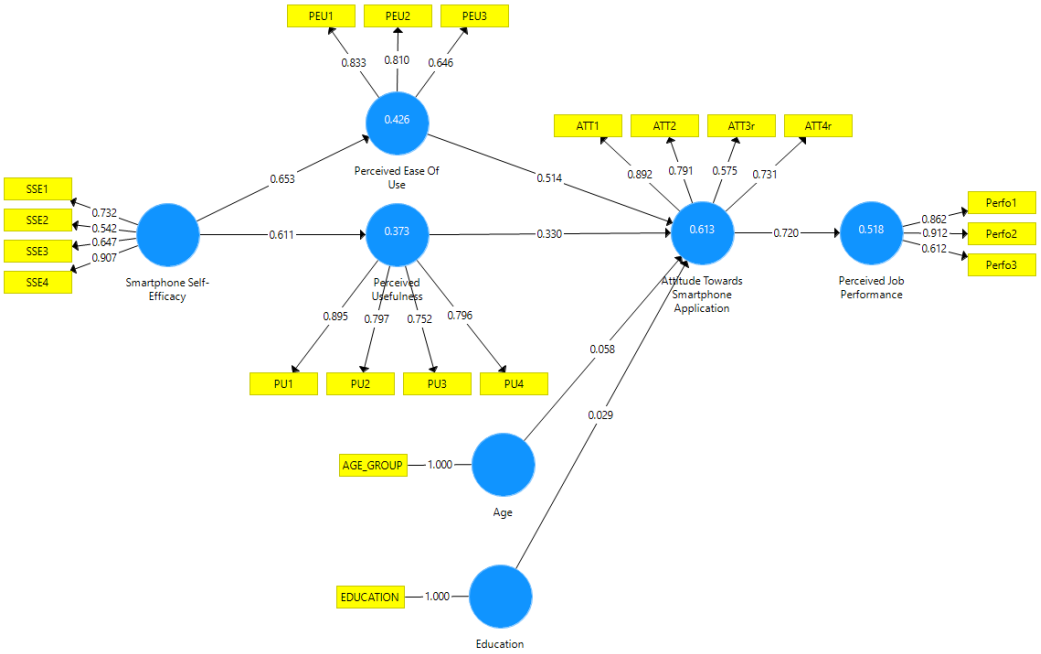
4.5 Testing the Structured Model

Consistent PLS algorithm and consistent PLS bootstrapping are conducted using SmartPLS 3 and the results are presented in figure 4.1 and figure 4.2 respectively. Path coefficient and R square (R^2) value were obtained from consistent PLS algorithm. To verify and examine the significant of hypotheses and model paths, consistent PLS bootstrapping was conducted with 5000 re-sample. Hair Jr et al.

(2017) stated that bootstrap sample should be at least greater than number of collected respond and recommended a bootstrap sample size of 5000.

4.5.1 PLSc Algorithm

Figure 4.1: PLSc Algorithm – R Square and Path Coefficients



R Square (R^2) indicates how much variance in the dependent variable can be explained by the independent variables. Higher value in R^2 typically meant better prediction accuracy and path model estimation. Henseler, Ringle, & Sinkovics (2009) proposed a rule of thumb for R^2 value which 0.75, 0.5 and 0.25 represents substantial, moderate and weak respectively. R^2 values for this structural model as shown in figure 4.1 are all above minimum threshold of 0.2. R^2 value of construct attitude towards smartphone application was 0.613 and R^2 value of construct perceived job performance is 0.518. which falls within the moderate category. Meanwhile, perceived ease of use and perceived usefulness are having R^2 values of 0.426 and 0.373 respectively that falls under weak category.

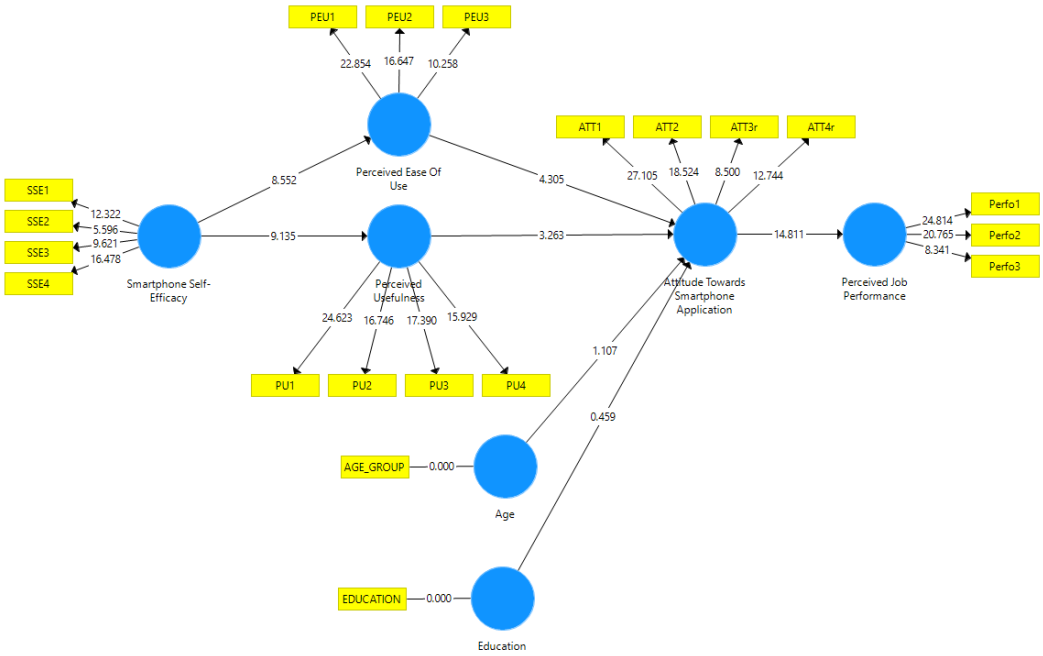
The path coefficients as shown in figure 4.1 demonstrate the relationship between latent variable. They range from -1 to 1 and positive coefficient represent positive relationship and negative coefficient represent negative relationship while the value

represents the relationship strength (Hair Jr et al., 2017). Wong (2013) stated that significant path coefficient should be at least 0.2 in order to have significant hypothesized relationship.

Based on figure 4.1, smartphone self-efficacy has a path coefficient of 0.653 towards perceived ease of use and 0.611 with perceived usefulness. Next, perceived ease of use and perceived usefulness are having 0.514 and 0.33 path coefficient with attitude towards smartphone application. Attitude towards smartphone application has 0.72 path coefficient with perceived job performance. The path coefficient between age group and education towards attitude towards smartphone application are both lower than 0.2, indicating there is no significant relationship between age group and attitude towards smartphone application and education and attitude towards smartphone application. All the path coefficients are positive, specifying that all hypothesized relationships are positive.

4.5.2 PLSc Bootstrapping

Figure 4.2: PLSc Bootstrapping - Significant Test



Even though path coefficients give us rough estimation on the significant level of the hypothesized relationship. However, statistical significance eventually should

be confirmed by performing bootstrapping to obtain path coefficient standard error (Hair Jr et al., 2017). Figure 4.2 demonstrates the t-value between and the results is summarised in table 4.14. All hypotheses except H5 and H6 are accepted at significant level of 0.05.

With t-value of 8.552 and p-value of 0, there is a significant positive relationship between smartphone self-efficacy and perceived ease of use. Hypothesis H1 is supported. Furthermore, result shows that hypothesis H2 is also supported with t-value of 9.135 and p-value of 0. We can conclude that there is a significant positive relationship between smartphone self-efficacy and perceived usefulness. Hypothesis H3 is supported with t-value of 4.305 and p-value of 0. There is a significant positive relationship between perceived ease of use and attitude towards smartphone application. Hypothesis H4 is supported with t-value of 3.263 and p-value of 0.001. There is a significant positive relationship between perceived usefulness and attitude towards smartphone application.

However, the t-value of hypothesis H5 is 1.107 which is less than 1.96 and p-value is 0.268 which is larger than 0.05 for 95% significant level. Hence, there is no significant relationship between age and attitude towards smartphone application which lead to rejection of hypothesis H5. The t-value of hypothesis H6 is 0.459 which is less than 1.96 and p-value is 0.646 which is larger than 0.05 for 95% significant level. There is no significant relationship between education and towards smartphone application. Thus, hypothesis H6 is rejected. Lastly, with t-value of 14.811 and p-value of 0, we can conclude that there is a significant positive relationship between attitude towards smartphone application and perceived job performance.

Table 4.14: Structured Model Hypothesis Testing Summary

Hypothesis	Relationship	Path Coefficient	t-value	p-value	Hypotheses decision

H1	Smartphone Self-Efficacy -> Perceived Ease Of Use	0.653	8.552	0.000	Accepted
H2	Smartphone Self-Efficacy -> Perceived Usefulness	0.611	9.135	0.000	Accepted
H3	Perceived Ease Of Use -> Attitude Towards Smartphone Application	0.514	4.305	0.000	Accepted
H4	Perceived Usefulness -> Attitude Towards Smartphone Application	0.330	3.263	0.001	Accepted
H5	Age -> Attitude Towards Smartphone Application	0.058	1.107	0.268	Rejected
H6	Education -> Attitude Towards Smartphone Application	0.029	0.459	0.646	Rejected
H7	Attitude Towards Smartphone Application -> Perceived Job Performance	0.72	14.811	0.000	Accepted

4.6 Conclusion

This chapter presents the results output regarding the research question and hypotheses. The measurement model successfully passes the test to be adapted in this research. Whereas on the structural equation mode, five out of seven tested hypotheses are supported based on the analysis results. H5 and H6 are not supported and the potential causes are discussed in next chapter. The results also show that among all tested hypotheses, all passed hypotheses are having positive impact. Attitude towards smartphone application has the strongest impact on perceived job performance. It is followed by smartphone self-efficacy on perceived usefulness and smartphone self-efficacy on perceived ease of use.

CHAPTER 5

DISCUSSION AND CONCLUSION

5.0 Introduction

This chapter discusses on the research findings based on results obtained from previous chapter. Implication of the study, limitation and proposed recommendations are also summarized in this chapter to serve as references for future studies.

5.1 Summary of Statistical Analysis

Out of 349 respondents took part in the questionnaire survey, there are 272 valid respondents which was used to carried out data analysis. Out of 272 valid respondents, there are 134 male and 138 female respondents which are around the same ratio. More than half of the valid respondents are between age 19 to 40 where 101 respondents are within 19 to 30 age group while 96 respondents are within age group 31 to 40. It was also discovered that 84.3% of the respondents had received education higher than or equal to university level. Furthermore, 89.3% of the valid respondents were employed full time, 4.8% of the respondents are employed part time, and the rest are self-employed. This study received respond from all level of position within organization from temporary employee to upper management. Based on central tendencies measurement and normality test, skewness, kurtosis, Kolmogorov-Smirnov and Shapiro-Wilk tests indicate that the data aren't normally distributed. Taking into consideration which the research model is multi-paths and non-normal distributed, further data analysis was conducted using Partial Least Square Structural Equation Modelling method using SmartPLS 3.

Testing on measurement model shows that all the measurement items are reliable and accurate to measure respective construct and variable. As this is a reflective measurement model, consistent PLS algorithm was conducted. First, Cronbach's Alpha testing shows that all measurement constructs are all reliable with alpha value greater than 0.7. The same goes to composite reliability which are having value larger than 0.7. These support the internal consistency reliability of the measurement model. Following that, convergent validity is established using average variance extracted (AVE). All latent variables are having AVE larger than minimum threshold of 0.5. There is some discrepancy when it comes to outer loading. Item SSE2, SSE3, ATT3r, Perfo3 are having outer loadings less than 0.7. Based on Hair Jr et al. (2017), measurement item with outer loadings 0.7 should be considered for removing if the removal will improve the composite reliability and AVE above minimum threshold. In this research, the composite reliability and AVE are already acceptable and lies above minimum threshold. Hence, there is no removal of measurement item. Last part of the measurement model testing is discriminant validity. All measurement scales successfully support the requirement of discriminant validity.

Structural model and hypotheses testing shows that all hypothesised variable are positively related. However, hypothesis H5 and H6 wasn't supported and we conclude that there is no significant relationship for age and education towards attitude towards smartphone application. Remaining hypotheses are proved to be supported at significant level of 95% (α=0.05). We can conclude that there is significant relationship between smartphone self-efficacy and perceived ease of use, smartphone self-efficacy and perceived usefulness, perceived ease of use and attitude towards smartphone application, perceived usefulness and attitude towards smartphone application, and attitude towards smartphone application and perceived job performance. Lastly, R Square value of perceived job performance is 0.518, which indicates that 51.8 percent of the variance in perceived job performance can are explainable by attitude towards smartphone application.

5.2 Discussions of Major Findings

Based on the research findings, relationship between smartphone application usage and perceived job performance was examined. Extended TAM used in this research proved to be applicable for research regarding technology usage and job performance. This model provides good insight and explanation towards job performance, and up to 51.8% of the variance in job performance can be explained using extended TAM.

5.2.1 Research Objective 1

The first research objective is to investigate the relationship between smartphone self-efficacy and perceived ease of use. This objective was attained with hypothesis testing H1. Result shows that there is significant positive relationship between smartphone self-efficacy and perceived ease of use. This result supports and implies the same findings from prior studies (Isaac et al., 2017; Mbira, 2018). It means that worker that belief they have the ability to utilise smartphone and get use of smartphone very easily would have better convenience in using smartphone to perform activity. This is probably because they spend less time to figure how to use smartphone and able to use it without lengthy or difficulty in process of learning.

5.2.2 Research Objective 2

The second research objective is to investigate the relationship between smartphone self-efficacy and perceived usefulness. This objective was accomplished by hypothesis testing H2. Result shows that there is significant positive relationship between smartphone self-efficacy and perceived usefulness. This results is consistent with prior findings (Isaac et al., 2017; Mbira, 2018). This indicates that the more the worker belief on their capability in utilizing smartphone function, the more the worker feel the smartphone application is more useful. This is because with better understanding on smartphone application, they are able to use more function and perform more activities using smartphone which helps completing task quicker and easier.

5.2.3 Research Objective 3

The third research objective is to investigate the relationship between perceived ease of use and attitude towards smartphone application. This objective was achieved by hypothesis testing H3. Result shows there is significant positive relationship between perceived ease of use and attitude towards smartphone application. This result is consistent with previous research findings (Chung et al., 2014; Isaac et al., 2017). This implies that if worker find that the smartphone application is easy to use, they will also have better impression and attitude towards smartphone application.

5.2.4 Research Objective 4

The fourth research objective is to investigate the relationship between perceived usefulness and attitude towards smartphone application. This objective was assessed by hypothesis testing H4. Result shows there is significant positive relationship between perceived usefulness and attitude towards smartphone application. Chung et al. (2014) and Isaac et al. (2017) also obtained the same research findings. This result indicates that if smartphone applications are recognized to be useful in performing daily task or activities, worker will have better attitude towards smartphone application and use them more often.

5.2.5 Research Objective 5

The fifth research objective is to investigate the relationship between education and attitude towards smartphone application. This objective was achieved by hypothesis testing H5. This hypothesis is not supported in this research study. There is no significant relationship between education and attitude towards smartphone application. This result contradicts with result finding from Ng & Feldman (2009). However, this result finding is supported by Azam, Sabudin, Osman, & Shiang-Yen (2011). The unsupported hypothesis H5 could probably be one of the setback due to limitation. Recommendations are provided at later in this chapter for further study to further examine this research objective.

5.2.6 Research Objective 6

The sixth research objective is to investigate the relationship between age and attitude towards smartphone application. This objective was attained by hypothesis testing H6. Unfortunately, hypothesis testing H6 shows that there is no significant relationship between age and attitude towards smartphone application. Hypothesis H6 is not supported. This result is differ with Ng & Feldman (2008) research findings but consistent with prior studies conducted by Almahdi (2017), Shely Khatun, Rana, & Ali (2017) and Connolly et al. (2018). Further research regarding age and attitude towards smartphone application, and also job performance are recommended, if the limitation stated in the following section can be resolved.

5.2.7 Research Objective 7

The seventh research objective is to investigate the relationship between attitude towards smartphone application and perceived job performance. This research objective was achieved by hypothesis testing H7. There is a significant positive relationship between attitude towards smartphone application and perceived job performance. This results is supported and consistent with Chung et al. (2014) and Isaac et al. (2017) works. In addition, this finding link up from research objective 1 to research objective 7. It explains that worker with better utilisation of smartphone application and function will have better user experience and make better use out of smartphone. This lead to good perception and attitude towards smartphone application which drives them to discover more smartphone application to assist in their task. Eventually, all the elements are converted into the increase in perceived job performance.

5.3 Implication of the Study

5.3.1 Managerial Implication

The findings suggested a few implications for organization and individual because it identifies the elements to improve job performance. Based on results where smartphone self-efficacy indirectly improves perceived job performance. Individual with smartphone application usage can improve smartphone self-efficacy. Self-efficacy originated from various sources including task performance, vicarious

experiences and verbal persuasion (Margolis & Mccabe, 2006). Thus, individual able to train and expose themselves to more smartphone tips or training which helps utilize their smartphone better. There are several organization or smartphone manufacturing company which provide smartphone training course for their customer ("Courses," 2019; "Samsung," 2019). Besides that, based on the research findings, education level and age do not have any impact on the attitude towards smartphone application. Therefore, individual regardless of age and education can also have better confidence in using smartphone application instead of common social stereotype about elderly in modern technology (Holmberg, 2019).

From organization perspective, management can plan and develop courses related to smartphone application usage to train their staff. Specific tools and function can be introduced to their employee in the purpose of improving job performance. With better understanding and knowledge in smartphone application, smartphone self-efficacy will increase and employee able to make better use of smartphone and translate it into performance improvement. Again, this can be done regardless of education level and age of employee based on our research findings. With proper policy implication and training on proper smartphone usage, smartphone usage and lead to better job performance and work quality. Hence, management should also encourage the usage of smartphone along with the training provided.

On the other hand, productivity is an important category in smartphone application. However, it only rank number 10 with 2.99% shares from all available category in Apple App Store("Most," 2019). Mobile apps developer should also focus more than developing productivity apps which had proved to be useful and required by most working adults.

5.3.2 Theoretical Implication

Extended Technology Acceptance Model (TAM) adapted from Chung et al. (2014) and Isaac et al. (2017) is the foundation of the research model. This research supports the application of the extended TAM and provide further insight on this model for future application. Furthermore, it also successfully identifies and supports the influence of smartphone self-efficacy, perceived ease of use, perceived

usefulness and attitude towards smartphone application towards job performance. This helps to established the theory towards technology usage and impacted job performance and path the way for future relevant studies.

5.4 Limitations

There are 3 limitations of this study. First, data was collected via self-administrated questionnaire using Google Form. Although the survey link was shared via social media to expose to whole Malaysia, majority of the respondents still came from Klang Valley with only small portion of the respondents from other states of Malaysia. The sample probably unable to fully represent the entire Malaysia worker population and so do the research findings. Furthermore, most of the respondents seems to belongs to age 21 to 40, and education level within tertiary level, which could contribute to the insignificant relationship for respective hypotheses.

Second, the addictive nature of smartphone application wasn't taken into consideration during the development of this research due to time constrain. This research study mainly focuses on the impact of smartphone application usage towards job performance while ignoring the influence that caused by the entertainment or social stress that could arise due to smartphone usage. There are prior studies which showed that addiction in smartphone could lead to drop in productivity (Duke & Montag, 2017).

Lastly, data collected were originated from self-reported measure on respondents' smartphone application usage and job performance. As Yu (2010) mentioned, self-reported data could be biased and not directly reflected the real condition. This is because respondents tend to answer what they believe and what they remember which might not be the truth for every cases. For instance, self-reported job performance can be different from the truth job performance which is recorded on employee yearly performance evaluation.

5.5 Recommendation

Along with the limitations, there are a few recommendations which we can propose for future research study. With better resources and timeframe, future studies are

suggested to collect more sample and evenly distributed the research across whole country to get an overall insight of Malaysia on the area of smartphone application usage and job performance. The insignificant relationship between age and attitude towards smartphone application, education and attitude towards smartphone application should also be investigate further with larger sample size and similar ratio of respondents across different age group and education.

Second, it will be interesting for researcher to look into the relationship of smartphone application usage and job performance with moderating variable such as smartphone addiction and smartphone distraction. It's worth exploring because as long as someone is using smartphone, they are unable to avoid all this issue and thus the following impact on their performance. Third, due to the possible bias results generated by self-reported data, it is recommended for future studies to be conducted with objective and longitudinal data.

5.6 Conclusion

In conclusion, all the research objectives have been achieved. All hypothesis testing except H5 and H6 are accepted. Research findings conclude that smartphone self-efficacy does significantly impact perceived job performance through perceived ease of use, perceived usefulness and attitude towards smartphone application. Extended Technology Acceptance Model was examined and identified to be applicable for investigating relationship between new technology and job performance.

This research highlighted the important of new technology such as smartphone and its impact towards job performance. Valuable insights are provided through this research for organization and individual to formulate their strategy into improving their job performance. They must adapt to the social trend and use it for their advantages so that they do not get eliminated and ousted by social progress. Last but not least, perhaps these research findings can serve as a meaningful reference for future relevant study and encourage more researcher to contribute towards this area of interest about technology and job performance.

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APPENDIX A

SURVEY QUESIONNAIRE

A Study on the Usage of Smartphone Application towards Job Performance

Dear Respondents,

I am currently pursuing Master of Business Administration (MBA) at Universiti Tunku Abdul Rahman (UTAR). As part of the fulfillment of my MBA Final Year Project, I am required to conduct this research and I appreciate your co-operation in order to complete the survey. The purpose of this study is to examine the impact on the usage of smartphone application towards job performance. Thus, this study serves as reference to provide insight for organizations to formulating strategy and policy on usage of smartphone by employees.

I would be grateful if you can take 10 minutes to fill the questionnaire. Your answers are extremely valuable and will certainly make an important contribution to this study. All the information collected is for research purposes and will be kept completely confidential.

Thank you.

Yours Sincerely,
Kee Kenth
H/P: +6012-716 3357
Email: kenthkee@gmail.com

* Required

1. **What is your current employment status?** *
   Mark only one oval.

   - ◯ Employed full time (40 or more hours per week)
   - ◯ Employed part time (up to 39 hours per week)
   - ◯ Self-employed
   - ◯ Unemployed *Stop filling out this form.*
   - ◯ Retired *Stop filling out this form.*
   - ◯ Student *Stop filling out this form.*

Demographic Profile

The following personal information is necessary for validation of the questionnaire. All responses will be kept confidential. Your cooperation in providing this information will be greatly appreciated.

2. **Gender** *
   Mark only one oval.

   - ◯ Male
   - ◯ Female

3. **Age Group** *

Mark only one oval.

- 18 and Below
- 19 to 30
- 31 to 40
- 41 to 50
- 51 to 60
- 61 and Above

4. **Highest Education Level** *

Mark only one oval.

- Primary
- Secondary
- Diploma
- Degree
- Master
- Doctorate
- Other: _____

5. **Please select the category that best represents the industry you currently work at (regardless of your actual position)** *

Mark only one oval.

- ◯ Agriculture, Forestry, Fishing and Hunting
- ◯ Mining
- ◯ Utilities
- ◯ Construction
- ◯ Computer and Electronics Manufacturing
- ◯ Other Manufacturing
- ◯ Wholesale
- ◯ Retail
- ◯ Transportation and Warehousing
- ◯ Publishing
- ◯ Software
- ◯ Telecommunications
- ◯ Broadcasting
- ◯ Information Services and Data Processing
- ◯ Other Information Industry
- ◯ Finance and Insurance
- ◯ Real Estate, Rental and Leasing
- ◯ College, University and Adult Education
- ◯ Primary/Secondary School Education
- ◯ Other Education Industry
- ◯ Health Care and Social Assistance
- ◯ Arts, Entertainment, and Recreation
- ◯ Hotel and Food Services
- ◯ Government and Public Administration
- ◯ Legal Services
- ◯ Scientific or Technical Services
- ◯ Homemaker
- ◯ Military
- ◯ Religious
- ◯ Other Industry

6. **Which of the following best describes your role in company?** *
Mark only one oval.

- ◯ Upper Management
- ◯ Middle Management
- ◯ Junior Management
- ◯ Trained Professional
- ◯ Support Staff
- ◯ Administrative Staff
- ◯ Consultant
- ◯ Skilled Labour
- ◯ Researcher
- ◯ Temporary Employee
- ◯ Self-employed/Partner

7. **Do you use smartphone application to assist your works? (Including using email/social media for working purpose)** *
Mark only one oval.

- ◯ Yes
- ◯ No *Stop filling out this form.*

Smartphone Self-Efficacy

This section consists of 4 likert-scale items for research subjects. Kindly select from a scale of 1 to 5 based on how agreeable you are to the statement given.

8. **I am able to figure out how to use the interface of a smartphone on my own.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

9. **I am able to figure out how to download smartphone applications on my own.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

10. **I am able to figure out how to use apps on my own.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

11. **I am able to figure out how to use the different functions provided by smartphones on my own.** *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

Perceived Usefulness

This section consists of 4 likert-scale items for research subjects, Kindly select from a scale of 1 to 5 based on how agreeable you are to the statement given.

12. **Using smartphone application enable me to accomplish tasks more quickly.** *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

13. **Using smartphone application enhances my task effectiveness.** *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

14. **Using smartphone application makes it easier to do my task.** *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

15. **Smartphone application is useful in performing my task.** *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

Perceived Ease of Use

This section consists of 3 likert-scale items for research subjects. Kindly select from a scale of 1 to 5 based on how agreeable you are to the statement given.

16. **It is easy to use smartphone application to assist in my daily work.** *

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

17. **It is easy to get smartphone application to do what I want it to do.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

18. **It is convenient to access smartphone application for working purpose.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

How do you feel about your overall experience of smartphone application use for working purpose?

19. **I am satisfied with my overall experience of smartphone application use.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

20. **My overall experience of smartphone application is pleased.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

21. **Most of the time, I am having frustrating experience while using smartphone application.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

22. **My overall experience while using smartphone application is terrible.** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

Perceived Job Performance Gain from Smartphone Application

This section consists of 3 likert-scale items for research subjects. Kindly select from a scale of 1 to 5 based on how agreeable you are to the statement given.

23. **I successfully use smartphone application to assist my job** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

24. **I am satisfied with the effect of using smartphone application on my job performance** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

25. **Using smartphone application helps reduce the time of performing the job tasks** *
Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

APPENDIX B

ETHICAL APPROVAL FORM

UNIVERSITI TUNKU ABDUL RAHMAN
Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Re: U/SERC/199/2019

3 October 2019

Ms Low Suet Cheng
Department of Accounting
Faculty of Accountancy and Management
Universiti Tunku Abdul Rahman
Jalan Sungai Long
Bandar Sungai Long
43000 Kajang, Selangor

Dear Ms Low,

Ethical Approval For Research Project/Protocol

We refer to your application for ethical approval for your research project (Master student's project) and are pleased to inform you that your application has been approved under expedited review.

The details of your research project are as follows:

Research Title	A Study on the Usage of Smartphone Applications Towards Job Performance
Investigator(s)	Ms Low Suet Cheng Kee Kenth (UTAR Postgraduate Student)
Research Area	Social Sciences
Research Location	Malaysia
No of Participants	400 participants (Age: 16 and above)
Research Costs	Self-funded
Approval Validity	3 October 2019 - 2 October 2020

The conduct of this research is subject to the following:

(1) The participants' informed consent be obtained prior to the commencement of the research;

(2) Confidentiality of participants' personal data must be maintained; and

(3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.

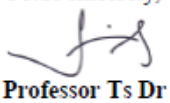
Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
Tel: (605) 468 8888 **Fax**: (605) 466 1313
Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288 **Fax**: (603) 9019 8868
Website: www.utar.edu.my

Should you collect personal data of participants in your study, please have the participants sign the attached Personal Data Protection Statement for your records.

The University wishes you all the best in your research.

Thank you.

Yours sincerely,



Professor Ts Dr Faidz bin Abd Rahman
Chairman
UTAR Scientific and Ethical Review Committee

c.c Dean, Faculty of Accountancy and Management
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