UTAUT2 INFLUENCING THE BEHAVIOURAL INTENTION TO ADOPT MOBILE APPLICATIONS

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DECLARATION

We hereby declare that:

(1) This undergraduate research project is the end result of our 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) Equal contribution has been made by each group member in completing the research project.

(4) The word count of this research report is 8,639.

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We dedicated this research to:

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LIST OF ABBREVIATIONS

ANOVA	Analysis of Variance
Apps	Applications
BI	Behavioural Intention
C-TAM-TPB	Combined TAM and TPB
DF	Degrees of Freedom
EE	Effort Expectancy
FC	Facilitating Condition
HM	Hedonic Motivation
HT	Habit
ICTs	Information and Communication Technology
IDT	Innovation Diffusion Theory
IT	Information Technology
MBA	Master of Business Administration
MCMC	Malaysian Communications and Multimedia Commission
MLR	Multiple Linear Regressions
MM	Motivational Model
MPCU	Model of PC Utilization
MTLE	Mobile Technology in the Learning Environment
NFC	Near Field Communication
PDA	Personal Digital Assistant
PE	Performance Expectancy
PV	Price Value
R^2	Coefficient of Determination
SCT	Social Cognitive Theory
SD	Standard Deviation
SEM	Structural Equation Modelling
SI	Social Influence
TAM 2	Technology Acceptance Model 2
TAM	Technology Acceptance Model
TPB	Theory of Planned Behaviour
TRA	Theory of Reasoned Action
U.S	United States

UTAR	Universiti Tunku Abdul Rahman
UTAUT2	Extended Unified Theory of Acceptance and Use of Technology

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PREFACE

The market for mobile applications (apps) has been increasing rapidly as most daily activities nowadays involve the use of mobile apps. There is huge potential for this service mode in the mobile market as it is overturning the traditional business model of mobile industry. Since there is an increased importance in mobile apps, it has created new opportunities for the mobile market. With more users worldwide, organisations soon work to promote apps, engage consumers through apps and advertise within the apps. Thus, consumer's acceptance is very vital in the mobile apps market. This leads to the interest to study on the factors influencing the behavioural intention to adopt mobile applications to develop this industry successfully.

ABSTRACT

This research adopts the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) model to determine the key determinants (performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value and habit) that influence the behavioural intention to adopt mobile applications (apps) in Malaysia. The elements are combined to focus on consumer use context. This study uses UTAUT2 model as there have been no past studies using the UTAUT2 model in the context of mobile apps as a whole.

The study is based on empirical data collected from questionnaires distributed to a sample of 300 young users of smartphone devices drawn from the largest private university in Perak state. Multiple linear regression tests are used to evaluate the collected data. Thus, the results show that PE, EE, HM and Habit influence the behavioural intention to adopt mobile apps while SI, FC and PV does not influence the behavioural intention to adopt mobile apps. With this research, managers of the app development market can predict the continued use of mobile apps to promote, engage consumers and advertise within apps more effectively.

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

This chapter discusses the background, problem statement, research objectives and questions and lastly the significance of this study.

1.1 Research Background

The use of mobile applications (apps) is rapidly growing ever since Apple first introduced the iPhone in 2007. Mobile apps are end-user software apps created for mobile device operating systems which extend the capabilities of the device (Purcell, 2011). It is also defined as programmes that run on mobile devices and carry out tasks of banking to gaming and web browsing (Taylor, Voelker & Pentina, 2011). Organisations especially in America realised a huge business potential in using mobile apps for marketing and engaging customers (Yang, 2013). This new service mode has created new opportunities for the mobile industry, overturning the traditional business model (Wang, Liao & Yang, 2013).

According to Portio Research (2013), it is estimated that there are 1.2 billion mobile apps users worldwide at the end of 2012, where Asia Pacific accounts for the largest number of users. It is expected to reach 4.4 billion users by the end of 2017. With this increasing penetration of mobile apps in the market, Malaysian mobile apps users also increased (Malaysian Communications and Multimedia Commision, 2012). The average Malaysian consumes 27% of their time on mobile activities, which includes 25% on mobile entertainment, followed by mobile games, social media, general information and search, e-mail and shopping (InMobi, 2012).

In short, new opportunities and increased use of mobile apps makes it vital to determine the elements that influences consumer's behavioural intention to adopt mobile apps as a whole since little research has been done on it.

1.2 Problem Statement

Portio Research (2013) estimated that app revenues of US$12 billion were generated worldwide in 2012, and are forecasted to grow to $63.5 billion in 2017. However, for most app developers, apps development is not financially rewarding. According to VisionMobile (2013), 67% of developers around the world earn less than US$500 per app a month which is insufficient to sustain their business. A study by Localytics (2011) found that one on four mobile apps once downloaded is never used again. In Malaysia, only 22.3% of users check their mobile apps when informed or prompted (MCMC, 2012). In order to stay competitive, it is necessary to understand the direct relationship between consumer's perception on mobile apps usage so developers can come up with effective strategies to promote mobile apps, engage consumers with apps, and advertise within apps (Yang, 2013). Thus, it is important for managers to understand the predictors of mobile apps adoption by consumers.

Despite the pervasiveness of mobile apps penetration in Malaysia, there is limited understanding of consumers' acceptance of mobile apps. For instance, most of the past studies focused on the behavioural intention of specific mobile apps such as mobile services (Islam, Kim, & Hassan, 2013), m-shopping (Yang, 2010), m-commerce (Min, Ji, & Qu, 2008), and these studies are not conducted in Malaysia. Studies conducted in Malaysia on specific mobile apps are Leong, Ooi, Chong and Lin (2013a) which examined the behavioural intention to use mobile entertainment, Goi and Ng (2011) explored the perception of young consumers on m-commerce, Jayasingh and Eze (2009) studied the behavioural intention of consumers using m-coupons, Leong, Hew, Tan & Ooi (2013b) researched on the factors that influence the adoption of NFC (Near Field Communication) enabled m-credit card and Jambulingam (2013) identified the determinants that influence

the behavioural intention to adopt Mobile Technology in Learning Environment (MTLE) in Malaysia.

Besides, many studies integrated models other than the extended unified theory of acceptance and use of technology, known as UTAUT2 model which was developed by Venkatesh, Thong and Xu (2012). Moreover, past studies have tried to understand consumer's acceptance of mobile apps using many other models. A study conducted by Yang (2013) has determined the intention to use mobile apps using the Theory of Planned Behavior (TPB) and Technology Acceptance Model (TAM). Another study conducted by Taylor et al. (2011) integrated the Diffusion Model and Network Model about the usage of mobile applications. Chen, Meservy and Gillenson (2012) evaluated the antecedents of mobile apps continuance using the extended Expectation-Confirmation Model of Information System Continuance. In addition, a study conducted by Wang et al. (2013) using the Theory of Consumption Values to determine the behavioural intention to use mobile apps.

Furthermore, studies using the UTAUT2 model on behavioural intention to adopt mobile apps in Malaysia have not been conducted before. Although there are many other technology models, UTAUT2 model has additional elements not present in the other models mentioned namely hedonic motivation (HM), price value (PV) and habit. The elements in UTAUT2 are combined to focus on consumer use context rather than technology acceptance and use of employees (Venkatesh et al. 2012).

In short, this research will focus only on mobile apps as a whole and further validate the UTAUT2 model in Malaysia. As consumer's acceptance is the foundation of mobile apps success, this study will evaluate the factors that affect behavioural intention to adopt apps which will be useful to parties earning profits from apps development.

1.3 Research Objectives

1.3.1 General Objective

This study identifies the key determinants that influence the behavioural intention to adopt mobile apps using the UTAUT2 model.

1.3.2 Specific Objectives

Specific objectives are as follows:

1. To analyse the association and influence of performance expectancy on behavioural intention to adopt mobile apps.
2. To analyse the association and influence of effort expectancy on behavioural intention to adopt mobile apps.
3. To analyse the association and influence of social influence on behavioural intention to adopt mobile apps
4. To analyse the association and influence of facilitating conditions on behavioural intention to adopt mobile apps.
5. To analyse the association and influence of hedonic motivation on behavioural intention to adopt mobile apps.
6. To analyse the association and influence of price value and its influence on behavioural intention to adopt mobile apps.
7. To analyse the association and influence of habit on behavioural intention to adopt mobile apps.

1.4 Research Questions

Research questions are as follows:

1. Does performance expectancy influence the behavioural intention to adopt mobile apps?
2. Does effort expectancy influence the behavioural intention o adopt mobile apps?
3. Does social influence influence the behavioural intention to adopt mobile apps?
4. Does facilitating conditions influence the behavioural intention to adopt mobile apps?
5. Does hedonic motivation influence the behavioural intention to adopt mobile apps?
6. Does price value influence the behavioural intention to adopt mobile apps?
7. Does habit influence the behavioural intention to adopt mobile apps?

1.5 Significance of Study

From a theoretical standpoint, UTAUT2 has an additional of three elements, i.e. HM, PV and HT. As a result, UTAUT2 will better justify technology acceptance of consumers by improving the variance in behavioural intention by 18% and technology use by 12% (Venkatesh et al. 2012). Although there are many studies that present mobile literature, few have integrated the UTAUT2 model. This study is significant as it is using the UTAUT2 model to test its influence on behavioural intention to adopt mobile apps which will further validate the extended UTAUT model in Malaysia.

In terms of practical significance, this study will provide practitioners in the mobile industry with a better idea on how to develop and improve apps that support users' needs and enhance the usability of mobile apps. Converting UTAUT2 into a goal-oriented model can help app developers and managers

predict the continued use of a technology (Mandal & McQueen, 2012). Thus, this will benefit the mobile apps industry as a whole because UTAUT2 helps to determine its influence on behavioural intention to adopt mobile apps in Malaysia.

1.6 Chapter Layout

The first chapter provides a background, problem statement, objectives and significance of this research. Chapter 2 reviews past studies by outlining the seven elements of UTAUT2 which influences the behavioural intention, explaining the theoretical foundation of UTAUT2 model, and developing hypotheses based on the literature. In Chapter 3, the research design will be formulated, followed by the methodology for sampling procedures, data collection, measurement of variables and data analysis. Chapter 4 interprets the results based on data analysis and Chapter 5 summarises the major findings, implications and limitations of this study. Lastly, Chapter 5 provides recommendations for future research.

1.7 Conclusion

This chapter discussed the problems, objectives and significance of the study. After providing an overview on the UTAUT2 model and mobile applications, this study aims to determine the factors that influence the behavioural intention to adopt mobile apps. A literature review will be provided in the following chapter.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

This chapter discusses the theoretical models applied and the review of past literature. Also, the theoretical framework and hypotheses are developed.

2.1 Review of the Literature

This section reviews prior empirical studies and shows the relationship between each independent variable (PE, EE, SI, FC, HM, PV and HT) and the dependent variable (BI) to adopt technology.

2.1.1 Behavioural Intention (BI)

Islam et al. (2013) defined behavioural intention as an individual's intention to perform a given act which can predict corresponding behaviours when an individual acts voluntarily. Besides that, behavioural intention is the subjective probability of carrying out behaviour and also the cause of certain usage behaviour (Yi, Jackson, Park & Probst, 2006). Thus, intentions show the motivational factors that influence behaviour and are indicators of how hard people are willing to try and the effort they put in to engage in a behaviour (Mafe, Blas & Tavera-Mesias, 2010). Also, it was found that behavioural intention is to be the main factor of individual mobile services usage and that usage intentions are rational indicators of future system use (Mafe et al. 2010).

2.1.2 Performance Expectancy (PE)

PE is the degree to which users gain benefits in using a technology while carrying out activities (Venkatesh et al. 2012). Sun, Cao and You (2010) found that perceived usefulness has a positive influence on BI to use m-commerce in China, based on an online survey collected and validated using structural equation modeling (SEM). This result was in accordance with Leong et al. (2013b) who found that perceived usefulness has a positive effect on BI to use m-credit card. Data was collected from users of Perak, Malaysia via questionnaire and was analysed using SEM. This is further supported by empirical studies of AbuShanab and Pearson (2007) in Jordan that customers with high PE has high BI to use internet banking based on the questionnaires collected and evaluated using multiple linear regressions (MLR). These empirical studies reveal that PE as a significant factor to influence the BI to adopt mobile technology.

However, Im, Hong and Kang (2011) found that the influence of PE on BI to adopt MP3 and internet banking was insignificant and indifferent across two countries, based on the survey questionnaire collected from undergraduate and graduate students in U.S. and Korea. In this study, a covariance SEM was used to test the UTAUT model.

2.1.3 Effort Expectancy (EE)

EE is the degree to which a technology is easy to use (Jambulingam, 2013). Teo and Noyes (2012) carried out a survey questionnaire among Singapore trainee teachers and found that EE significantly influence individual BI to use information technology, using SEM approach. Besides, Tan, Sim, Ooi and Phusavat (2011) found using multiple regression that perceived ease of use significantly influences the BI in adopting m-learning based on the data collected via questionnaire from university students in Perak, Malaysia. The similar results from these

empirical studies show that EE has positive influence on the BI to the adoption of technology.

However, Wu, Tao and Yang (2007) proved that EE does not significantly influence the BI of consumers to adopt 3G mobile telecommunication services in Taiwan using SEM and the results of the questionnaires. It states that only "ease of use" is not adequate to attract the users. Besides, the study of Yang (2010) indicated that EE insignificantly influences attitude of US consumer toward using m-shopping services, based on an online survey collected from the purchased consumer panel validated using SEM.

2.1.4 Social Influence (SI)

SI is an individual's perception that significant others believe the individual should adopt the information system (Leong, Hew, Tan and Ooi, 2013). Akour (2009) found that extrinsic influence (superior and peer influence) of freshman students in Oklahoma State University is the most influential factor of m-learning acceptance in tertiary education evaluated using MLR and analysis of variance (ANOVA). This is further supported by Taylor et al. (2011) who surveyed U.S. Midwest universities found that students' adoption and usage of mobile apps is strongly influenced by their friends compared to family members, tested using logistic regression models. Furthermore, Leong et al. (2013a) proved that SI has an essential role in influencing the BI to use m-entertainment, based on survey questionnaires collected from users of mobile devices in Malaysia using SEM. These empirical studies agree that SI is a significant factor in influencing the BI to adopt mobile technology.

In contrast, Yang (2013) found that subjective norm does not influence the intention to use mobile apps, based on an online survey conducted among college students in Southeast America and evaluated using multiple regression analyses and SEM. A similar study conducted by Lu, Yao and

Yu (2005) among university students in Texas through an online and offline survey method. The results of SEM showed that SI in the form of subjective norm and image negatively influences the adoption intention of wireless internet services via mobile technology.

2.1.5 Facilitating Conditions (FC)

FC is the perception that organisational and technical infrastructure exists to support the use of technology (Venkatesh et al. 2003). Yeoh & Chan (2011) found using MLR that FC significantly influences the BI to adopt internet banking, based on questionnaires collected from respondents aged 21-50 years in Malaysia. Also, Wu et al. (2008) found that FC significantly influences behavioural intention for 3G mobile telecommunication services. These empirical studies agree that FC is a significant factor in influencing the BI to adopt technology.

However, Teo et al. (2012) argued that there was no significant influence of FC on the BI to use technology. Also, Jambulingam (2013) found that FC is not significant drivers of BI that influences m-learning adoption. According to Prensky (2001) members of current generation can use gadgets without referring to the user manual, as cited in Jambulingam (2013).

2.1.6 Hedonic Motivation (HM)

HM is the fun or pleasure derived from using a technology (Brown & Venkatesh, 2005). To, Liao and Lin (2007) found using SEM that the Internet shopping motivations of adults in Taiwan from hedonic perspectives directly influences the intention to search, but an indirectly influence the intention to purchase. This is further illustrated in Magni, Taylor and Venkatesh (2010) that hedonic factors affect individual's

intentions to explore a technology, but the effects differ across stages of technology adoption. This study was carried out on MBA students at a large public university in U.S and tested using partial least squares. From these past studies, it is safe to assume that theoretically, HM plays a vital role in predicting the intentions for technology use (Venkatesh et al. 2012).

Yang (2010) found in his empirical study that hedonic aspects are critical determinants of consumer use of m-shopping services. Yang (2010) exerts that hedonic performance expectancy is to be gained through the joy of using m-shopping functions and features, as well as communicating with others through m-shopping services. However, Lewis et al. (2013) found using partial least squares that HM do not positively influence the intention to use classroom technology, based on a survey conducted on instructors in Southeastern University in the United States of America.

2.1.7 Price Value (PV)

PV is the trade-off between the cost paid for using the technology and the perceived benefits received (Dodds, Monroe & Grewal, 1991). Venkatesh et al. (2012) highlights that PV in consumer decision making regarding technology use is an important factor influencing BI which is tested using PLS. Prata, Moraes & Quaresma (2012) collected user information about search, purchase and evaluation process in mobile apps store usage in Brazil via questionnaire and discovered that mobile apps price is the main reason to buying an app as it was perceived to be expensive. Furthermore, Munnukka (2004) conducted quantitative postal survey to customers of TeliaSonera's mobile services in Finland and discovered that PV has an influence over consumer use of mobile services by testing the result with MLR.

However, Chong (2013) conducted a study via survey questionnaire regarding the cost that affects the intention to adopt m-commerce among

users in China. SEM revealed that the cost related to downloading m-commerce apps negatively influence adoption intentions. Toh, Marthandan, Chong, Ooi & Arumugam (2009) asserted using multiple regression analysis have identified that perceived cost negatively influences the intention to use m-commerce among Malaysian users.

2.1.8 Habit (HT)

Habit is the extent that individuals tend to execute behaviours automatically (Limayem et al. 2007). Venkatesh et al. (2012) discovered that habit directly and indirectly effects on BI to use technology. It was found that increased experience in usage lead to habitual technology use. Liao, Palvia and Lin (2006), performed a postal survey in Taiwan and targeted undergraduate and graduate students as well as company employees and found using SEM that habit brings influences the continuance intention to use e-commerce.

Moreover, Pahnila, Siponen and Zheng (2011) carried out a questionnaire targeted on students of University of Shanghai, China and noticed that habit influences the use of Tao Bao examined using Smart partial least square SEM technique. To further support this theory, Lewis et al. (2013) found that habit positively influenced the intention to use classroom technology.

2.2 Review of Relevant Theoretical Models

The unified theory of acceptance and use of technology (UTAUT) is a unified model formulated by Venkatesh, Morris, Davis and Davis in 2003. It was developed by comparing empirical and conceptual differences of eight prominent models (Venkatesh et al. 2003) shown in Table 2.1. UTAUT provides a unified view to explain user acceptance of new technology so that researchers no longer need to "pick and choose" one model while ignoring the contributions of other models (Venkatesh et al. 2003). According to Lewis, Fretwell, Ryan and Parham (2013), this model acts as a baseline which has been applied to research on many organisational technologies.

Table 2.1: Models and Elements of Individual Acceptance

Author & Year	Models and Theories	Elements
Fishbein & Ajzen (1975)	Theory of Reasoned Action (TRA) to measure performance and behavioural intention.	Attitude Subjective Norm
Venkatesh & Davis (2000)	Technology Acceptance Model 2 (TAM 2) which is an extended TAM.	Perceived Usefulness Perceived Ease Of Use Subjective Norm Experience Voluntariness Image Job Relevance Output Quality Result Demonstrability
Davis et al. (1992)	Motivational Model (MM) to describe behaviour of technology adoption and use.	Motivation (Extrinsic And Intrinsic)

Ajzen (1991)	Theory of Planned Behaviour (TPB) to determine behaviour and intention.	Attitude Subjective Norm Perceived Behavioural Control
Taylor & Todd (1995)	Combined TAM and TPB	Perceived Usefulness Perceived Ease Of Use Attitude Subjective Norm Perceived Behavioural Control
Thompson et al. (1991)	Model of PC Utilization (MPCU) to determine behaviour of PC usage.	Social Factors Affect Perceived Consequences Facilitating Conditions Habits
Rogers (1962)	Innovation Diffusion Theory (IDT)	Relative Advantage Compatibility Complexity Observability Trialability Image Voluntariness Of Use
Bandura (1986)	Social Cognitive Theory (SCT) to determine usage of information systems.	Encouragement Of Others Use Of Others Support Self-Efficacy Performance Outcome Expectations Personal Outcome Expectations Affect

Source: Developed for this research

In 2012, Venkatesh extended UTAUT to pay specific attention to the consumer use context instead of its original purpose which was technology acceptance and use of employees (Venkatesh et al. 2012). UTAUT was extended by including Hedonic Motivation, Price Value and Habit. From this, UTAUT2 has improved the variance of behavioural intention by 18% use of technology by 12% (Venkatesh et al. 2012). The definitions of the UTAUT2 elements are represented in Table 2.2.

Table 2.2: Definitions of the UTAUT2 Elements

Elements	Definition	Papers
Performance Expectancy (PE)	Similar to TAM's perceived usefulness, it is the perception of individuals that using the system will improve their performance. It is the benefits received from using the technology in performing activities.	Min, Ji & Qu (2008); Jambulingam (2013) Venkatesh et al. (2012)
Effort Expectancy (EE)	It is the easiness in using a technology.	Venkatesh & Brown (2001) as cited in Venkatesh et al. (2011)
Social Influence (SI)	The perception of an individual where significant others such as relatives and peers believes the individual should adopt the technology.	Fishbein and Ajzen (1975) as cited in Leong, Hew, Tan, and Ooi (2013)
Facilitating Conditions (FC)	The perception of an individual that technical and organisational infrastructure exists to support the use of technology.	Venkatesh et al. (2003)
Hedonic Motivation (HM)	The experience of fun or pleasure when using a technology. The perceived enjoyment when using a technology, despite the performance consequences that may be expected.	Brown and Venkatesh (2005) Davis, Bagozzi, and Warshaw (1992)

Price Value (PV)	The trade-off between the cost of using the technology and the perceived benefits.	Dodds, Monroe, and Grewal (1991)
Habit (HT)	Automatic behaviours performed due to learning. It is a natural behaviour of a person. Viewed in two different ways: (1) As an earlier behaviour. (2) As an automatic behaviour	Limayem et al. (2007) Kim and Malhotra (2005)

Source: Developed for this research

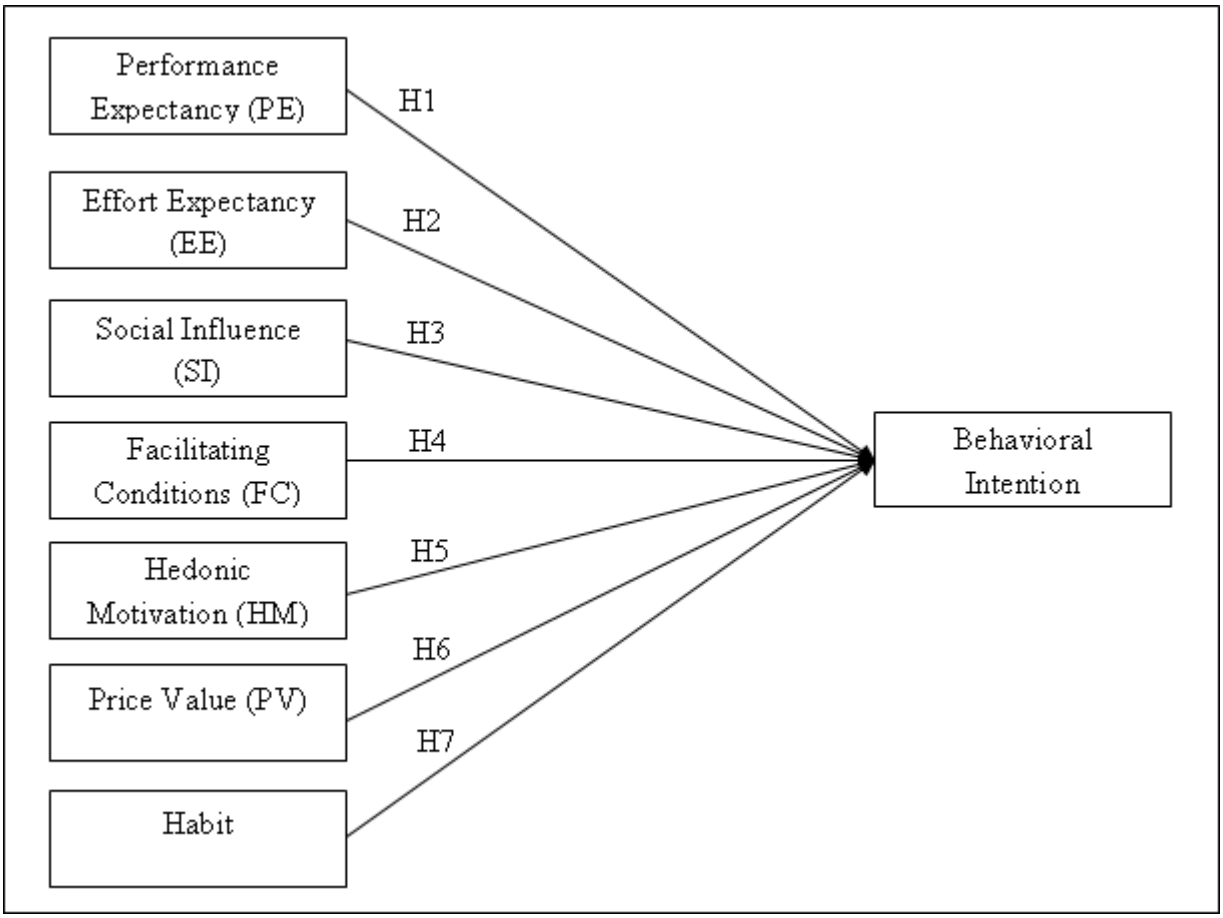
Since UTAUT2 was introduced in 2012, there is limited research in the UTAUT2 implementation literature. Lewis et al. (2013) employed the UTAUT2 model to address the adoption of information technology in the higher education classrooms of United States. They found that PE, EE, SI and HT are significant factors in the context of instructors' use of technology for classroom purposes. Ally and Gardiner (2012) applied the UTAUT2 in their conceptual paper. They also integrated the TAM model and developed new variables to specifically explain individuals' behavioural intentions towards the use of smart mobile devices. Their focus group study was postgraduate students in Australia.

Therefore, this study will apply all the seven elements in the UTAUT2 model to determine whether it influences the behavioural intention of consumers to adopt mobile apps. As this unified theory is based on prominent models which focus on the context of consumer use of technology, it will be able to further validate the extended UTAUT model in Malaysia.

2.3 Proposed Conceptual Framework

After reviewing the UTAUT2 model, Figure 2.1 shows the proposed conceptual framework of this study.

Figure 2.1: UTAUT2 Model



Adapted from: Venkatesh et al. (2012). Consumer acceptance and use of information technology: Extending the unified theory of acceptance and use of technology. *MIS Quarterly, 36*(1), 157-178.

2.4 Hypotheses Development

Hence, the following hypotheses are developed:

H1: PE influences the behavioural intention to adopt mobile apps.
H2: EE influences the behavioural intention to adopt mobile apps.
H3: SI influences the behavioural intention to adopt mobile apps.
H4: FC influences the behavioural intention to adopt mobile apps.
H5: HM influences the behavioural intention to adopt mobile apps.
H6: PV influences the behavioural intention to adopt mobile apps.
H7: HT influences the behavioural intention to adopt mobile apps.

2.5 Conclusion

This chapter reviews past studies and presents the theoretical foundation of the UTAUT2 model. Lastly, a conceptual framework is proposed and the hypotheses of this study are developed. The following chapter will discuss on the methodology of this research in testing the mentioned hypotheses.

CHAPTER 3: METHODOLOGY

3.0 Introduction

This chapter discusses the research design, population and sampling procedures of this study. It also explains the data collection methods, variables and measurements as well the techniques used to analyse the data in order to test the hypotheses developed in Chapter 2.

3.1 Research Design

A quantitative survey is implemented to examine users' behavioural intention to adopt mobile apps using the UTAUT2 elements of PE, EE, SI, FCs, HM, PV and HT. The primary research methodology for this study is survey. According to Glasow (2005), a survey is used to quantitatively describe the relationship among variables of a population and findings of a sample can be used to generalised back to the population.

A cross-sectional study is conducted for this research. According to Olsen and George (2004), the data collected in a cross-sectional study either on the whole population or subset selected can answer research questions of interest. Also, the information collected explains the situation at only one point in time which is appropriate in this study (Olsen et al. 2004).

3.2 Data Collection Method

3.2.1 Primary Data

The collection of data for this research will be through structured questionnaires. It is a set of questions used to gather information from individuals with closed-ended type of questions (Kothari, 2004). An advantage of using questionnaires is that it can cover a large sample at a modest cost and representative of its population (Akbayrak, 2000). This research uses self-administered questionnaires because it reduces biasing error caused by the interviewers' characteristics and skills (Phellas, Bloch & Seale, 2011).

3.3 Sampling Design

3.3.1 Target Population

In understanding consumer adoption intention of mobile apps in Malaysia, the target population for this study are the young Malaysian users of smartphone devices. Younger users are targeted because they are more likely to use advanced mobile phone services, commonly acquiring the latest technology of mobile phones (Islam et al. 2013) and also possessing the IT knowledge for adopting mobile apps. Furthermore, the users of smartphones are targeted because they are more likely to adopt mobile apps than individuals who do not have smartphones (Leong et al. 2013a).

3.3.2 Sampling Frame and Sampling Location

A sample is chosen to from a population in order to make appropriate general conclusions (Barreiro & Albamdoz, 2001). A sample is drawn from the biggest private university in Perak, Malaysia. The targeted respondents come from various states of the country, comprising of different races, religions and backgrounds. Thus, it is safe to assume that the sample would be a good representation of the theoretical population of this study (Leong et al. 2013a).

3.3.3 Sampling Elements

The students of Universiti Tunku Abdul Rahman (UTAR), Kampar, are the respondents of the study. Since this research targets younger smartphone users, university students are selected because the age bracket is more open to adopting new ICTs (Yang, 2010).

3.3.4 Sampling Technique

Since the actual sampling frame is unknown, convenience sampling is chosen to carry out the survey (Leong et al. 2013a). Convenience sampling is a more practical and quick sampling method rather than a true random or stratified random sample (Weir & Jones, 2008). Questionnaires were randomly distributed to users at different faculties. A criterion for selecting respondents is set, that is respondents are familiar with using mobile apps.

3.3.5 Sampling Size

Based on the recommendations of Hinkin (1995), item-to-response ratios should be used for an ideal sample size using 1:10 for each set of scales to

be factor analysed. Since the questionnaire is adapted from Venkatesh et al. (2012), a total of 28 items using the ratio of 1:10 will yield 280 respondents. Thus, 300 questionnaires were distributed in this research.

3.4 Research Instruments

Self-administered questionnaires which are paper-based were distributed face to face to users in UTAR at different faculties. According to Akbayrak (2000), questionnaires in which respondents fill in themselves assure a high response rate and are very efficient in terms of researchers' time and effort. Each respondent took approximately 10 minutes to answer the questionnaire, and every questionnaire was immediately collected after it was answered. The duration of the survey took around 2 weeks complete.

Initially, a pilot test was conducted to identify weaknesses in the questionnaires and also of the survey techniques (Kothari, 2004). According to Monette, Sullivan and DeJong (2002), twenty participants for the pilot test are sufficient to test the validity of the survey's content. Thus, thirty participants were selected for the pilot study after having validated the questionnaire. The pilot test was conducted in Block H of UTAR, Kampar.

Subsequently, reliability and normality test is conducted on the pilot sample. The Cronbach's alpha values of the variables in Table 3.1 are within the range of 0.784 to 0.917 with HT yielding the highest value among all other variables. As illustrated in the table below, it is proved that the reliability of the pilot test has been met.

Table 3.1: Reliability Statistics of Pilot Test

Variables	Constructs	Number of Items	Cronbach's Alpha
IV1	PE	5	0.805
IV2	EE	5	0.821
IV3	SI	5	0.784
IV4	FC	5	0.803
IV5	HM	7	0.838
IV6	PV	4	0.797
IV7	HT	5	0.917
DV	BI	5	0.860

Source: Developed for the research

Results of the normality test in Table 3.2 shows that the skewness values of the variables are within the range of ±2. However, the kurtosis value for PE is slightly above the recommended level, but it was included in the construct to avoid losing information (Pahnila et al. 2011) and because the reliability values were clearly above the threshold. In short, the reliability and normality results are acceptable, thus, collection of data can be carried out.

Table 3.2: Normality Statistics (Pilot Test)

Constructs	Items	Skewness	Kurtosis
PE	PE1	-1.638	4.294
	PE2	-1.195	1.339
	PE3	-0.718	1.761
	PE4	-1.232	3.708
	PE5	0.135	0.473

EE	EE1	-0.690	0.513
	EE2	-0.655	1.141
	EE3	0.226	-0.498
	EE4	-0.291	-0.209
	EE5	-0.050	-0.699
SI	SI1	-0.283	-0.877
	SI2	-0.869	1.509
	SI3	-0.003	0.315
	SI4	-1.270	3.002
	SI5	-1.672	4.085
FC	FC1	0.177	-0.284
	FC2	0.000	-0.066
	FC3	0.525	0.925
	FC4	0.499	-0.022
	FC5	-0.916	2.938
HM	HM1	0.289	-0.403
	HM2	0.369	-0.441
	HM3	-0.121	-0.438
	HM4	-0.087	-0.093
	HM5	-0.444	0.885
	HM6	-0.115	0.593
	HM7	-0.093	1.354

PV	PV1	-0.575	0.096
	PV2	-0.788	1.481
	PV3	-0.682	1.582
	PV4	0.113	-1.103
HT	HT1	-0.287	-0.250
	HT2	-0.339	-0.412
	HT3	-0.175	-0.547
	HT4	-0.572	0.220
	HT5	0.264	-0.728
BI	BI1	0.655	-0.734
	BI2	0.198	-0.007
	BI3	0.127	-1.027
	BI4	-0.164	-0.623
	BI5	0.364	-0.638

Source: Developed for the research

3.5 Constructs Measurement

The items of the questionnaire were adapted from Venkatesh et al. (2012) and consist of 28 items, namely 25 items for IV1 to IV7 and 3 items for DV. This study adapts the elements from this previous empirical study to validate the scale used (Luarn & Lin, 2005). Besides that, the questionnaires include four demographic questions about their gender, age, race and personal income.

These items were measured using a 7-point Likert scale, ranging from “strongly disagree” to “strongly agree” (Venkatesh et al. 2012). The survey methods were

revised as to fulfil the requirements of the current study to examine whether behavioural intention affects the adoption of mobile apps.

3.6 Data Processing

In total, 300 questionnaires were distributed to users in UTAR, Kampar. All the questionnaires were collected and used to conduct data analysis, resulting in a response rate of 100 per cent. The data collected were entered into SAS Enterprise Guide 5.1. The data was rechecked for consistency so as to minimise errors in keying in the data.

3.7 Data Analysis

The data collected will be subject to descriptive analysis and inferential analysis using SAS which will be presented in the following chapter.

3.7.1 Descriptive Analysis

The demographic profile of target respondents (gender, age, ethnicity, and education pursued) will be described in frequency and percentage using tables and charts. The central tendencies of measurement of every construct in the questionnaire will be calculated and presented.

3.7.2 Scale Measurement

The data collected will then undergo reliability test and normality test. The reliability test was conducted to determine the extent to which the data or measurement is consistent (Hernon & Swartz, 2009). According to Hair,

Anderson and Black (2007), the Cronbach's Alpha values must be more than 0.7 to ensure that variables are reliable.

Normality test was conducted to ensure that the data are normally distributed. The common rule-of-thumb for normality is skewness and kurtosis to be within the range of -2 and +2 for the data to be normally distributed (Garson, 2012; George & Mallery, 2005).

3.7.3 Inferential Analysis

In the process of fitting regression models, the classic problem of multicolliearity will arise (Lin, 2006). It occurs when independent variables in these models are correlated, presenting insignificant predictors of a dependent variable (Grapentine, 1997). Therefore, Pearson's Correlation will be employed on the data set to evaluate the correlation between the independent variables (PE, EE, SI, FC, HM, PV and HT) and the dependent variable (BI). Multicollinearity exists when the correlations are higher than 0.90 (Hair, Black & Babin, 2010).

Consequently, MLR will be used to seek for linear relationship (Yan & Su, 2009) between the dependent variable and the independent variables of this study. According to Hair, Babin, Money and Samoel (2003), the MLR test is significant when the p-value is less than 0.05. The coefficient of determination, R^2, represents the percentage of how well the independent variables can explain the variations in the dependent variable (Zikmund 1991 as cited in Munnukka 2004).

3.8 Conclusion

This chapter discussed the research design, sampling procedures, data collection, and measurement of variables. The interpretations of the results based on data analysis will be discussed and presented in the next chapter.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

The results of descriptive analysis, inferential analysis and scale measurement will be discussed and presented in this chapter.

4.1 Descriptive Analysis

4.1.1 Demographic Profile of Respondents

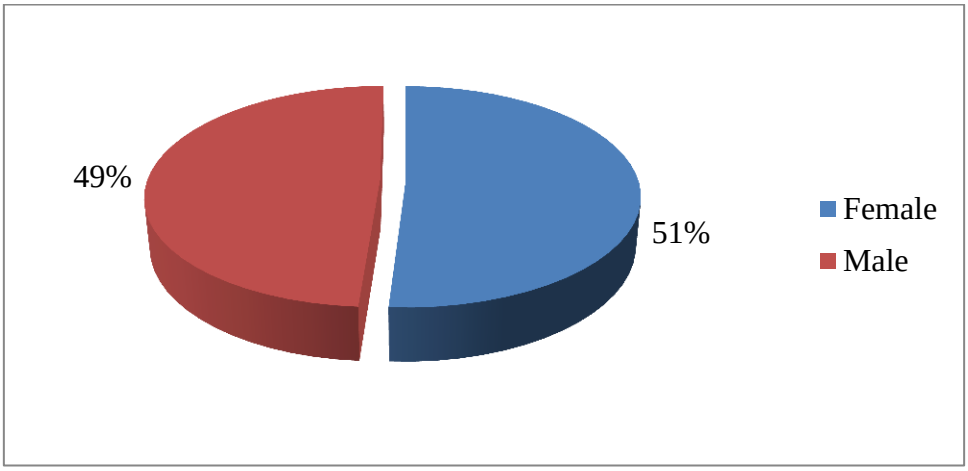
This section describes the demographic profile of 300 respondents collected from the survey, resulting in a response rate of 100 per cent. Closed-ended questions were used in the questionnaire and thus, choices of answers in the questionnaires are limited.

Table 4.1: Gender of Respondents

Category	Frequency	Percent (%)
Female	153	51.0
Male	147	49.0
Total	280	100.0

Source: Developed for the research

Figure 4.1: Gender of Respondents



Source: Developed for the research

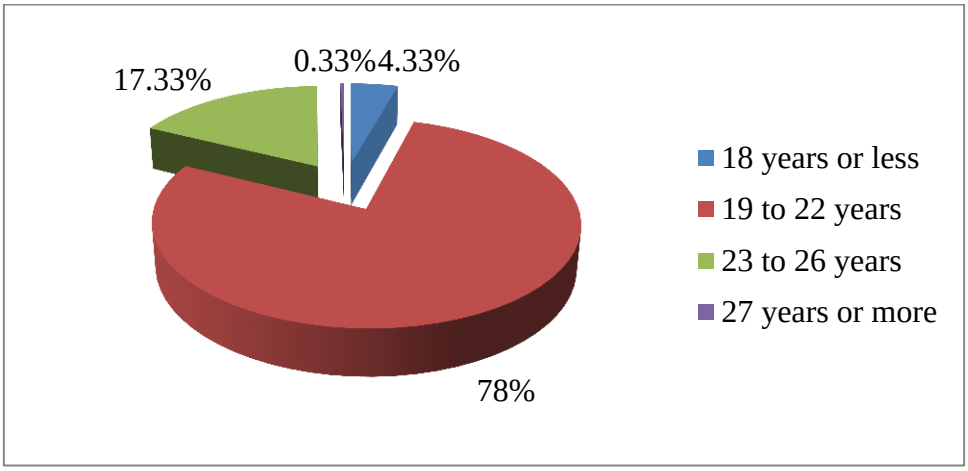
As shown in Table 4.1 and Figure 4.1, out of 300 respondents, 153 are females (51.0%) and 147 are males (49.0%). The number of female respondents is higher than male respondents by 2%. Thus, there is not a big difference between the number of female and male respondents in UTAR.

Table 4.2: Age of Respondents

Age Group	Frequency	Percent (%)
18 years or less	13	4.33
19 to 22 years	234	78.0
23 to 26 years	52	17.33
27 years or more	1	0.33
Total	300	100.0

Source: Developed for the research

Figure 4.2: Age of Respondents



Source: Developed for the research

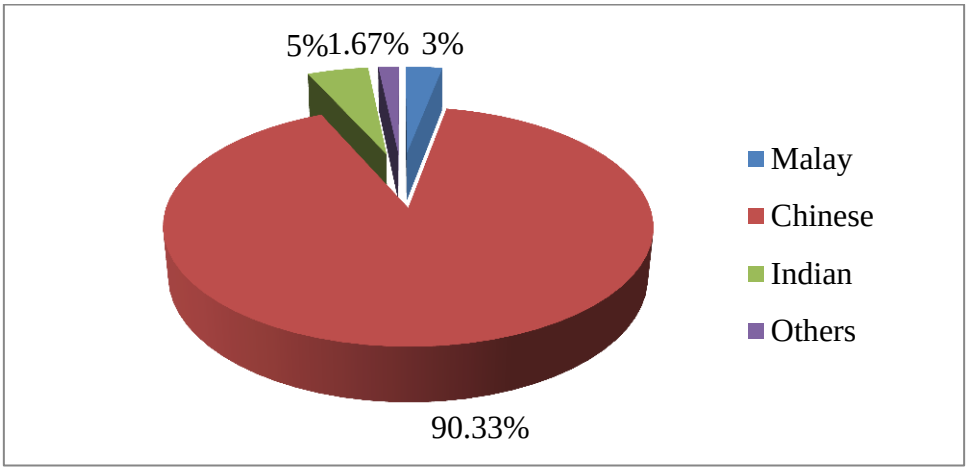
Table 4.2 and Figure 4.2 above presents the distribution of respondents according to four main age groups which are 18 years or less, 10 to 22 years, 23 to 26 years, and 27 years or more. Here, there are 13 (4.33%) respondents who are 18 years or less, 234 (78%) respondents who are 19 to 22 years, 52 (17.33%) respondents who are 23 to 26 years, and only 1 (0.33%) respondent who is 27 years or more. This shows that a majority of respondents are young people aged from 19 to 22 years.

Table 4.3: Ethnicity of Respondents

Ethnicity	Frequency	Percent (%)
Malay	9	3.0
Chinese	271	90.33
Indian	15	5.0
Others	5	1.67
Total	300	100.0

Source: Developed for the research

Figure 4.3: Ethnicity of Respondents



Source: Developed for the research

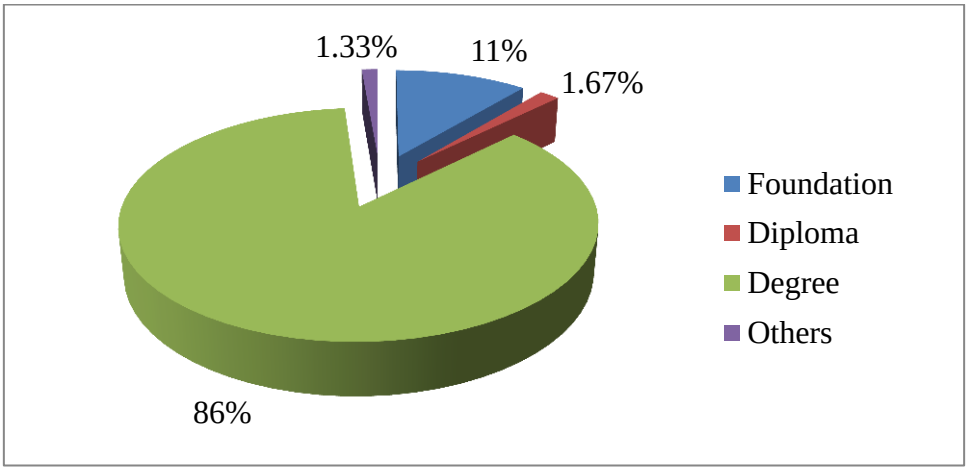
From Table 4.3 and Figure 4.3 above, there are 4 ethnicity groups which are Malay, Chinese, Indian, and Others. Based on the results, there are 9 (3.0%) Malays, 271 (90.33%) Chinese, 15 (5.0%) Indians, and only 5 (1.67%) of other ethnicities such as Punjabis, Arabs and Africans who were respondents of the research. This shows that UTAR has a majority of Chinese students and the chances of selecting Chinese respondents to answer the questionnaires are higher.

Table 4.4: Education Level of Respondents

Education Level	Frequency	Percent (%)
Foundation	33	11.0
Diploma	5	1.67
Degree	258	86.0
Others	4	1.33
Total	300	100.0

Source: Developed for the research

Figure 4.4: Education Level of Respondents



Source: Developed for the research

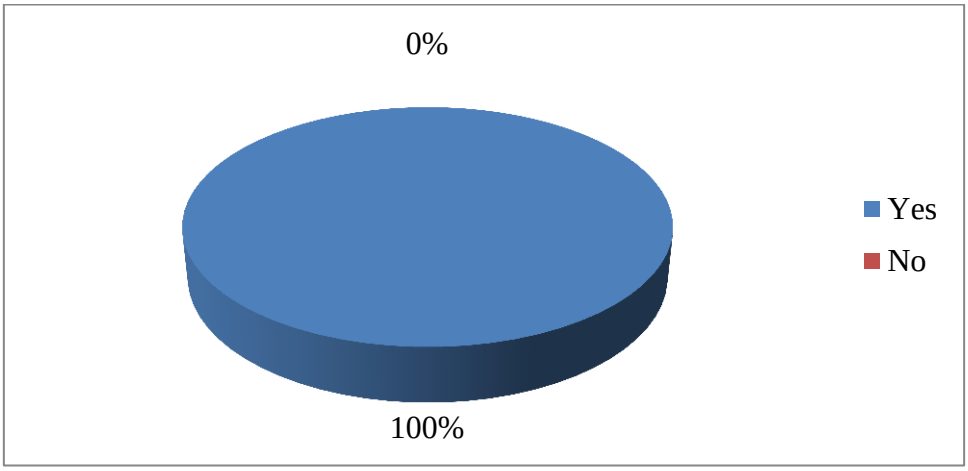
Stated in Table 4.4 and Figure 4.4 above, there are 4 different education levels which are foundation, diploma, degree and others. Here, 33 (11.0%) respondents are currently pursuing foundation studies, 5 (1.67%) are currently pursuing diploma, 258 (86%) are currently pursuing degree, and only 4 (1.33%) are currently pursuing others such as Masters. Thus, a majority of respondents are currently pursuing a degree in UTAR.

Table 4.5: Respondents' Previous Use with Mobile Apps

Used Mobile Apps Before?	**Frequency**	**Percent (%)**
Yes	300	100.0
No	0	0
Total	300	100.0

Source: Developed for the research

Figure 4.5: Respondents' Previous Use with Mobile Apps



Source: Developed for the research

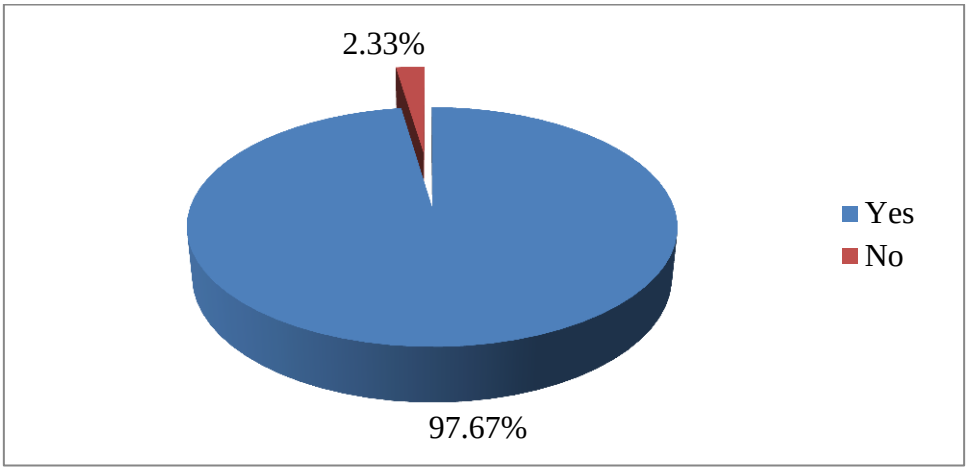
As resulted in Table 4.5 and Figure 4.5 above, 300 (100.0%) respondents have used mobile apps and no respondents have not used mobile apps before.

Table 4.6: Mobile Apps on Respondents' Mobile Device

Have Mobile Apps?	Frequency	Percent (%)
Yes	293	97.67
No	7	2.33
Total	300	100.0

Source: Developed for the research

Figure 4.6: Mobile Apps on Respondents' Mobile Device



Source: Developed for the research

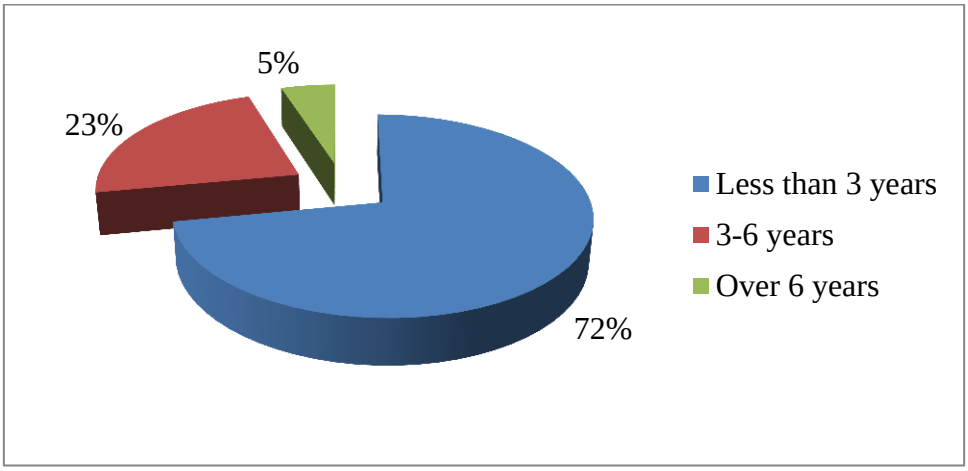
According to Table 4.6 and Figure 4.6 above, 293 (97.67%) respondents have mobile apps in their mobile devices and only 7 (2.33%) of them do not have mobile apps. This shows that a large majority respondents own mobile apps in their devices.

Table 4.7: Respondents' Experience with Mobile Apps

Years of Experience	Frequency	Percent (%)
Less than 3 years	216	72.0
3 to 6 years	69	23.0
Over 6 years	15	5.0
Total	300	100.0

Source: Developed for the research

Figure 4.7: Respondents' Experience with Mobile Apps



Source: Developed for the research

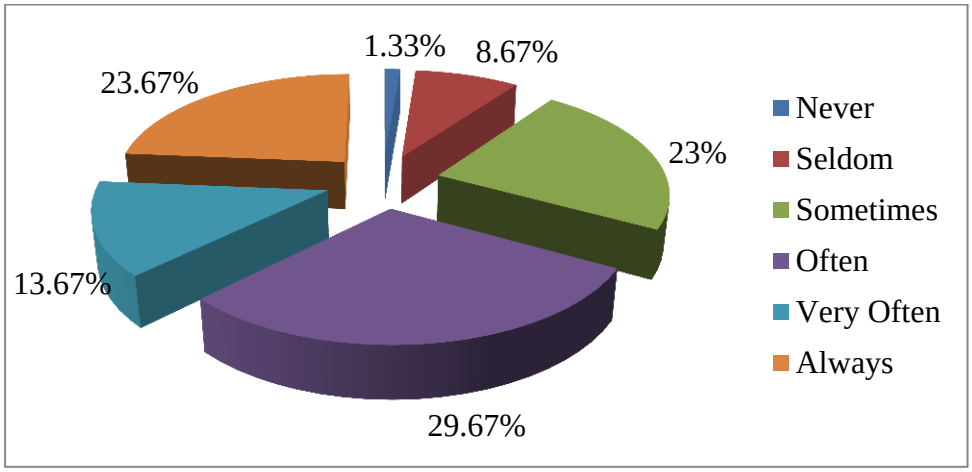
From the results in Table 4.7 and Figure 4.7 above, 216 (72%) respondents have less than 3 years of experience with mobile apps, 69 (23%) respondent have 3 to 6 years of experience with mobile apps and 15 (5%) respondents have over 6 years of experience with mobile apps. Thus, a majority of them only started using mobile apps less than 3 years ago.

Table 4.8: Respondents' Frequency of Mobile Apps Use

Frequency of Use	Frequency	Percent (%)
Never	0	0.0
Seldom	27	9.0
Sometimes	69	23.0
Often	91	30.3
Very often	42	14.0
Always	71	23.7
Total	300	100.0

Source: Developed for the research

Figure 4.8: Respondents' Frequency of Mobile Apps Use



Source: Developed for the research

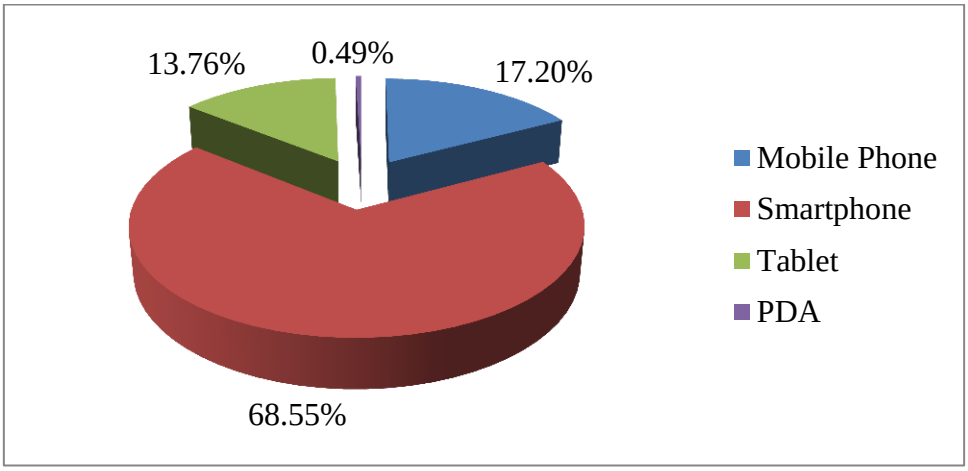
As stated in Table 4.8 and Figure 4.8 above, there are no respondents who have never used mobile apps, 27 (9.0%) who seldom use mobile apps, 69 (23%) who sometimes use mobile apps, 91 (30.33%) respondents who often use mobile apps, 42 (14.0%) respondents who very often use and 71 (23.67%) respondents who always use mobile apps. From here, the highest number of respondents often use mobile apps.

Table 4.9: Types of Mobile Devices Owned by Respondents

Type of Mobile Device	Frequency	Percent (%)
Mobile Phone	70	17.2
Smartphone	279	68.6
Tablet	56	13.8
Personal Digital Assistant (PDA)	2	0.5
Total	407	100.0

Source: Developed for the research

Figure 4.9: Types of Mobile Devices Owned by Respondents



Source: Developed for the research

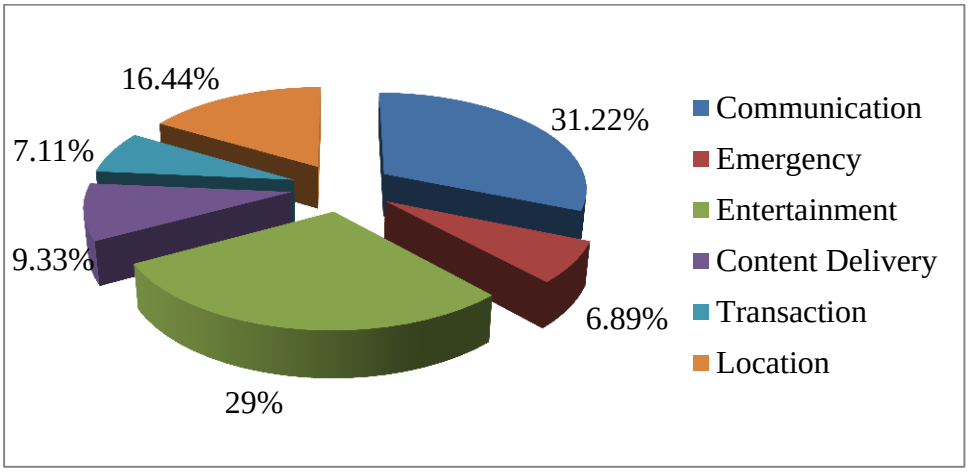
There are four main types of mobile devices which are mobile phone, smartphone, tablet, and PDA where respondents can choose more than one device depending on which they own. Based on the results shown in Table 4.9 and Figure 4.9, 70 respondents (17.20%) own mobile phones, 279 (68.55%) own smartphones, 56 (13.76%) own tablets and only 2 (0.49%) own PDAs. With this, a majority of respondents own smartphones.

Table 4.10: Types of Mobile Apps Used by Respondents

Types of Mobile Apps	Frequency	Percent (%)
Communication	281	31.2
Emergency	62	6.9
Entertainment	261	29.0
Content Delivery	84	9.3
Transaction	64	7.1
Location	148	16.4
Total	900	100.0

Source: Developed for the research

Figure 4.10: Types of Mobile Apps Used by Respondents



Source: Developed for the research

There are six categories of mobile apps which are communication, emergency, entertainment, content delivery, transaction, and location where respondents can choose more than one app depending on usage. Based on the results shown in Table 4.10 and Figure 4.10 above, 281 (31.22%) use communication apps, 62 (6.89%) use emergency apps, 261 (29.0%) use entertainment apps, 84 (9.33) use content delivery apps, 64 (7.11%) use transaction apps, and 148 (16.44%) use location apps. Here, most respondents use mobile apps for communication followed by the second most for entertainment apps.

4.1.2 Central Tendencies Measurement of Construct

Table 4.11 below shows the lowest and highest mean and standard deviation of each of the variables. The mean values of all variables range from 3.4767 to 5.6200. This shows that most of the respondents select disagree, neutral or agree. For standard deviation, all the values are above 1 but less than 1.4594.

Table 4.11: Central Tendencies Measurement

Variables	Constructs	Mean		Standard Deviation (SD)	
		Lowest	Highest	Lowest	Highest
IV1	PE	5.0033	5.5967	0.9775	1.1724
IV2	EE	5.0633	5.3633	1.0331	1.0691
IV3	SI	4.4667	4.9867	1.0099	1.3599
IV4	FC	4.9333	5.1367	0.9229	1.0591
IV5	HM	4.7100	5.6200	0.9505	1.1563
IV6	PV	3.4767	4.2067	1.0299	1.4594
IV7	HT	4.0233	4.7033	1.2546	1.4411
DV	BI	4.9667	5.3767	1.0352	1.1479

Source: Developed for the research

4.2 Scale Measurement

4.2.1 Reliability Test

Table 4.12 shows the Cronbach's coefficient alpha test results. Among the independent variables, Effort Expectancy attained the highest Cronbach's alpha value with 0.9140, while Price Value achieved the lowest value,

which is 0.7487. Cronbach's alpha value closer to 0.9 indicates high reliability and good internal item consistency in the scale (George & Mallery, 2003). Thus, the data collected is highly reliable.

Table 4.12: Reliability Statistics

Variables	Constructs	Number of Items	Cronbach's Alpha
IV1	PE	5	0.869
IV2	EE	5	0.914
IV3	SI	5	0.812
IV4	FC	5	0.804
IV5	PV	7	0.895
IV6	HM	4	0.775
IV7	HT	5	0.901
DV	BI	5	0.907

Source: Developed for the research

4.2.2 Normality Test

Based on Table 4.13, the skewness and kurtosis values of the variables are within the range of $\pm$ 2. The highest skewness value is 0.3474 for SI1 and the lowest skewness value is -0.6363 for SI4. Besides that, the highest kurtosis is 1.3522 for HM4 and the lowest kurtosis is -0.4840 for HM7. The normality results computed shows that the variables are normally distributed as the results of skewness and kurtosis of each item falls between the acceptable ranges.

Table 4.13: Normality Statistics

Constructs	Items	Skewness	Kurtosis
PE	PE1	-0.5686	1.0566
	PE2	-0.1996	0.9312
	PE3	-0.1774	-0.1539
	PE4	-0.3450	0.4681
	PE5	-0.3850	0.7326
EE	EE1	-0.3322	0.8213
	EE2	-0.4514	1.0983
	EE3	-0.3629	1.2297
	EE4	-0.3832	0.8287
	EE5	-0.3839	1.2765
SI	SI1	0.3474	0.1843
	SI2	-0.3575	0.8287
	SI3	-0.1837	0.3434
	SI4	-0.6363	0.6167
	SI5	-0.4459	0.1752
FC	FC1	0.2100	-0.0469
	FC2	-0.0870	0.2395
	FC3	-0.1321	0.2671
	FC4	-0.3437	0.9659
	FC5	0.1141	0.2563
HM	HM1	-0.2296	-0.0642
	HM2	-0.1212	-0.1229
	HM3	-0.4632	0.2909
	HM4	-0.4641	1.3522
	HM5	-0.0644	0.2400
	HM6	-0.4092	1.0988
	HM7	0.24195	-0.4840

PV	PV1	-0.0301	0.6779
	PV2	-0.0569	0.7467
	PV3	-0.1827	0.9636
	PV4	0.0821	-0.1865
HT	HT1	-0.2734	0.3361
	HT2	-0.2232	-0.0181
	HT3	-0.1537	0.0845
	HT4	-0.6137	0.9415
	HT5	-0.3487	0.2674
BI	BI1	-0.3676	1.3272
	BI2	-0.3472	0.6681
	BI3	-0.1807	0.5074
	BI4	-0.2096	0.7537
	BI5	-0.4366	1.3802

Source: Developed for the research

4.3 Inferential Analysis

4.3.1 Multicollineary Test

According to Table 4.14, all the columns do not have correlation value higher than 0.90. Thus, no multicolinearity problem was discovered in this research. Furthermore, the correlation coefficient values ranges from 0.196 to 0.686 which represents a positive correlation. The probability of the correlation coefficient having occurred by chance alone is less the 0.05 ($p < 0.05$). Therefore the relationships between the variables are statistically significant.

Table 4.14: Pearson Correlation Coefficients Matrix

Variable	PE	EE	SI	FC	HM	PV	HT	BI
PE	1.0000							
EE	0.4999	1.0000						
SI	0.3769	0.3215	1.0000					
FC	0.4912	0.5877	0.3844	1.0000				
HM	0.5408	0.4795	0.4975	0.5225	1.0000			
PV	0.1619	0.0573	0.3018	0.0819	0.1609	1.0000		
HT	0.4686	0.3574	0.4874	0.3520	0.5195	0.1727	1.0000	
BI	0.5419	0.4514	0.4586	0.4127	0.5954	0.1965	0.6861	1.0000

Source: Developed for the research

4.3.2 Multiple Linear Regression (MLR)

Based on Table 4.15 below, R^2 of 0.5825 indicates that 58.25% of the variation in the dependent variable (BI) can be explained by all the independent variables (PE, EE, SI, FC, HM, PV and HT). Besides that, the remaining 41.75% of variation can be explained by other factors which were not taken into account in this study.

Table 4.15: Model Summary

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
1	.6228	.5825	.5725	.3879

Source: Developed for the research

The ANOVA table below is used to determine whether there is a significant difference in the treatment effects under study (Richter, 2012). Table 4.16 shows that the F value is 58.19 with 7 and 292 degrees of freedom (df) and a probability of occurrence by chance alone is less than 0.001 if there is no significant effect between the variables.

Table 4.16: ANOVA of Multiple Linear Regression for Behavioural Intention

	Sum of Squares	**df**	**Mean Square**	**F**	**Pr > F**
Model	157.9912	7	22.5702	58.19	<.0001
Error	113.2520	292	0.3879		
Total	271.2432	299			

Source: Developed for the research

According to Richter (2012), if the computed F ratio is higher than the F ratio from the F table, the differences among the means are significant. The calculated F value is 58.19 and the value obtained from the F table is 3.26, thus can be concluded that there is a significant difference among the means. Therefore, the independent variables (PE, EE, SI, FC, HM, PV and HT) can be used to explain the dependent variable (BI) [$F = 58.19$, $p < .001$].

Table 4.17: Parameter Estimates of Constructs

Construct	df	Parameter Estimate	Standardised Estimate	Standard Error	t	Pr > |t|
Intercept	1	.3903	0	.3166	1.23	.2187
PE	1	.1659	0.1481	.0556	2.98	.0031
EE	1	.1119	0.1073	.0519	2.16	.0318
SI	1	.0380	0.0349	.0519	0.73	.4651
FC	1	- .0101	-0.0079	.0654	-0.15	.8774
HM	1	.2472	0.2113	.0615	4.02	<.0001
PV	1	.0492	0.0454	.0432	1.14	.2560
HT	1	.3709	0.4464	.0398	9.32	<.0001

Source: Developed for the research

According to Table 4.17, the results demonstrate that PE, EE, HM and HT have an influence on the adoption intention as the p-value is below 0.05. This means that H1, H2, H5 and H7 are supported. The value of standardised estimate of PE, EE, HM and HT is 0.4464, 0.2113, 0.1481 and 0.1073 respectively. This indicates that HT is the strongest predictor with positive influence on behavioural intention to adopt mobile apps, followed by HM, PE, and EE.

However, SI, FC and PV does not have an influence on the adoption intention because the p-value of these constructs are greater than 0.05. Therefore, H3, H4 and H6 are not supported. The value of standardised estimate of SI, PV and FC is 0.0349, 0.0454 and -0.0079 respectively. The negative value of FC signifies that it negatively influences the behavioural intention to adopt mobile apps.

Subsequently, the regression equation is written as:
Behavioural Intention = 0.3903 + 0.1659 PE + 0.1119 EE + 0.0380 SI – 0.0101 FC + 0.2472 HM + 0.0492 PV + 0. 3709 HT

4.4 Conclusion

This chapter described the demographic profile of the respondents and the results of data analysis. The following chapter will summarise the results found in this chapter, and discuss the major findings, limitations, recommendations and the implications of this study.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0 Introduction

This chapter summarises statistical analysis and major findings based on the results in Chapter 4. The implications, limitation and recommendations for future research will be discussed, along with an overall conclusion of this research project.

5.1 Summary of Statistical Analysis

5.1.1 Summary of Descriptive Analysis

Table 5.1: Summary of Demographic Profiles

Profile	Category	Frequency	Percentage (%)
Gender	Female	153	51.0
	Male	147	49.0
Age Group	18 years or less	13	4.33
	19 to 22 years	234	78.0
	23 to 26 years	52	17.33
	27 years or more	1	0.33
Ethnicity	Malay	9	3.0
	Chinese	271	90.33
	Indian	15	5.0
	Others	5	1.67

Education level	Foundation	33	11.0
	Diploma	5	1.67
	Degree	258	86.0
	Others	4	1.33
Experience with Mobile Apps	Yes	300	100.0
	No	0	0.0
Mobile Apps on Mobile Device	Yes	293	97.67
	No	7	2.33
Experience with Mobile Apps	Less than 3 years	216	72.0
	3 to 6 years	69	23.0
	Over 6 years	15	5.0
Frequency of Mobile Apps Use	Never	0	0.0
	Seldom	27	9.0
	Sometimes	69	23.0
	Often	91	30.3
	Very often	42	14.0
	Always	71	23.7
Types of Mobile Device Owned	Mobile Phone	70	17.2
	Smartphone	279	68.6
	Tablet	56	13.8
	PDA	2	0.5
Types of Mobile Apps Used	Communication	281	31.2
	Emergency	62	6.9
	Entertainment	261	29.0
	Content Delivery	84	9.3
	Transaction	64	7.1
	Location	148	16.4

Source: Developed for the research

As shown in Table 5.1, the demographic profile of respondents shows a minimal difference between the number of female and male respondents. Majority of the respondents are between the age of 19 to 22 years, Chinese and currently pursuing a degree in UTAR. Almost all the respondents have used mobile apps before and have apps on their mobile devices. Besides that, nearly all respondents have less than 3 years of experience with mobile apps and often use mobile apps. A large majority of the respondents own a smartphone and mainly use mobile apps for communication.

5.1.2 Summary of Inferential Analysis

Table 5.2: Summary of Inferential Analysis

Hypotheses	**Standardised Estimate**	**Multiple Linear Regression**	
	Result	**Result**	**Remarks**
H1: PE influences the behavioural intention to adopt mobile apps.	0.1481	0.0031	Supported
H2: EE influences the behavioural intention to adopt mobile apps.	0.1073	0.0318	Supported
H3: SI influences the behavioural intention to adopt mobile apps.	0.0349	0.4651	Not Supported
H4: FC influences the behavioural intention to adopt mobile apps.	-0.0079	0.8774	Not Supported
H5: HM influences the behavioural intention to adopt mobile apps.	0.2113	<0.0001	Supported

H6: PV influences the behavioural intention to adopt mobile apps.	0.0454	0.2560	Not Supported
H7: Habit influences the behavioural intention to adopt mobile apps.	0.4464	<0.0001	Supported

Source: Developed for the research

According to Table 5.2, the MLR results show that PE, EE, HM and HT influence BI. Thus, the alternative hypotheses H1, H2, H5, and H7 are supported. However, the alternative hypotheses H3, H4 and H6 are not supported as SI, FC and PV do not influence BI. The standardised estimates results indicate that HT is the strongest predictor with positive influence on behavioural intention to adopt mobile apps, followed by HM, PE, EE, SI, PV and FC.

5.2 Discussion of Major Findings

5.2.1 The Relationship between Performance Expectancy and Behavioural Intention to Adopt Mobile Apps

In this research, PE refers to the extent to which users believe using mobile apps will help improve their performance. PE has been verified to positively influence the BI to adopt mobile apps. This aligns with the initial findings of Sun et al. (2010), Leong et al. (2013b), and AbuShanab et al. (2007). Users find that mobile apps are advantageous and increases productivity in performing activities in their daily life which justifies the usefulness of mobile apps.

Moreover, the results of this study suggest that usefulness (PE) is more important than ease of use (EE). This means that no matter how easy it is to use the app, it will not be adopted if it is not deemed useful. Users will adopt mobile apps when they believe mobile apps are useful to them. Therefore, H_1 is supported.

5.2.2 The Relationship between Effort Expectancy and Behavioural Intention to Adopt Mobile Apps

In this research, EE refers to the extent to which students believe mobile apps are easy to use. EE positively influences BI to adopt mobile apps which is in agreement with Teo et al. (2012), and Tan et al. (2011). Users believe that mobile apps are easy to use, understandable and can become skillful at using them. It can be inferred that when users find it easy to get mobile apps to do what they want, it helps users accomplish things faster. Alternatively, if using mobile apps require great efforts, users may be discouraged from adopting the apps (Tan et al. 2011). Thus, H_2 is supported because the adoption intention is fostered by users' perception of how easy mobile apps are to use.

5.2.3 The Relationship between Social Influence and Behavioural Intention to Adopt Mobile Apps

In this research, SI is the degree to which significant others (relatives and friends) believe that the individual should adopt mobile apps. Results in this study shows that SI does not influence the adoption intention which is supported by Yang (2013) and Lu et al. (2005). Users are not influenced by the opinions, suggestions and recommendations of important others who think they should adopt mobile apps.

Contrary to Yang (2010), users are independent in making adoption decisions and are not influenced by word-of-mouth opinions. This may be

because product reviews or expert opinions features are made available on mobile apps stores. Users can make purchasing decisions based on these reviews without having to consult their family or friends. Hence, H_3 is not supported.

5.2.4 The Relationship between Facilitating Conditions and Behavioural Intention to Adopt Mobile Apps

In this study, FC refers to the degree to which external infrastructure affects students' intention to adopt mobile apps. It does not influence the behavioural intention which is in agreement with Teo et al. (2012) and Jambulingam (2013). However, it is the only variable which yields a negative result in predicting the adoption intention. Users are confident that they have enough resources, knowledge and capabilities to control mobile apps use. As put forth by Islam et al. (2013), the younger population possesses the IT knowledge to use advanced mobile phone services.

Furthermore, when users find mobile apps easy to use, it eliminates the need for support infrastructure. This explains why FC is found to be insignificant in predicting adoption intention because the constructs of PE and EE are present in this study (Venkatesh, 2003). Therefore, H_4 is not supported.

5.2.5 The Relationship between Hedonic Motivation and Behavioural Intention to Adopt Mobile Apps

In this research, HM refers to the fun or pleasure users experience from using mobile apps. Results in this study suggest that HM positively influences the adoption intention which is supported by To et al. (2007), Magni et al. (2010) and Venkatesh et al. (2012). Users experience pleasure, enjoyment and entertainment when using mobile apps. To et al.

(2007) exerts in his study regarding internet shopping that users love to shop due to the enjoyment of the shopping process and not about obtaining the physical objective or completing a mission. For this reason, user's behaviour is driven by the aspiration of being engaged in pleasurable, enjoyable and entertaining activities. Thus, H_5 is supported.

5.2.6 The Relationship between Price Value and Behavioural Intention to Adopt Mobile Apps

In this research, PV refers to whether users view mobile apps are worth its value. The results of this study suggest that PV does not influence the adoption intention which is consistent with the findings of Chong (2013) and Toh et al. (2009). Users believe that the prices of mobile apps do not reflect its relative value because the benefits of apps are not high enough to justify the price. Since the respondents in this study are university students, Chong (2013) believes that undergraduate students are more price sensitive compared to other users. Then again, if the perceived benefits of the app are high, it will influence users to adopt mobile apps. Therefore, H_6 is not supported in this study.

5.2.7 The Relationship between Habit and Behavioural Intention to Adopt Mobile Apps

In this research, HT refers to the automatic behaviour of using mobile apps. The results of this study reveal that HT is the strongest predictor of behavioural intention to adopt mobile apps, and its positive influence is similar to the works of Venkatesh et al. (2012) as well as Liao et al. (2006). Based on the survey, users are addicted to using mobile apps which becomes an involuntary action. Liao et al. (2006) exerts that when the use of mobile apps becomes a routine, habit will become an additional force that increases the behavioural intention to continue using the apps.

Users in this study experience hedonic motivation, which is the second highest predictor of behavioural intention. Due to the prior satisfaction received from using the apps, it fosters their intention to continue using the apps which will eventually lead to unplanned mobile apps use. Such behaviour slowly evolves into habit, where users find that they must use mobile apps. Hence, H_7 is supported in this study.

5.3 Implications of Study

5.3.1 Managerial Implications

The following implications are recommended to business practitioners in the mobile industry to help them assess success factors for developing mobile apps.

The hedonic and habit aspect should be taken seriously because these constructs are the most significant in the adoption intention of mobile apps. Besides creating apps that enhance enjoyment and excitement, app developers should try to constantly reinforce users' habit with value added services and upgrades. Furthermore, app developers can alter users' habit that was cultivated elsewhere by providing greater benefits in their apps than their competitors. The construct PE is found to be more significant than EE in influencing the adoption intention. Therefore, system designers should emphasise the apps' functionality and usability from the customers' perspective apart from designing apps that are easy to access and navigate.

Furthermore, since users make their adoption decisions based on reviews and ratings, mobile apps marketers should remove fake and paid reviews to help users make better adoption decisions. Besides that, although young users find mobile apps easy to use, app developers should still focus on

providing technical support to users who are less technologically advanced. Lastly, mobile marketing practitioners should focus on the real value of their apps by revising their marketing and pricing schemes to attract price-conscious consumers.

5.4 Limitations of the Study

This research has several limitations which should be addressed in future studies. Majority of the respondents in this research are Chinese (90.33%) which cannot be said to represent the population of Malaysia. The respondents are university students, which may raise the question of external validity. According to Pahnila et al. (2011), the average profile of university students does not represent typical purchasers of online products and services. Due to these reasons, generalisability of the result is limited.

Secondly, this study does not explore the "intention to use" but merely on the intention to adopt. This is to establish strong relations between the dependent and independent variables first prior to integrating the usage intention construct. Furthermore, moderators were not incorporated in this research to avoid confusion and misleading findings because the approaches or definitions may be appropriate in some situations and not in others (Sharma, Durand & Gur-Arie, 1981).

A cross-sectional study was used to measure respondents' perceptions and intentions at a point in time. Given that perceptions and intentions change over time, information obtained may only be applicable to the present situation in Malaysia. Thus, the findings may not be suitable in the future as the data would be outdated. As such, exploring the longitudinal evidences on the behavioural intention to adopt mobile apps is limited.

5.5 Recommendations for Future Research

Based on the limitations that exist in this research, future studies should involve greater respondents in other ethnicities, or conduct a multi-country comparison study to better understand the adoption intention in different cultural contexts. Additionally, future research can build on this study by testing the UTAUT2 in different age groups.

Future studies can extend the model that was applied in this study to predict the intention of continual usage and compare the results with adoption intention. Follow-up studies should also construct a more comprehensive model by incorporating moderating variables to predict adoption intentions. Past studies have proved that age, gender, and experience has an influence on adoption intention.

Lastly, future researchers should use the longitudinal approach to predict adoption intention over time. As such, the model should be validated at different points in time. For example, future studies should study adoption intention in stages, such as pre-adoption and post-adoption of mobile apps.

5.6 Conclusion

The key determinants that influence the behavioural intention to adopt mobile apps has been successfully examined using the UTAUT2 model. Findings revealed that HT has the most significant influence on behavioural intention, followed by HM, PE, and EE, while SI, PV and FC does not influence behavioural intention. Overall, the result of this work is indeed helpful for business practitioners in the mobile apps industry in advancing their corporate and marketing strategies.

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APPENDIX A

Summary of Past Empirical Studies on the Relationship between UTAUT2 Elements and Behavioural Intention

1. PERFORMANCE EXPECTANCY (Independent Variable)

No.	Study	Country	Data	Major Findings
1	Sun, Cao and You, 2010	China	228 online survey questionnaires were collected from mobile services users in China.	Perceived usefulness has a significant effect on behavioral intention to adopt mobile services.
2	Leong, Hew, Tan & Ooi, 2013b	Malaysia	A total of 265 out of 300 questionnaires were collected from randomly selected users in the state of Kampar, Perak.	Perceived usefulness is important and has a stronger effect on intention to use mobile credit card.
3	AbuShanab & Pearson, 2007	Jordan	Questionnaires were collected from 878 cases of Jordanian bank customers that were distributed through 3 banks in Jordan.	PE was proven to be a significant factor on customer intention to adopt internet banking.
4	Im, Hong & Kang, 2011	Korea & U.S.	550 out of 660 questionnaires were collected from Korea (randomly selected college students & office workers) and U.S. (undergraduate and part-time MBA students in a university on the East Coast of the U.S.).	PE has a positive impact on users' intention to adopt technology. However, the impact of PE on behavioral intention was not significantly different between U.S. and Korea. It shows that performance is an important factor that affects technology adoption equally across countries.

2. EFFORT EXPECTANCY (Independent Variable)

No.	Study	Country	Data	Major Findings
5	Teo & Noyes, 2012	Singapore	264 survey questionnaires were completed by the pre-service teachers who registered at the National Institution of Education in Singapore.	EE is a significant determinant of behavioral intention to use technology. Users' intention to use technology is fostered by their perception of how easy it is to use technology.
6	Tan, Sim, Ooi & Phusavat, 2011	Malaysia	402 questionnaires were completed by the university students from the largest private university in the state of Perak.	There is strong consistent relationship between perceived ease of use and m-learning adoption. The findings also indicate that age is significant with perceived ease of use as the young respondents are capable to adopt m-learning easily.
7	Wu, Tao & Yang, 2007	Taiwan	A total of 394 responses were collected via online questionnaire and on-the-spot distribution of telecommunications companies.	EE did not significant influence on the behavioral intention to use 3G mobile communication services. It indicates that only "ease of use" is not enough to attract 3G mobile communication users.
8	Yang, 2010	USA	400 mobile services users were drawn from a purchased consumer panel and participated in an online survey.	EE is not positively related to attitude toward using mobile shopping services. Results show that the ease of using mobile shopping services may not be a significant driver of attitude and consequently behavioral intention to use mobile shopping services. However, EE is a driving factor for utilitarian PE and hedonic PE of m-shopping services.

3. SOCIAL INFLUENCE (Independent Variable)

No.	Study	Country	Data	Major Findings
9	Akour, 2009	United States	A total of 271 freshman students in Oklahoma State University were surveyed through questionnaires and 251 instruments were usable for the research.	There is a strong significant relationship between extrinsic influence and acceptance of m-learning in higher education.
10	Taylor, Voelker & Pentina, 2011	United States	A convenience sample of 180 students from a medium-sized university in the U.S. Midwest was surveyed.	There is a significant relationship between students' social networks and their adoption of mobile apps.
11	Leong, Ooi, Chong & Lin, 2013a	Malaysia	Paper-based questionnaires were distributed face to face to 638 users of mobile devices in the largest private university in Perak state.	SI has a significant influence on BI to use m-entertainment.
12	Yang, 2013	Southeast America	555 out of 600 online survey questionnaires were collected from the young American consumers who aged 18-35 in public university at Southeast America.	There is no significant relationship between subjective norms and intention to use mobile apps.
13	Lu, Yao & Yu, 2005	Texas	357 online survey questionnaires were collected from the MBA students of the regional university in Texas.	Social influences in the form of subjective norm and image have a negative impact on intention to adopt wireless internet services. When usage is not mandatory, subjective norms and sense of image seem to work through perceptions rather than intention.

4. FACILITATING CONDITIONS (Independent Variable)

No.	Study	Country	Data	Major Findings
14	Yeoh & Chan, 2011	Malaysia	A total of 200 respondents selected using convenience sampling answered self-administered questionnaires in Kuala Lumpur.	There is a significant relationship between FC and BI to adopt internet banking.
15	Wu, Tao & Yang, 2007	Taiwan	A total of 394 responses were collected via online questionnaire and on-the-spot distribution of telecommunications companies.	There is a significant relationship between DC and BI for 3G mobile telecommunication services.
16	Teo & Noyes 2012	Singapore	254 pre-service teachers enrolled at the National Institute of Education participate to complete the survey questionnaires.	There is no significant influence of FCs on BI to use technology.
17	Jambulingam, 2013	Malaysia	A total of 351 questionnaires were randomly selected out of the 1100 distributed to undergraduate students in private universities in Selangor and Kuala Lumpur.	FCs are not significant drivers of BI on m-learning adoption.

5. HEDONIC MOTIVATION (Independent Variable)

No.	Study	Country	Data	Major Findings
18	To, Liao & Lin, 2007	Taiwan	206 questionnaires were collected from people in industry (employees or their	HM has direct impact on search intention and indirect impact on purchase intention in the online shopping

			relatives from 20 companies), street distribution (railway stations at Taipei & Chiayi) and convenient sampling (graduate and undergraduate students of EMBA).	environment. HM is important in a physical distribution channel.
19	Magni, Taylor & Venkatesh, 2010	United States	258 full-time MBA students at a large public university in the eastern United states were exposed to a new technology, a personal digital assistant (PDA). Data were collected via questionnaires at two points in time (adoption and post adoption) in this year-long study.	Hedonic and instrumental factors affect users' intentions to explore. However, the effects of these factors vary across stages of technology adoption.
20	Yang, 2010	United States	400 mobile services users were drawn from a purchased consumer panel and participated in an online survey.	The hedonic aspect of mobile shopping services is the most critical determinant of US consumers' intentions to use mobile shopping services. Hedonic performance expectancy increases when consumers participate in mobile community sites or when they use animated or multisensory mobile shopping service features.
21	Lewis, Fretwell, Ryan & Parham, 2013	United States	Data were collected via an online survey from 46 business faculty members at a South eastern University in the U.S.	HM does not positively influence the intention to use classroom technology.

6. PRICE VALUE (Independent Variable)

No.	Study	Country	Data	Major Findings
22	Prata, Moraes & Quaresma, 2012	Brazil	321 responses were collected from online questionnaire about search, purchase and evaluation process about mobile apps store usage.	Users gave up from buying an app. The main reason was the apps price as it was perceived to be expensive. Also, 35.88% of all users felt that it is an impediment to buy an app.
23	Munnukka, 2004	Finland	778 responses out of 3,000 questionnaires were gathered from quantitative postal survey on customers of TeliaSonera's mobile services.	The results of this study show that the price sensitivity and customers' innovativeness were two significant determinants of customers' price perception levels. Furthermore, customers prefer to get mobile services in bundles than to get it separately. There is a positive relationship between customers' bundle preferences and price perceptions.
24	Chong, 2013	China	376 survey questionnaires were collected from m-commerce users in two universities located at Zhejing, Province, China.	There is negative and significant relationship between cost and adoption of m-commerce. Although there are many free applications, consumers are still concerns about the costs such as 3G payments and the cost of mobile devices.
25	Toh, Marthandan, Chong, Ooi & Arumugam , 2009	Malaysia	222 survey questionnaires were collected from the customers of mobile phone service provider's shop located in various shopping malls in Malaysia.	There has negative relationship between perceived cost of using m-commerce and the consumers' intention to use m-commerce. The result indicated that the increasing in cost will result in the decrease of adoption rate of m-commerce.

7. HABIT (Independent Variable)

No.	Study	Country	Data	Major Findings
26	Liao, Palvia & Lin, 2006	Taiwan	862 of mail surveys were sent out and 446 usable questionnaires were collected from targeted undergraduate and graduate students as well as company employees.	Habit has been verified to be a major predictor of behavioral intention to continue using B2C website. Also, habit has a direct linkage with continuance intention, mediated by perceived usefulness and trust.
27	Pahnila, Siponen & Zheng, 2011	Shanghai, China	182 respondents participated and 180 of reliable paper-form questionnaires collected from students of University of Shanghai, China.	Habit has a significant impact on actual use of Tao Bao. Also, habit significantly increases the explanatory value of the UTAUT model.
28	Lewis, Fretwell, Ryan & Parham, 2013	United States	Data were collected via an online survey from 46 business faculty members at a South eastern University in the U.S.	Habit plays an important role in predicting intention to use classroom technology. Also, habit is positively influence the intention to use classroom technology.

APPENDIX B

Variables and Measurements

Independent Variable	Item	Description	Adapted from	Measurement
1. Performance Expectancy	PE1	I find mobile apps useful in my daily life.	Venkatesh et al. (2012)	Interval
	PE2	Using mobile apps increases my chances of achieving things that are important to me.		
	PE3	Using mobile apps helps me accomplish things more quickly.		
	PE4	Using mobile apps increases my productivity.		
	PE5	Overall, I would find mobile apps to be advantageous.	Leong et al. (2013)	
2. Effort Expectancy	EE1	Learning how to use mobile apps is easy for me.	Venkatesh et al. (2012)	Interval
	EE2	My interaction with mobile apps is clear and understandable.		
	EE3	I find mobile apps easy to use.		
	EE4	It is easy for me to become skillful at using mobile internet.		
	EE5	I find it easy to get mobile apps to do what I want it to do.	Venkatesh et al. (2003)	
3. Social Influence	SI1	People who are important to me think that I should use mobile apps.	Venkatesh et al. (2012)	Interval
	SI2	People who influence my behavior think that I should use mobile apps.		
	SI3	People whose opinions that I value prefer that I use mobile apps.		

	SI4	Friend's suggestion and recommendation will affect my decision to use mobile apps.	Leong et al. (2013)	
	SI5	I would use mobile apps because the proportion of my friends uses mobile apps.	Yang (2010)	
4. Facilitating Conditions	FC1	I have the resources necessary to use mobile apps.	Venkatesh et al. (2012)	Interval
	FC2	I have the knowledge necessary to use mobile apps.		
	FC3	Mobile apps are compatible with other technologies I use.		
	FC4	I can get help from others when I have difficulties using mobile apps.		
	FC5	Using mobile apps is entirely within my control.	Venkatesh et al. (2003)	
5. Hedonic Motivation	HM1	Using mobile apps is fun.	Venkatesh et al. (2012)	Interval
	HM2	Using mobile apps is enjoyable.		
	HM3	Using mobile apps is entertaining.		
	HM4	Using mobile apps gives me pleasure.	Yang (2013)	
	HM5	Using mobile apps is exciting.		
	HM6	Using mobile apps is thrilling.	To et al. (2007)	
	HM7	Using mobile apps is delightful.		

6. Price Value	PV1	Mobile apps are reasonably priced.	Venkatesh et al. (2012)	Interval
	PV2	Mobile apps are a good value for money.		
	PV3	At the current price, mobile apps provide good value.		
	PV4	I have never given up purchasing an app.	Prata et al. (2012)	
7. Habit	HT1	The use of mobile apps has become a habit for me.	Venkatesh et al. (2012)	Interval
	HT2	I am addicted to using mobile apps.		
	HT3	I must use mobile apps.		
	HT4	Using mobile apps has become natural to me.		
	HT5	Using mobile apps is something I do without thinking.	Verplanken & Orbell (2003)	

Dependent Variable	**Item**	**Description**	**Adapted from**	**Measurement**
Behavioural Intention	BI1	I intend to continue using mobile apps in the future.	Venkatesh et al. (2012)	Interval
	BI2	I will always try to use mobile apps in my daily life.		
	BI3	I plan to continue to use mobile apps frequently.		
	BI4	I will often use mobile apps in the future.	Davis (1989)	
	BI5	I will recommend others to use mobile apps.	Akour (2010)	

APPENDIX C

UNIVERSITI TUNKU ABDUL RAHMAN
Faculty of Business and Finance

BACHELOR OF COMMERCE (HONS) ACCOUNTING
FINAL YEAR PROJECT

UTAUT2 Influencing the Behavioral Intention to Adopt Mobile Applications

Survey Questionnaire

Dear respondent,

We are final year undergraduate students of Bachelor of Commerce (HONS) Accounting, from Universiti Tunku Abdul Rahman (UTAR). The purpose of this survey is to investigate the factors that influence the behavioral intention to adopt mobile applications. Please answer all questions in **ALL** sections. All responses are completely confidential.

Thank you for your participation.

Instructions:

1) There are THREE (3) sections in this questionnaire. Please answer ALL questions in ALL sections.
2) Completion of this form will take you 5-10 minutes.
3) The contents of this questionnaire will be kept strictly confidential.

Section A: Demographic Profile

In this section, we would like you to fill in some of your personal details. Please tick your answer and your answers will be kept strictly confidential.

QA 1: Gender: □ Female □ Male

QA 2: Age:
- □ 18 years or less
- □ 19 to 22 years
- □ 23 to 26 years
- □ 27 years or more

QA 3: Ethnicity:
- □ Malay
- □ Chinese
- □ Indian
- □ Other

QA 4: Currently pursuing:
- □ Secondary School
- □ Foundation / Matriculation
- □ Diploma
- □ Degree
- □ Others

QA 5: Have you used mobile apps before?
- □ Yes
- □ No

QA 6: Do you have mobile apps on you mobile device?
- □ Yes
- □ No

QA 7: Experience with mobile apps use
- □ Less than 3 years
- □ 3 to 6 years
- □ Over 6 years

QA 8: How often do you use mobile apps?
- □ Never
- □ Seldom
- □ Sometimes
- □ Often
- □ Very often
- □ Always

QA 9: Do you own the following devices:

□ Mobile phone
□ Smartphone
□ Tablet
□ Personal Digital Assistant (PDA)

QA 10: Types of mobile apps you use (can choose more than one):

□ Communication
□ Emergency
□ Entertainment
□ Content Delivery
□ Transaction
□ Location

Section B: UTAUT 2

This section is seeking your opinion regarding the importance of mobile applications (apps). Respondents are asked to indicate the extent to which they agreed or disagreed with each statement using 7 Likert scale [(1) = strongly disagree; (2) = somewhat disagree; (3) = disagree; (4) = neutral (5) = agree; (6) somewhat agree; (7) strongly agree] response framework. Please circle one number per line to indicate the extent to which you agree or disagree with the following statements.

No	Questions	Strongly Disagree	Somewhat Disagree	Disagree	Neutral	Agree	Somewhat Agree	Strongly Agree
PE	**Performance Expectancy**							
PE1	I find mobile apps useful in my daily life.	1	2	3	4	5	6	7
PE2	Using mobile apps increases my chances of achieving things that are important to me.	1	2	3	4	5	6	7
PE3	Using mobile apps helps me accomplish things more quickly.	1	2	3	4	5	6	7
PE4	Using mobile apps increases my productivity.	1	2	3	4	5	6	7
PE5	Overall, I would find mobile apps to be advantageous.	1	2	3	4	5	6	7

No	Questions	Strongly Disagree	Somewhat Disagree	Disagree	Neutral	Agree	Somewhat Agree	Strongly Agree
EE	**Effort Expectancy**							
EE1	Learning how to use mobile apps is easy for me.	1	2	3	4	5	6	7
EE2	My interaction with mobile apps is clear and understandable.	1	2	3	4	5	6	7
EE3	I find mobile apps easy to use.	1	2	3	4	5	6	7
EE4	It is easy for me to become skillful at using mobile apps.	1	2	3	4	5	6	7
EE5	I find it easy to get mobile apps to do what I want it to do.	1	2	3	4	5	6	7

No	Questions	Strongly Disagree	Somewhat Disagree	Disagree	Neutral	Agree	Somewhat Agree	Strongly Agree
SI	**Social Influence**							
SI1	People who are important to me think that I should use mobile apps.	1	2	3	4	5	6	7
SI2	People who influence my behavior think that I should use mobile apps.	1	2	3	4	5	6	7
SI3	People whose opinions that I value prefer that I use mobile apps.	1	2	3	4	5	6	7
SI4	Friend's suggestion and recommendation will affect my decision to use mobile apps.	1	2	3	4	5	6	7
SI5	I would use mobile apps because the proportion of my friends uses mobile apps.	1	2	3	4	5	6	7

No	Questions	Strongly Disagree	Somewhat Disagree	Disagree	Neutral	Agree	Somewhat Agree	Strongly Agree
FC	**Facilitating Conditions**							
FC1	I have the resources necessary to use mobile apps.	1	2	3	4	5	6	7
FC2	I have the knowledge necessary to use mobile apps.	1	2	3	4	5	6	7
FC3	Mobile apps are compatible with other technologies I use.	1	2	3	4	5	6	7
FC4	I can get help from others when I have difficulties using mobile apps.	1	2	3	4	5	6	7
FC5	Using mobile apps is entirely within my control.	1	2	3	4	5	6	7

No	Questions	Strongly Disagree	Somewhat Disagree	Disagree	Neutral	Agree	Somewhat Agree	Strongly Agree
HM	**Hedonic Motivation**							
HM 1	Using mobile apps is fun.	1	2	3	4	5	6	7
HM 2	Using mobile apps is enjoyable.	1	2	3	4	5	6	7
HM 3	Using mobile apps is entertaining.	1	2	3	4	5	6	7
HM 4	Using mobile apps gives me pleasure.	1	2	3	4	5	6	7
HM 5	Using mobile apps is exciting.	1	2	3	4	5	6	7
HM 6	Using mobile apps is thrilling.	1	2	3	4	5	6	7
HM 7	Using mobile apps is delightful.	1	2	3	4	5	6	7

No	Questions	Strongly Disagree	Somewhat Disagree	Disagree	Neutral	Agree	Somewhat Agree	Strongly Agree
PV	**Price Value**							
PV1	Mobile apps are reasonably priced.	1	2	3	4	5	6	7
PV2	Mobile apps are a good value for money.	1	2	3	4	5	6	7
PV3	At the current price, mobile apps provide good value.	1	2	3	4	5	6	7
PV4	I have never given up purchasing an app.	1	2	3	4	5	6	7

No	Questions	Strongly Disagree	Somewhat Disagree	Disagree	Neutral	Agree	Somewhat Agree	Strongly Agree
HT	**Habit**							
HT1	The use of mobile apps has become a habit for me.	1	2	3	4	5	6	7
HT2	I am addicted to using mobile apps.	1	2	3	4	5	6	7
HT3	I must use mobile apps.	1	2	3	4	5	6	7
HT4	Using mobile apps has become natural to me.	1	2	3	4	5	6	7
HT5	Using mobile apps is something I do without thinking.	1	2	3	4	5	6	7

Section C: Behavioral Intention

This section is seeking your opinion regarding the importance of mobile applications (apps). Respondents are asked to indicate the extent to which they agreed or disagreed with each statement using 7 Likert scale [(1) = strongly disagree; (2) = somewhat disagree; (3) = disagree; (4) = neutral (5) = agree; (6) somewhat agree; (7) strongly agree] response framework. Please circle one number per line to indicate the extent to which you agree or disagree with the following statements.

No	Questions	Strongly Disagree	Somewhat Disagree	Disagree	Neutral	Agree	Somewhat Agree	Strongly Agree
BI	**Behavioral Intention**							
BI1	I intend to continue using mobile apps in the future.	1	2	3	4	5	6	7
BI2	I will always try to use mobile apps in my daily life.	1	2	3	4	5	6	7
BI3	I plan to continue to use mobile apps frequently.	1	2	3	4	5	6	7
BI4	I will often use mobile apps in the future.	1	2	3	4	5	6	7
BI5	I will recommend others to use mobile apps.	1	2	3	4	5	6	7