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FACTORS AFFECTING THE ADOPTION OF TOUCHSCREEN MOBILE PHONES: AN EMPIRICAL STUDY AMONG GENERATION Y

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This research intends to examine empirically the factors that affect the BI (Behaviour Intention) of GY (Generation Y) to adopt TPs (Touchscreen Mobile Phone) in Malaysia. The five factors examined are PU (Perceived Usefulness), PEOU (Perceived Ease of Use), IM (Image), SI (Social Influence), and PE (Perceived Enjoyment). The sample consists of 230 respondents with a response rate of 77.97 per cent. Pearson Correlation Analysis and Multiple Regression Analysis Data were employed to analyse the data collected.

The findings of this research suggested that PU, IM, SI, and PE are all positively and significantly related with the BI of GY to adopt TPs in Malaysia. However, even though PEOU was found to have positive correlation with the BI, this factor is not significant in explaining the BI of GY to adopt TPs in Malaysia.

Nevertheless, the generalizability of the findings is limited as this research is only focused in Malaysia. Based on the findings, touchscreen phone manufacturers should invent more useful features and blend them with the touchscreen technology, create a noble brand image, build customer loyalty, and invent some features that could bring enjoyment to improve the adoption of touchscreen phones.

The findings also ascertained the factors that affect the adoption of TPs by GY in Malaysia. This research also successfully extended the TAM in the context of Malaysia and touchscreen phones by incorporating IM, SI, and PE into it. As the model employed had been proven as fit in this research, therefore the findings also concluded that TAM could be adopted in technology adoption study.

Keywords: Touchscreen Mobile Phone, Generation Y, Technology Acceptance Model.

1. INTRODUCTION

1.1. Research Background

Mobile phone acts as a means of distant communication tool that provides a platform to support distant collaborative work (Hakkila & Mantyjarvi, 2005). As of second quarter of 2009, the penetration rate has reached 100.8 per cent In Malaysia. The over 100 per cent penetration rate is due to multiple subscriptions by one user (Karim, Alias, Mokhtar & Rahim, 2009).

Few years ago, TPs had been introduced into the mobile market. It is a mobile phone that replaces traditional keypads with a touchscreen, such as Apple iPhone (Park & Han, 2010). According to Lipsman (2009), the TP users in U.S. had grown at a rate of 159 percent in August 2009 compared to past year with 23.8 million users.

Besides, Pettey and Tudor (2010) also reported that 58 per cent of touchscreen mobile devices are expected to contribute to the worldwide mobile devices sales by 2013 and touchscreen technologies are now being integrated into many midrange phones.

GY refers to those who were born between 1977 and 1994 (Broadbridgea, Maxwellb & Ogden, 2009; Noble, Haytko & Phillips, 2009), therefore, GY is now in the age group of 17 to 34 years old in 2011. Other than having mobile phones throughout their lives, people from this generation are also grown up with technology and hence they are somehow technologically savvy (Schlitzkus, Schenarts & Schenarts, 2010; Djamasbia, Siegelb & Tullis, 2010; Nusair, Parsa & Cobanoglu, 2011).

1.2. Problem Statement

Certain researchers claimed that TAM is not a good model for technology adoption study. For instant, Sun and Zhang (2006) criticised that TAM's explanatory power is limited. Nevertheless, there are some researchers who found that TAM is good in technology adoption study. For example, past studies concentrating on ordinary mobile phones with keypad (Lu & Zhang, 2008; Karim *et al.*, 2009; Biljon & Kotze, 2007), mobile internet (Shin, 2007), mobile marketing (Bauer, Barnes, Reichardt & Neumann, 2005), m-commerce (Yang, 2005), and so forth. These studies are similar to users' adoption and acceptance of mobile phones and mobile related services; study on TPs, however, is very limited and considerably less pronounced.

Yusoff, Ramayah, and Ibrahim (2010) stated that although there were many researches on TAM in Malaysia, those researches mainly concentrated on the area of banking, manufacturing, education, and government sectors. Furthermore, even though there are past technology adoption studies that mainly focused on GY, for example, GY adoption of instant messaging (Anandarajan, Zaman, Dai & Arinze, 2010), TP adoption study that mainly focus on GY is still lacking.

Due to the lacking of past study on users' adoption and acceptance of TPs that focus on GY, either in Malaysia or other countries' context, the factors affecting the BI to adopt TPs are somehow uncertain currently.

1.3. Research Questions and Objectives

Table 1 shows the general research question and general research objective; and Table 2 displays the specific research questions and specific research objectives.

1.4. Significance of the Study

Since the past technology adoption studies that focused on both TP and GY are deficient, thus this study allows mobile phone manufacturers to understand the factors that influence the BI of GY to adopt TPs in Malaysia. Other phone manufacturers who plan to introduce their TPs in Malaysia can also refer to this study in order for them to get a clearer picture to develop their business plan. TAM has been a broadly cited model in explaining user behaviour and IT usage (Yu, Ha, Choi & Rho, 2005). However, the traditional variables in TAM (PU and PEOU) are still insufficient to provide an in-depth understanding of the factors affecting the BI to adopt TPs in Malaysia's context. Thus, this study is extending the model by adding in three more variables namely IM, SI, and PE into the model to suit Malaysia's context. Therefore, this research study is also aimed to contribute to scholars, through the newly extended TAM model. Furthermore, this study also intends to address the gap in existing literatures, by providing the ascertained factors that affect the BI to adopt TPs, through the extended TAM.

Table 1: General Research Question and General Research Objective

General Research Question	**General Research Objectives**
Is TAM sufficient in explaining the BI of GY to adopt TPs?	To prove that the TAM is able to predict the BI of GY to adopt TPs in Malaysia.

Table 2: Specific Research Questions and Specific Research Objectives

Specific Research Questions	**Specific Research Objectives**
Does PU relate with the BI of GY to adopt TPs?	To establish the relationship between PU with the BI of GY to adopt TPs.
Does PEOU relate with the BI of GY to adopt TPs?	To establish the relationship between PEOU with the BI of GY to adopt TPs.
Does IM relate with the BI of GY to adopt TPs?	To establish the relationship between IM with the BI of GY to adopt TPs.

Does SI relate with the BI of GY to adopt TPs?	To establish the relationship between SI with the BI of GY to adopt TPs.
Does PE relate with the BI of GY to adopt TPs?	To establish the relationship between PE with the BI of GY to adopt TPs.
Which is the strongest determinant of BI of GY to adopt TPs among the 5 IVs (PU, PEOU, IM, SI, PE)?	To determine the strongest determinant of BI of GY to adopt TPs among the 5 IVs (PU, PEOU, IM, SI, PE).

2. LITERATURE REVIEW

2.1. TAM

The TAM proposed by Davis (1989) suggested that usage of an information system depends on a user's intention to use the system, which in turn is determined by the user's belief about the system. The two determinants or factors of salient belief are PU and PEOU (Kwon, Choi & Kim, 2007). In other words, PU and PEOU are the most important factors in explaining user's adoption intention of a technology.

TAM has been widely used in researches about various information services, technology products and other innovations. For instance, Benamati and Rajkumar (2002) applied the TAM to explain outsourcing decision of information system. Pavlou (2003) used the TAM to evaluate users' acceptance of e-commerce.

With the continuous development and advancement of technology, many researchers have modified the TAM by adding in other relevant variables. Kwon et al. (2007), for example, added self-efficacy and user innovativeness to their study on users' acceptance of context-aware services. Perceived technology compatibility and perceived playfulness were added to the study of Tan and Chou (2008) regarding mobile information and entertainment services. On the other hand, Shin (2009) included perceive quality and perceived availability in his research on IPTV. As for this study on TP which is conducted in Malaysia, the TAM has been extended by combining PU and PEOU with several other variables to make it suits the Malaysia's context. The additional variables are PE, IM and SI.

Other than adding in variables, there are two extra main differences between the original TAM (Figure 1) and the research model employed in this study (Figure 2). Firstly, in order to maintain the conciseness of the research model, BI is adopted as an individual's intention to adopt TPs (Suki, 2011). According to Suki (2011), there is a strong connection between intention to engage in a behaviour and actual behaviour, therefore BI to adopt TPs is selected to inspect the adoption of TPs instead of "Actual Use" in the context of this study (Suki, 2011; Wei, Marthandan, Chong, Ooi & Arumugam, 2009; Carter & Belanger, 2004). Secondly, the "Attitude" constructed in the original TAM has been dropped out from the model employed in this study for the purpose of simplicity (Luarn and Lin, 2005).

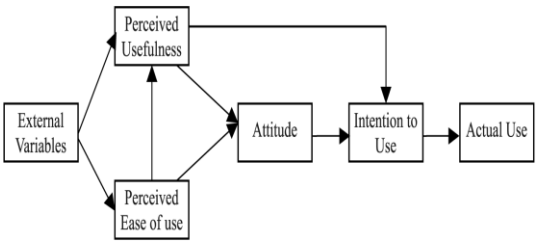

Figure 1: Original TAM

Source: Davis (1989).

Davis (1989) defined PU as "a person believes that using the given technology will enhance his job performance and effectiveness" and PEOU as "the degree to which an individual believes that using a particular system would be free of physical and mental effort". In the context of this study, PU means that the more useful a TP is in one's belief, the higher the possibility of adoption. As for PEOU, if an individual perceives that TP's usage is simple or free of effort, then the probability of adoption would increase.

2.2. Review of the Prior Empirical Studies

2.2.1. Perceived usefulness

On the other hand, PU means the prospective user's subjective probability that using a specific application system or new technology will enhance his job expression within an organizational context (Suki, 2011).

In the study of the intention to use world-wide-web (Moon & Kim, 2001), it has been proven that PU has a positive relationship with BI. The

population consisted of individual who had used WWW in their tasks and the sample included graduate students who were majoring in School of Management.

According to Li, Chau, and Lou (2005), who did a study on the adoption of instant messaging, PU is positively associated with BI. The population was made up of undergraduate students taking business courses in the universities and the sample consisted of students from two mid-western public universities.

As Conci, Pianesi, and Zancanaro (2009) concluded in their journal of mobile phone adoption by older people, PU has a positive relationship with BI to use. Elders were the population in this journal and the elders who joined the activities of Third Age University of Trento were the sample.

2.2.2. Perceived ease of use

PEOU has also been defined as "an individual believes that the degree of effort needed to use a particular new technology or system will be easy or effortless" (Rouibah & Abbas, 2006).

Ramayah and Ignatius (2005) carried out a research pertaining to the intention to shop online. The population of this research was those who have been exposed to the concept of internet shopping; whereas the sample included staff of public institution of higher learning. As a result, they had concluded that PEOU of the technology is positively related with the e-shopper's BI.

In addition, Sung and Yun (2010) conducted a research about adoption of mobile multimedia service. Population in this research comprised college students and the sample size consisted of undergraduate students in a large mid-western university. This research concluded that there is a positive relationship between PEOU and BI.

Other than that, Suki (2011) proved that there is a positive relationship between PEOU and BI in the research of 3G mobile services adoption factors. Subscribers of 3G mobile services made up the population and data was collected from subscribers of 3G mobile services.

2.2.3. Image

IM refers to the degree to which the use of an innovation is perceived to enhance a person's image or status in the person's social system (Li, 2010). For some innovations, image is the desire to gain social status (Rao & Troshani, 2007).

In the study of the adoption of MMS, the result showed that IM is positively associated with BI to adopt MMS positively. The population of the study consisted of all MMS enabled mobile phone users in Taiwan, and the sample included both potential users and experienced users of MMS in Taiwan (Hsu, Lu & Hsu 2007).

The finding is consistent with previous study which had concluded that higher level of IM will increase citizens' BI to use state government service online. This research was based on USA citizens but only college students who had used the web to complete government transaction were chosen as sample (Carter *et al*., 2004).

According to Hussein, Mohamed, Ahlan, Mahmud and Aditiawarman (2010), IM has a positive relationship with BI to adopt online tax. The population was those who have experienced in using the e-Filing system. The sample consisted of lecturers and administrative staffs from five different public universities.

According to Lee (2007), the stereotyping of Chinese Malaysians are selfish is still widespread; and due to the selfish mentality and behaviours, Chinese Malaysians are somehow *kiasu*. Joseph (2006) also pointed out that Chinese Malaysians are more *kiasu* compared to non-Chinese in Malaysia, which also indicates that non-Chinese Malaysians are also *kiasu*.

Lee (2007) further provided that *kiasu* literary refers to the attitude of being afraid to lose; and to a certain extent *kiasuism* is about comparing oneself to others with the purpose of showing off one's superior status and demonstrate that one is better than others. Therefore in Malaysia, IM would be an important factor in affecting the BI of GY to adopt TPs. If one believes that adopting a TP would increase his or her social status, then due to *kiasuism*, he or she will most probably adopt it.

2.2.4. Social influence

SI acts as a determinant that influences one's behaviours (Shin, 2007). It is defined as a kind of belief, which is significant enough to influence a person to participate in an activity (Chong, Darmawan, Ooi & Lee, 2010). They further stated that SI is distinguished into mass media and interpersonal influence. Wei et al. (2009) claimed

that mass media comprises of newspapers, magazines, radio, television, internet, and so forth; whereas interpersonal influence is derived from social network such as friends and peers.

According to innovation diffusion research, a user's adoption decisions are highly influenced by a social network compared to one's decision style and characteristics of IT (Hsu & Lu, 2004; Kim, Kim & Eun, 2009).

Additionally, Hsu et al. (2004) found that users' BI to play an online game is positively affected by SI. The population of the research consisted of online game users in Taiwan and the sample was self-selected online game users who saw the messages placed on over 50 heavily trafficked online message boards on popular game related web sites.

Kim et al. (2009) conducted a research on the adoption factors of mobile entertainment service and they had found out that SI has a positive relationship with the BI to adopt mobile entertainment service. The population of the study consisted of college students and working adults in the South Korea and the sampling technique used was convenience sampling.

Kulviwat, Bruner II and Al-Shuridah (2009) also researched on the role of SI in the adoption of high tech innovations. Students in Midwestern U.S. University made up the population of this study. The sample was drawn from students enrolled in a large class with a wide variety of majors. A positive relationship between SI and the BI to adopt an innovation was concluded in this study.

Sani, Yusof, Kasim and Omar (2009) stated that Malaysia is a strong family based society and community cohesiveness has been powerfully prioritised over the individual rights in Malaysia. Jung and Kau (2004) found that family decision does play an important role in influencing consumers purchasing behaviour.

Thus, in Malaysia, SI would be a crucial factor in affecting the BI to adopt TPs. If one's friends, family and community have already adopted TPs and they think that he should adopt one, this would definitely influence his BI to adopt TPs.

2.2.5. Perceived enjoyment

PE is the perception of enjoyment, fun and pleasure inherent in using communication technology (Li *et al*., 2005). Venkatesh (2000) conceptualised enjoyment as an antecedent of ease of use, whose effect increases over time as users gain more experience with the system.

In their study pertaining SMS adoption, Lu, Deng and Wang (2010) proved that PE has a positive effect on SMS adoption among China users. The target population was made up of the mobile phone users in China. Respondents were sampled through the clients of the two largest mobile network operators; and two MBA classes in Wuhan and Zhengzhou.

Heijden (2004) conducted a study on users' acceptance of hedonic information system and in the study it had been concluded that PE is a stronger determinant of BI to use a hedonic information system compared to PU. The population for this study was all the registered users of a movie website. Sample was randomly selected from this population.

According to Li et al. (2005) who studied about individual adoption of instant messaging, PE is positively associated with BI to use instant messaging. The population for their cross-cultural study was made up of US and China internet users. Undergraduates from two US Midwestern universities and graduates from one large China University were the sample selected.

The influence of PE over BI has been proven in some past technology acceptance researches that focused in Asia only, for example in Taiwan (Wang, Chou & Chang, 2010; Chang & Chin, 2011), Singapore (Teo & Noyes, 2011), and Malaysia (Selamat, Jaffar & Boon, 2009). Moreover, Knox and Schacht (2009) found out that GY focuses on fun, entertainment, and flexibility. Thus, PE is believed to be a significant factor in determining the BI of GY in Malaysia's context. If one believes that using a TP provides enjoyment, then he or she will most probably adopt it.

2.3. Factors Affecting the Adoption of Touchscreen Phones

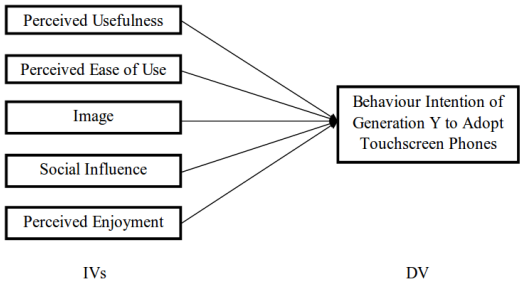

Figure 2: Research Model

Adapted from: Suki (2011); Wei et al. (2009); Carter et al. (2004).

2.4. Hypotheses Development

H1: PU has a positive influence on the BI of GY to adopt TPs.

H2: PEOU has a positive influence on the BI of GY to adopt TPs.

H3: IM has a positive influence on the BI of GY to adopt TPs.

H4: SI has a positive influence on the BI of GY to adopt TPs.

H5: PE has a positive influence on the BI of GY to adopt TPs.

3. RESEARCH METHODOLOGY

3.1. Research Design

This research is a quantitative research, since this research is based on the measurement and quantification of data and different measurement scales are used in this research (Houser, 1998). The relationships between IVs (PU, PEOU, IM, SI and PE) and DV (BI) are established in this study. Thus, the purpose of this study can be classified as an explanatory study. Saunders, Lewis, and Thornhill (2009, p.140) defined explanatory study as a study that "establish causal relationships between variables".

According to Saunders et al. (2009, p.144), survey is a preferred type of data collection procedure, because of its ability to collect large amount of data from a population and it is economical to perform. Furthermore, quantitative data could be collected through a survey, and the data collected can be further analysed analytically using descriptive and inferential statistics. Besides, findings that generalise the whole population could be generated through sampling.

This study is categorised under the cross-sectional study, as there is only one phenomenon at a single point of time to be studied. Trochim (2006) stated that a cross-sectional study takes place at a single point in time. Saunders et al. (2009) further provided that cross-sectional study is looking at a particular phenomenon at a specific time.

3.2. Sampling Design

The population for this research study is GY in Malaysia, particularly those who have experience in using TPs and the sampling location is over the internet, as internet mediated questionnaire was utilised to collect the primary data.

GY who has experience in using TPs would be the target respondent in this study. GY has larger readiness to spend on new technologies (PricewaterhouseCoopers, 2010). Thus, GY is more likely to try out new technology products and adopt TPs than other generations such as Generation X, and this is the reason why GY is selected as the subject in this study, instead of other generations. The unit of analysis for this research is individual, particularly Malaysia's GY who has experience in using TPs.

Due to the fact that the population is huge and it is impossible and impractical to reach every single respondent in the population, sampling technique would be needed. Sampling is essential in the situations where it is impracticable to reach and survey on the whole population; and when there is a limited budget and time for completing the research (Saunders *et al*., 2009, p. 212).

Self-selection sampling technique was used in this study and it is a type of non-probability sampling technique. As the sampling frame is unavailable, therefore none of the probability sampling techniques could be utilised. Self-selection sampling is helpful when researchers want to allow target respondents, to decide on their own will, whether or not to take part in answering the survey. The major advantages of self-selection sampling are that wide diversity of participants can be reached and the target respondents are more

committed in responding to the survey (Holah, 2009).

The rationale of selecting a self-selection sampling is because this technique saves time and cost, and it also helps to reach a larger group of target respondent. Regardless of the location of target respondent, as long as there is an internet access, every target respondent can participate in the survey.

In order to operate multiple regression analysis in this study, the cases to IVs ratio should be fulfilled. According to Grady et al. (2007), 16:1 is generally accepted for multiple regression analyses. There are 5 IVs in this study, therefore a minimum number of 80 cases would be required, and any number of cases exceeds this threshold would be considered satisfactory for multiple regression analysis to be carried out in this study.

In order for each set of scales to be factor analysed, the ideal sample size should have an item-to-response ratios ranging from 1:4 to 1:10 (Wei *et al.,* 2009). There are 24 items to be measured in our research; therefore sample size from 96 to 240 respondents would be enough for the purpose of factor analysis.

In view of the case requirement of both analyses, case number range from 80 to 240 would be deemed as satisfactory. Therefore, the sample size of this study (226 cases) could be considered as satisfactory size.

3.3. Research Instrument

Self-administered questionnaire was used as the method of collecting data. The questionnaire was hosted on http://www.kwiksurveys.com and spread through the internet, which means internet-mediated questionnaire is utilised in this study. Target respondent who is interested to complete the survey would access to the questionnaire through the internet. What has to be done is to spread out the hyperlink of the questionnaire through some famous social networking sites such as Facebook and mobile phone forums in Malaysia.

An event was created on Facebook to invite Facebook users to participate in the survey and the questionnaire's hyperlink was also posted on Mobile88 Forum, lowyat mobile phone forum, and so forth. Moreover, the hyperlink would be further shared by those Facebook users on their own Facebook wall if they wanted to do so. As a result, more and more people can get to know the existence of questionnaire, and they can offer themselves to fill up the questionnaire.

A pilot test is needed to establish the reliability of the model, as well as to remove duplicate items, check for the clarity of the questions and instruction (Molla & Licker, 2005). Thus, a pilot test was done prior to the actual data collection. 30 respondents were included in the pilot test, all of them were GY. Table 3 illustrates the reliability test result of the pilot testing. Overall, the reliability coefficients of all IVs and DV are strong and above the generally accepted criteria of 0.70 (Lai & Chen, 2011; Karim & Noor, 2006), except for PEOU. Therefore, the questionnaire items for PEOU were changed prior to the actual data collection.

3.4. Variables and Measurement

Refer to Table 4 for the definitions of each variable; Table 5 for the sources of variables. Table 6 displays the measurement used for each variable.

The Likert scale ranged from "Strongly Disagree" (1) to "Strongly Agree" (5). Likert scale has been generally employed in questionnaire and it is the most broadly used scale in survey research. Respondents can state their level of agreement, mainly on a five-point scale, to a statement when answering to a Likert questionnaire item (Evens, Schuurman, Marez & Verleye, 2010).

3.5. Data Processing

A total of 295 respondents answered the survey questionnaire. However, 39 of the responses would have to be taken out due to the incompleteness of these cases. 256 cases were remained after the clearance of incomplete cases. Nevertheless, out of the 256 cases, the respondents of 3 cases were not GY, and 23 respondents do not have any experience in using TPs. Again these 26 cases have to be cleared as they are not the target respondent in this study. After the removal of 65 unqualified cases, there were 230 useful cases in the end, thus giving the total respond rate of 77.97 per cent.

In order to achieve the normality assumption, 4 more cases were removed from the 230 cases, and this would be further elaborated in section 4.3.1. In the end, there are only 226 cases left.

3.6. Data Analysis Techniques

3.6.1. Reliability test

The construct would also be assessed for reliability by using Cronbach's alpha. Reliability test is used to determine the stability and consistency of measuring instrument (Choy, Ng & Ch'ng, 2011). According to Lai et al. (2011) in their research of school teachers' adoption of teaching blogs, the commonly accepted level of Cronbach's alpha is 0.70, any value higher than 0.70 would deem to have high reliability. Karim et al. (2006) also agreed that 0.7 would be the commonly accepted level.

Table 3: Reliability Statistics (Pilot Test)

Variables	Cronbach's Alpha	N of Items
PU	0.867	4
PEOU	0.268	5
IM	0.883	5
SI	0.855	5
PE	0.872	4
BI	0.760	3

Table 4: Definitions of variables

Constructs	Definition	Sources
Perceived Usefulness	The degree of which a person believes that using a TP would enhance his or her job performance.	(Sung *et al.*, 2010)
Perceived Ease of Use	The degree to which an individual believes that using TP would be free of physical and mental effort.	(Wei *et al.*, 2009)
Image	The degree to which the use of a TP is perceived to enhance one's image or status in one's social system.	(Teo & Pok, 2003; Carter *et al.*, 2004)
Social Influence	An individual's belief about whether significant others think that one should use TP.	(Wei *et al.*, 2009)
Perceived Enjoyment	The extent to which the activity of using TP is perceived to be enjoyable in its own right, apart from any performance consequences that may be anticipated.	(Sung *et al.*, 2010)
Behaviour Intention	The strength of one's willingness to use a TP.	(Moon *et al.*, 2001)

Table 5: Sources of Variables

Items	Description	Sources
PU1	Using touchscreen mobile phone brings me many benefits.	(Meng *et al.*, 2010)
PU2	Using touchscreen mobile phone improves the performance of my tasks.	(Sung *et al.*, 2010)
PU3	Using touchscreen mobile phone enables me to accomplish tasks more quickly.	
PU4	Using touchscreen mobile phone increases my task productivity.	
PEOU1	It is easy to learn how to use touchscreen phone.	(Wei *et al.*, 2009)
PEOU2	Touchscreen phone is understandable and clear.	
PEOU3	Touchscreen phone is easy-to-use.	
IM1	People who use a touchscreen phone have more prestige than those who do not.	(Carter *et al.*, 2004)
IM2	People who use a touchscreen phone have a high profile.	
IM3	Having a touchscreen phone enhance a person's social status.	
IM4	People who use touchscreen mobile phone are trendy.	(Teo *et al.*, 2003)
IM5	Using touchscreen mobile phone improves my image.	
SI1	Friend's suggestion and recommendation will affect my decision to use touchscreen mobile phone.	(Wei *et al.*, 2009)
SI2	Family members/relatives have influence on my decision to use touchscreen mobile phone.	
SI3	I will use touchscreen mobile phone if my colleagues/friends/relatives use it.	
SI4	Mass media (e.g. TV, newspaper, articles, radio) will influence me to use	

	touchscreen mobile phone.	
SI5	I will use touchscreen mobile phone if it is widely used by people in my community.	
PE1	Using touchscreen mobile phone is entertaining.	(Sung *et al.*, 2010)
PE2	Using touchscreen mobile phone is exciting.	
PE3	Using touchscreen mobile phone provides me with a lot of enjoyment.	(Li *et al.*, 2005)
PE4	I have fun in using touchscreen mobile phone.	
BI1	I believe my interest towards touchscreen mobile phone will increase in the future.	(Wei *et al.*, 2009)
BI2	I believe I will use touchscreen mobile phone in the future.	
BI3	I will strongly recommend others to use touchscreen mobile phone.	(Moon *et al.*, 2001)

Table 6: Measurement of Each Variable

Variables		Measurement	Scale of Measurement
Demographic Profile	Gender	Nominal	
	Age	Ordinal	
	Highest education completed	Ordinal	
	Occupation	Nominal	
	Marital Status	Nominal	
IV	Perceived Usefulness	Interval	5-point Likert scale
	Perceived Ease of Use	Interval	5-point Likert scale
	Image	Interval	5-point Likert scale
	Social Influence	Interval	5-point Likert scale
	Perceived Enjoyment	Interval	5-point Likert scale
DV	Behaviour Intentions	Interval	5-point Likert scale

3.6.2. EFA

Greene and Brown (2009) defined construct validity as "the degree to which the items posited to measure the construct sufficiently capture that construct while not being influenced by any irrelevant sources of variance". Furthermore, Baykal and Circi (2010) provided that construct validity is "the degree to which the response is in accordance with the construct intended to be measured". Einarsdóttir and Rounds (2009) stated that if a test contains some items that seize traits or dimensions, which the test developer does not intend to measure by the test, then the construct validity of the test is endangered.

In this study, EFA with PCA and Varimax rotation is used to appraise the construct validity. 24 items from 5 IVs and 1 DV are examined by principal components extraction with Varimax rotation.

The KMO measure of sampling adequacy was also assessed in this study. Leung, Wong, Ko, Lam and Fok (2005) provided that the minimum acceptable measure of KMO is 0.5. In addition, Pai and Huang (2011) claimed that the higher the KMO measure is, the more appropriate it can be used for factor analysis.

Other than KMO, Bartlett's test of sphericity was also used to test for the possibility to perform factor analysis. Heijden and Verhagen (2004) provided that Bartlett's test of sphericity is significant when $p<0.001$. Chen, Chen and Yen (2011) asserted that if the test is significant, then this would allow the conduction of further factor analysis.

3.6.3. Multicollinearity analysis

As noted by Wei et al. (2009), to avoid multicollinearity problem between IVs, correlation coefficient value should not go further than 0.8. Moreover, VIF and tolerance are also applied to test for multicollinearity among the IVs. Threat of multicollinearity arises when the VIF value of an IV is greater than 10 or its tolerance value is less than 0.10 (Ott & Longnecker, 2011).

3.6.4. Pearson correlation analysis

As proposed by Wei et al. (2009), as well as supported by Wong and Hiew (2005), in order to

examine the association between the variables, Pearson correlation analysis is needed to be carried out. Correlation coefficient value range from 0.10 to 0.29 is deemed to be weak, from 0.30 to 0.49 is regarded as medium and from 0.50 to 1.0 is believed to be strong (Wei *et al.*, 2009; Wong *et al.*, 2005).

3.6.5. Multiple regression analysis

Moreover, in order to investigate the relationship between a single DV and few IVs, multiple regression analysis has to be used (Wei *et al.*, 2009; Leung, Erich & Kanenberg, 2004). Thus, this is suitable in this research as there are 5 IVs and 1 DV in the research model.

Sapp (2006) concludes that multiple regression has 4 assumptions, namely linearity; homoscedasticity of variance (a.k.a. homoscedasticity or homogeneity of variance); normality; and independence of error terms. Hence, these assumptions of multiple regression analysis would also be tested.

As suggested by Sapp (2006), linearity is "the linear relationship between predictors and the DV". For the testing of linearity assumption, Tarling (2008) mentioned that the useful tool to test this assumption would be plotting the standardised residuals against the standardised predicted values. Cramer (1998) provided that the linearity assumption is held "if the overall shape of the distribution of points is rectangular". Cramer (1998) further added on that the relationship is not linear when there is a curved shape. Field (2000) also provided that the assumption of linearity would be met "the points are randomly and evenly dispersed throughout the plot".

Normality of the residual distribution would be tested using Kolmogorov-Smirnov's test. In the e-Collaboration tools adoption research, Chong, Ooi, and Sohal (2009) suggested that Kolmogorov-Smirnov's test can be used for testing normality and the normality is achieved when the test shows a p value greater than 0.05. This statement is backed by Fatoki and Odeyemi (2010). According to Fatoki et al. (2010), if the significance of the Kolmogorov-Smirnov's test is greater than 0.05, then this implies that the normality of the data can be assumed. Moreover, Jaramillo, Vasquez, Gallo, Duque and Bell (2010) mentioned that Kolmogorov-Smirnov's test is used to test the normality for sample size of more than 50 (n>50).

Salkind (2010) defined homoscedasticity as a condition, in which "for all given X values, the amount of variation in Y values remains relatively constant". According to Field (2000), the plot of the standardised residuals against the standardised predicted values could be used to determine whether the assumption of homoscedasticity is violated. The preceding statement is backed by Newton and Rudestam (1999). Field (2000) suggested that the assumption of homoscedasticity would be met if "the points are randomly and evenly dispersed throughout the plot". Nevertheless, homoscedasticity would be violated if at the left side of the X scale, there is only some variation in Y scores; while at the right side of the X scale, there is a huge quantity of variation in the Y scores (Salkind, 2010).

Figure 3 clearly shows approximately how the plot would look like if the assumptions of linearity and homoscedasticity have been met. Plot (a) represents the situation where linearity and homoscedasticity have been met; whereas the other 3 plots (b), (c), and (d) indicate the situation where linearity and homoscedasticity have not been met. Furthermore, Figure 4 symbolizes the situation where homoscedasticity has not been met.

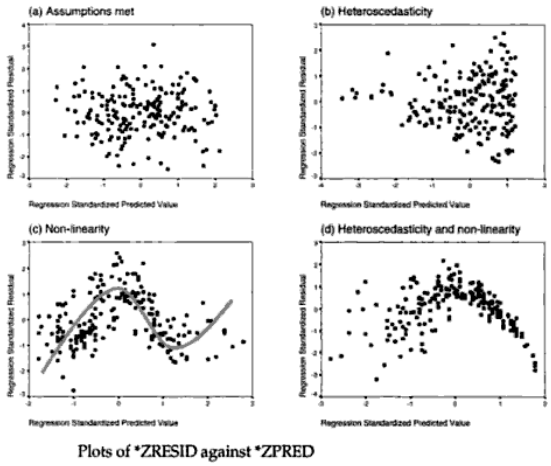

Figure 3: Linearity and Homoscedasticity

Source: Field, A. (2000). *Discovering statistics using SPSS for Windows: Advanced techniques for the beginner*. London: SAGE Publications ltd.

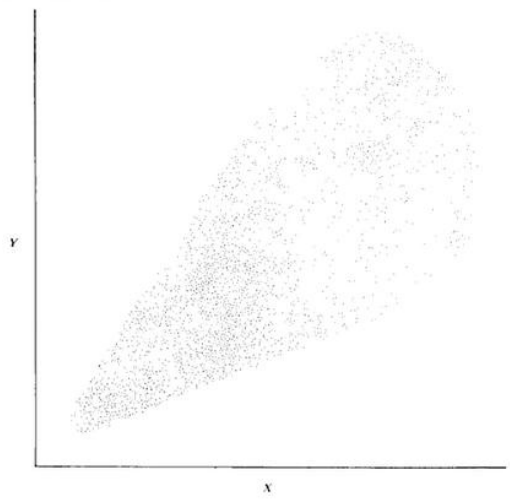

Figure 4: Lacking of Homoscedasticity

Source: Klugh, H. E. (1986). *Statistics: the essentials for research.* New Jersey London: Routledge.

Lighter (2011) recognized error terms in the regression equation as the residuals, which denotes "the difference between the actual value of the DV and the value of the DV that is estimated from the line of best fit." Independence of error terms means that error term (or residuals) are independent and are normally distributed (Hirsch, 2000). Lighter (2011) said that autocorrelation represents lack of independence of error terms.

In other words, lack of autocorrelation implies the independence assumption has been met (Miles & Shevlin, 2001). Durbin-Watson statistic can be utilised to identify the level of autocorrelation (Lighter, 2011). The Durbin-Watson statistic ranges from 0-4. The error terms are positively correlated if the statistic is between 0 and 2; while the error terms are negatively correlated if the statistic is between 2 to 4. Error terms have no autocorrelation when the statistic is close to 2 (Matignon, 2005).

4. DATA ANALYSIS

4.1. Central Tendencies Measurement of Constructs

Mean and standard deviation of the variables were computed in Table 7. The mean values of all the variables range from 3.000 to 3.999. This can be concluded that the variables are more towards neutral and agreed. The standard deviations for all of the variables were less than 1.

Mean and standard deviation of all the questionnaire items were also computed in Table 7. The mean values of the items mostly range from 3.5000 to 3.9999. This can be concluded that these items are more to agree and strongly agree. However there are also mean values that fall in the range between 2.8000 and 2.9999. This means that these items are more to disagree. Mean values which range from 3.0000 to 3.3999 as shown in the result of this study means that these items are more to neutral. For standard deviation, most items have standard deviation of less than 1. Only items under the IM and SI variables have standard deviations which are greater than or near to 1.

4.2. Demographic Profile of the Respondents

The demographic profile of the surveyed respondents is presented in Table 8. It includes gender, age group, highest education achieved, occupation and marital status. The total sample is made up of 226 respondents. The results of the survey revealed that the samples have age predominantly between 17 and 22 years old, which is 71.7%. Meanwhile, only 23% of the respondents are between the age of 23 and 28, followed by 5.3% which are between the age of 29 and 34.

The age group, as well as education level predominance correspond well to the fact that 75.7% of the respondents are students. On the other hand, 19.5% and 3.1% of the respondents are employed and self-employed respectively. Only 1.3% of the respondents are unemployed. There is only 1 respondent (0.4%) who is housewife. The results also indicated that 95.1% of the respondents are single and the remaining 4.9% are married.

4.3. Scale Measurement

4.3.1. Normality assumption

Casewise diagnostics was conducted on the 230 cases. If the DV of a case has a standard residual outside +3 and -3, then it would be identified as outliers and these outliers are needed to be removed. From the result (Table 9), case 64 and 129 are outliers, as their standard residual of their DV are outside -3. Therefore these 2 cases are necessary to be dropped.

After dropping off outliers, the normality test of the distribution of residual was carried out. Since the sample size is larger than 50, Kolmogorov-Smirnov's test is applied (Jaramillo *et al.*, 2010). However, as shown in Table 10, the significant of

Kolmogorov-Smirnov's test (0.032) is less than 0.05, which indicates that normality could not be assumed.

As indicated by the boxplot (Figure 5), this problem is most likely due to cases numbered 28 and 174. Hence it is necessary to delete these 2 cases. Normality test was carried out immediately after the removal, Table 11 shows the result. From the result of p>0.05, the normality can now be assumed (Chong *et al*., 2009; Fatoki *et al*., 2010). As a result, 4 more cases were removed from the 230 qualified cases, giving 226 qualified cases in the end.

Table 7: Casewise Diagnostics[a]

Case Number	Std. Residual	BI	Predicted Value	Residual
64	-3.029	2.33	3.9894	-1.65603
129	-4.054	1.00	3.2164	-2.21643

a. Dependent Variable: BI

Table 8: Tests of Normality (before clearing outliers)

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	0.062	228	0.032	0.987	228	0.040

a. Lilliefors Significance Correction

Table 9: EFA Results

Variables	Items	Mean[b]	Std. Deviation	Factor loading[a]	A set of items	Eigen value	% of variance explained	Cumulative % of variance explained
IM		3.0619	0.8670		5	3.735	15.561	15.561
	IM2	2.9027	1.0453	0.840				
	IM3	2.9823	1.0412	0.835				
	IM1	3.0487	1.0121	0.822				
	IM5	3.0664	1.0067	0.772				
	IM4	3.3097	1.0335	0.740				
SI		3.1673	0.7981		5	3.207	13.364	28.925
	SI1	3.2345	0.9990	0.834				
	SI2	3.2035	1.0212	0.829				
	SI3	2.8982	1.0125	0.741				
	SI4	3.2345	1.0167	0.678				
	SI5	3.2655	1.0156	0.647				
PU		3.6350	0.6972		4	3.091	12.880	41.805
	PU3	3.6549	0.8194	0.853				
	PU4	3.5575	0.8373	0.778				
	PU1	3.7168	0.7420	0.778				
	PU2	3.6106	0.8212	0.729				
PE		3.8639	0.6316		4	2.967	12.363	54.168
	PE3	3.8628	0.7739	0.826				
	PE2	3.7301	0.7675	0.788				
	PE1	3.9381	0.6900	0.773				
	PE4	3.9248	0.7233	0.767				
PEOU		3.9336	0.6682		3	2.402	10.010	64.179
	PEOU1	3.9779	0.7569	0.890				

	PEOU3	3.9027	0.8106	0.822				
	PEOU2	3.9204	0.7136	0.798				
BI		3.8112	0.6898		3	2.302	8.468	72.646
	BI1	3.8850	0.8083	0.745				
	BI2	3.9956	0.7688	0.741				
	BI3	3.5531	0.8586	0.656				

Source: Developed for the research

Table 10: Demographic Profile of the Respondents

		Frequency	Percentage
Gender	Male	90	39.8
	Female	136	60.2
Age	17-22 years old	162	71.7
	23-28 years old	52	23.0
	29-34 years old	12	5.3
Highest Education	Below SPM	1	0.4
	SPM/ O-level	18	8.0
	STPM/ Foundation/ UEC/ A-level	74	32.7
	Diploma/ Advance Diploma	45	19.9
	Bachelor Degree	83	36.7
	Master Degree	4	1.8
	Others	1	0.4
Occupation	Student	171	75.7
	Self-employed	7	3.1
	Employed	44	19.5
	Unemployed	3	1.3
	Housewife	1	0.4
Marital Status	Single	215	95.1
	Married	11	4.9

Source: Developed for the research

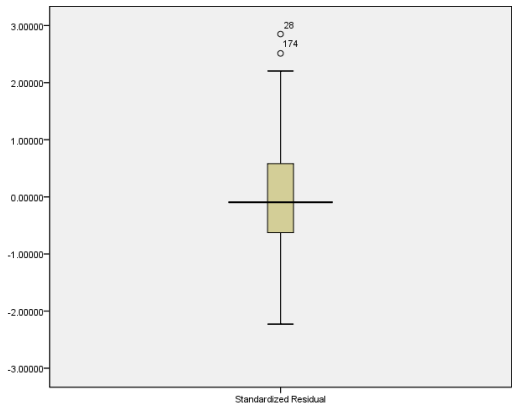

Figure 5: Boxplot Generated In Normality Tests

Table 11: Tests of Normality (after clearing outliers)

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	0.050	226	0.200*	0.987	226	0.032

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

4.3.2. Reliability test

Table 12 shows the reliability coefficients or Cronbach's alpha for every IV and DV. Overall, the reliability coefficients of all IVs and DV are strong and above the generally accepted criteria of 0.70 (Lai *et al*., 2011; Karim *et al*., 2006). From the result, it can be concluded that the questionnaire used for measuring adoption of TPs in this study is reliable.

Table 12: Reliability Statistics

Variables	Cronbach's Alpha	N of Items
PU	0.888	4
PEOU	0.851	3
IM	0.899	5
SI	0.847	5
PE	0.876	4
BI	0.806	3

4.3.3. Multicollinearty test

As indicated in the Table 16, there is no multicollinearity problem among all the IVs in this study as the highest correlation between IVs is less than 0.8 (Wei *et al*., 2009), which is 0.536 (correlation between PU and PE).

Besides, the multicollinearity statistics stated in Table 17 illustrates the value of tolerance and VIF for PU, PEOU, IM, SI, and PE. All the tolerance and VIF values are greater than 0.1 and less than 10 respectively. This result indicates that there is no threat of multicollinearity (Ott *et al*., 2011).

4.3.4. Linearity assumption

Figure 6 is the plot of standardised residuals against standardised predicted values. For the linearity assumption, as what has been displayed in the plot, the points are randomly and evenly dispersed throughout the plot, and the pattern of the dots is not in a curve shape.

Furthermore, this plot does not look like the plot in (c) and (d) of Figure 3, which are displaying the non-linearity pattern. Therefore, it could be concluded that the linearity assumption has been met by the regression model in this study.

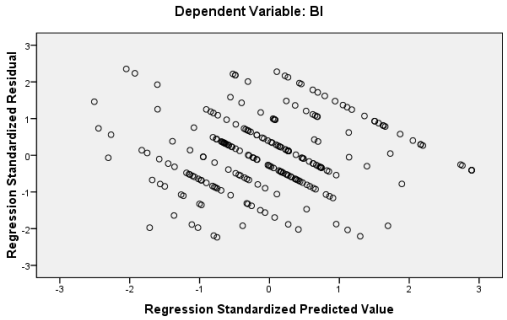

Figure 6: Plot of Standardised Residuals against Standardised Predicted Values

4.3.5. Homoscedasticity assumption

In the aspect of homoscedasticity assumption, the plot in Figure 6 does not have the pattern indicated in Figure 4, which shows the plot indicating the lack of homoscedasticity and the points are randomly and evenly dispersed throughout the plot. In addition, the plot is not similar to the plot in (b) and (d) of Figure 3, which show the situations where homoscedasticity has not been met. In conclusion, homoscedasticity assumption of the regression in this study could be met.

4.3.6. Independence assumption

Table 13 shows the Durbin-Watson statistic, which is one part of the multiple regression analysis result. From the result, the Durbin-Watson statistic is 2.051, which is close to 2. Hence, it can be concluded that there is no autocorrelation, which implies that independence assumption has been met (Matignon, 2005; Miles *et al*., 2001).

Table 13: Durbin-Watson Statistic[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.698[a]	0.487	0.475	0.49960	2.051

a. Predictors: (Constant), PE, SI, PEOU, IM, PU

b. Dependent Variable: BI

4.3.7. EFA

Table 14 displays the result for KMO measure and Bartlett's test of sphericity. The KMO measure of this study yields 0.875, which is above the minimum acceptable level of 0.5 (Leung *et al*., 2005). Furthermore, this high measure of KMO has also indicated that there are low correlations between pairs of variables when conditioning on one of several other variables, and the correlation could be explained by other variables.

Table 14: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.875
Bartlett's Test of Sphericity	Approx. Chi-Square	3,331.0928
	df	276
	Sig.	.000

Parinet, Lhot and Legub (2004) affirmed that the high measure of KMO, which is close to 1, would commonly signify that the factor analysis may be useful; while if the KMO measure is less than 0.5, the factor analysis would not be useful. Therefore, the high measure of KMO in this study, which is 0.875, allows further factor analysis to be conducted.

Bartlett's test of sphericity is significant in this study with chi-square of 3,331.0928 ($p<0.001$). Thus, the KMO measure of 0.875 and significance of Bartlett's statistic approve the suitability of the factor analysis for this study (Leung *et al*., 2005; Heijden *et al*., 2004; Chen *et al*., 2011).

The Kaiser's criterion of using eigen value more than 1.0 is used in this analysis. Factor loading for each item are sorted by size and shown in Table 7. All items are loaded on one and only one factor and having a factor loading value of greater than 0.5, hence none of the items is required to be removed from this study (Wei *et al*., 2009).

Table 15 illustrates that 24 items from 5 IVs and 1 DV are clustered into six components: Factor 1 (IM), Factor 2 (SI), Factor 3 (PU), Factor 4 (PE), Factor 5 (PEOU), and Factor 6 (BI) and sorted according to their own factor loading in their respective components.

The eigen value for the 6 factors, which are the IVs and DV in this study, have a value of more than 1.0 (3.735, 3.207, 3.091, 2.967, 2.402, 2.302). According to Wei et al. (2009), if the eigen value of a factor is more than 1.0, then this is indicating that the particular factor can explain more variance than a single variable. Furthermore, Considine and Martin (2005) suggested that eigen value is actually indicating "the amount of variance that can be explained by one factor within a pool of scale items" and the higher the eigen value is, the greater the variance can be explained by that factor.

The cumulative percentage of variance explained by the 6 factors is 72.646 per cent. In a simpler form of explanation, more than 70 per cent of the common variance shared by 24 items could be explained by these 6 factors. Hence, in accordance with the above results, the construct validity could be founded.

4.4. Inferential Analysis

4.4.1. Pearson correlation analysis

As indicated in the Table 16, all the associated pairs of variables are significant at level 0.01, except the correlation between IM and PEOU, and SI and PEOU are significant at level 0.05. All the hypothesized assumptions are statistically significant at level $p < 0.01$. The analysis result implies that PU ($r = 0.519$, $p < 0.01$), PEOU ($r = 0.307$, $p < 0.01$), IM ($r = 0.484$, $p < 0.01$), SI ($r = 0.475$, $p < 0.01$) and PE ($r = 0.531$, $p < 0.01$) are all positively and significantly correlated with BI.

In this research, among all the correlations between IVs and BI (DV), the correlation between PE and BI is the strongest ($r = 0.531$, $p < 0.01$). This is followed up by the correlation between PU

and BI (r = 0.519, p < 0.01) as well as the correlation between IM and BI (r = 0.484, p < 0.01).

Table 15: Correlations between Variables

	PU	PEOU	IM	SI	PE	BI
PU	1					
PEOU	0.440**	1				
IM	0.393**	0.132*	1			
SI	0.216**	0.153*	0.422**	1		
PE	0.536**	0.375**	0.310**	0.295**	1	
BI	0.519**	0.307**	0.484**	0.475**	0.531**	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4.4.2. Multiple regression analysis

Table 17 indicates the result of multiple regression analysis. The fitness for the model employed in this study can be assured and confirmed, as the F-statistics produced (F=47.394) was significant at 1 percent level (Sig. of F <0.01). Hence, there is a statistically significant relationship between all the IVs and the BI to adopt TPs in the model employed by this study.

In addition, the R^2 value is determined at 48.7 per cent, which suggests that the 5 IVs in the model could significantly account for 48.7 per cent in BI to adopt TPs. In other words, almost 50 per cent of the variance in BI of GY to adopt TPs in Malaysia could be significantly explained by the 5 IVs of adoption factors, namely PU, PEOU, IM, SI, and PE.

According to Table 17, PU (p<0.001), IM (p=0.001), SI (p<0.001), and PE (p<0.001) are all significantly affecting the BI of GY to adopt TPs in Malaysia. From the multiple regression analysis, PU, IM, SI, and PE are the important adoption factors that affect the BI of GY to adopt TPs in Malaysia. Among these IVs, SI is the strongest determinant.

IM is found to be the least important adoption factor in this study, but IM is still significant in explaining the BI of GY to adopt TPs. Unlike PEOU (p=0.409), it has been found that this adoption factor is not significantly associated with BI to adopt TPs.

Table 16: Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
IM2	0.840					
IM3	0.835					
IM1	0.822					
IM5	0.772					
IM4	0.740					
SI1		0.834				
SI2		0.829				
SI3		0.741				
SI4		0.678				
SI5		0.647				
PU3			0.853			
PU4			0.778			
PU1			0.778			
PU2			0.729			
PE3				0.826		
PE2				0.788		
PE1				0.773		
PE4				0.767		
PEOU1					0.890	

PEOU3	0.822		
PEOU2	0.798		
BI1			0.745
BI2			0.741
BI3			0.656

Notes: Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 6 iterations.

Table 17: Multiple Regression Analysis[a]

Independent Variables	Beta	t-value	Sig.	Hypothesis	Supported / Not Supported	Collinearity Statistics	
						Tolerance	VIF
(Constant)	0.540	2.103	0.037	-	-	-	-
PU	0.229	3.652	0.000	H1	Supported	0.590	1.694
PEOU	0.045	0.828	0.409	H2	Not Supported	0.772	1.295
IM	0.200	3.508	0.001	H3	Supported	0.719	1.392
SI	0.260	4.782	0.000	H4	Supported	0.788	1.268
PE	0.252	4.224	0.000	H5	Supported	0.656	1.526

Notes: Overall model F = 41.782， Sig. of F ($p < 0.01$)， $R^2 = 0.487$， adjusted $R^2 = 0.475$
a. Dependent Variable: BI

5. DISCUSSIONS, CONCLUSION AND IMPLICATIONS

5.1. Discussions of Major Findings

5.1.1. Perceived usefulness

PU was found to be one of the significant predictors of BI and there is an existence of positive relationship among them. This result supports and is consistent with some past researches relating to m-commerce (Jayasingh & Eze, 2009; Faziharudean & Tan, 2011) and e-commerce (Yaghoubi & Bahmani, 2010).The result shows that GY would only adopt TP when they find it useful, thus the adoption rate of TPs will increase if GY finds that TPs would bring them more practical benefits, compared to using traditional phones. The rational as to why GY finds that TPs are useful is possibly because of the touchscreen technology, which is the unique characteristic of TPs.

TPs can be operated just by tapping on the screen, which is convenient and useful enough for GY to interact with their TPs in a faster speed, compared to traditional phones. For example, unlike any other traditional phones, iPhone 4 allows users to focus on anything they wish to focus on when they are taking photos, such as a face in the background, simply by a tap on the screen (Apple, 2011).

In conclusion, the more useful features TPs can provide through touch screen technology, which the traditional phones are lacking of, the more useful GY perceives TPs would be and hence increase their BI to adopt TPs.

5.1.2. Perceived ease of use

PEOU is proven to be insignificant in explaining the BI of GY. However, there is a positive relationship between PEOU and BI. This result contradicts to prior researches (Suki, 2011; Ramayah *et al*., 2005), which suggested that PEOU have positive influence and significant effect on the BI. Nevertheless, the result yielded is the same as the result in the study of m-commerce adoption (Cho, Kwon & Lee, 2007; Yan, Khalil, Emad & Sutanonpaiboon, 2009), which have proven that although PEOU is positively associated with BI, but PEOU is insignificant in explaining the BI.

PEOU is found to have insignificant effect in affecting the BI of GY in adopting TPs in this study. This is probably due to the fact that people from GY (between age of 17 and 33) are still young. As mentioned earlier, other than having mobile phones throughout their lives, people from this generation are also grown up with technology and hence they are somehow technologically savvy (Schlitzkus *et al*., 2010; Djamasbia *et al*., 2010; Nusair *et al*., 2011). Hence, they might have a good understanding on how to use and operate the technology.

Thus, GY would adopt TPs, regardless of the ease of use of TPs. In conclusion, it is possible that TPs could be learned easily by this generation and hence PEOU has no significant influencing power on their BI to adopt TPs.

5.1.3. Image

IM has been proven to be positively and significantly affecting the BI of GY to adopt TPs in this study. This result is coherent with the some previous studies such as the study of e-Government adoption (Carter *et al*., 2004; Hussein, *et al*., 2010), E-MBA program adoption (Mahmod, Dahlan, Ramayah, Karia & Asaari, 2005), and internet adoption (Omoush & Shaqrah, 2010).

As mentioned earlier on, Malaysians are somehow kiasu (Lee, 2007; Joseph, 2006), they like to show off to each other about their superior status and demonstrate that they are better than others. Furthermore, Williams, Page, Petrosky and Hernandez (2010) claimed that GY is image-driven. Due to these facts, most probably GY perceives that by owning a TP, they could have more prestige over those who do not own a TP, and their social status would then be enhanced.

Therefore, they find that in order to maintain their social status in their social networks, they have to adopt a TP. Consequently, the high desire to enhance social status directly affects the BI of GY in adopting TPs.

5.1.4. Social influence

In the context of this study, SI has a positive and significant association with BI. This validates the past researches on m-commerce (Shin, 2007; Kim *et al*., 2009; Wei *et al*., 2009), which also report that SI has a positive and significant association with BI.

This is possibly due to the fact that GY (between age of 17 and 33) is the target respondents of this study. This generation of people are likely to make their decision on the foundation of the influence from their own peers (McCrindle, 2005).

McCrindle (2005) further emphasized that the choices being made by GY are generally affected by the experiences of their own core group, which usually consisted of 3 to 8 friends. Other than that, as mentioned earlier, Malaysia is a strong family based society (Sani *et al.*, 2009) and family decision has important role in influencing consumers purchasing behaviour (Jung *et al*., 2004). From the illustration of these points, it is crystal clear that BI of GY in Malaysia to adopt TPs is easily influenced by their peers and family members.

5.1.5. Perceived enjoyment

Furthermore, the association between PE and BI has also been proven as positive and significant in this study. This result is not surprising as it is backed by several past studies on SMS adoption (Lu *et al*., 2010), instant messaging adoption (Li *et al*., 2005), and hedonic information system adoption (Heijden, 2004).

The result shows that BI of GY to adopt TPs would only increase if they find that using TPs is entertaining and enjoying. This is perhaps due to the fact that GY focuses on fun, entertainment, and flexibility (Knox *et al*., 2009). It is common to see youngsters play games by using their mobile phones. However, traditionally, they play games by using the keypad on the phones. Playing games by using TPs is somehow more entertaining than using phones with keypad. Hence, it makes sense that why PE is one of the significant factors in affecting BI of GY to adopt TPs.

5.2. Implications of the Study

5.2.1. Practitioner implications

It has been proven that customer satisfaction could positively affect customer loyalty (Flint, Blocker & Boutin, 2011) and customer's willingness to pay for the product (Homburg, Koschate & Hoyer, 2005). Dacko (2008) advocated that customer loyalty could bring increased profits. This is so because the spending of customers would be greater and the operating costs associated with serving loyal customers would be lower.

It is important for TP manufacturers to understand the factors that significant in explaining the BI of GY to adopt TPs in Malaysia, so that these manufacturers can attract customers to adopt their TPs and this would give them a chance to delight their customers and create customer satisfaction with their products.

Since PU is one of the important predictors of the BI of GY to adopt TPs, therefore TP manufacturers should have considered this factor deeply when they are trying to come out with new models of TP. Manufacturers should invent more useful features and blend them with the touchscreen technology, to make the TPs become more useful. For example, users can simply touch on the screen to take photos, or use they finger to operate the zoom in and zoom out features.

PEOU is insufficient in explaining the BI of GY in the adoption of TPs; therefore TP manufacturers could ignore this factor when they are developing a new model of TP.

Moreover, this study also suggests that IM is important in influencing the BI of GY. In view of this, TP manufacturers should create their own brand images. Brand image is "the total picture of how others think of a brand" (Wilson & Blumenthal, 2008). According to O'Shaughnessy (1995), brand image consists of the impressions that can be brought to mind by the brand itself; and it could be built up based on the brand's physical attributes (including its packaging and logo), word-of-mouth communication, advertising, and experience in using the products. Ultimately, TP manufacturers should create a brand image which everyone perceives that by owning the TPs manufactured by them could enhance one's social status, and this eventually could attract GY to adopt their TPs.

Since SI is the strongest determinant of the BI of GY to adopt TPs, it is also suggested that TP manufacturers should build customer loyalty by satisfying their customers with various models of TP. Eventually TP manufacturers could attract more and more customers, because loyal customers would definitely influence their friends, peers, and family members through word-of-mouth communication. As noted by Reilly (2002), loyal and satisfied customers would return and bring their friends too.

It is important for TP manufacturers to consider PE seriously, as this factor is significant in affecting the BI of GY to adopt TPs. The phone models developed by TP manufacturers should able to bring enjoyment to GY, in order to make sure the adoption rate is good. TP manufacturers could also try to invent some features that could bring enjoyment to users and blend them with the touchscreen technology. For example, when recording video, users can simply touch on any spot on the screen to focus the point where they intended to focus.

5.2.2. Scholars implications

Other than the implications for practices, this study also provides a few implications for scholars too. This study has successfully ascertained the factors that affecting the BI of GY to adopt TPs in Malaysia, by extending the TAM. As the fitness of model employed in this study has been confirmed, thus it could be claimed that TAM has been successfully extended in the context of TP, through incorporating IM, SI, and PE into it.

In addition, the extended TAM also aids in achieving better understanding on GY's acceptance of TPs in Malaysia as almost 50 per cent of the BI of GY to adopt TPs in Malaysia could be explained by the model. Furthermore, this study also proved that TAM is adoptable in technology adoption studies since the model in this study has explanatory power.

5.3. Limitations and Recommendations

As this study is conducted only in Malaysia, therefore the result yielded might be slightly different if this study is performed in other countries. Future studies could be conducted in different country's context, and scholars could try to incorporate national culture as moderating factor into their research models. As proposed by Yoon (2009), the differences in national culture can affect customer BI. Choi and Totten (2011) further asserted that cultural values have been discovered to affect consumer behaviour through several means. Therefore, it is noteworthy to see the effect of this moderating factor on BI of GY in different country.

Moreover, the target respondent of this study is focused only on GY; therefore the result obtained might not be the same if the target respondent is changed to other generations, such as generation X

and Z. For example, those who are in elder age range might find that TPs are difficult to operate and thus PEOU might become a significant factor in predicting the BI of them. Therefore, in future studies, researchers should expand their target respondents in term of age group. Moreover, it is also interesting to do a comparison study between different age group users in future studies, to see whether difference in age influences the BI to adopt TPs.

Besides, this study is using the cross-sectional approach, which only takes place at a single point in time (Trochim, 2006) and looks at a particular phenomenon at a specific time (Saunders *et al*., 2009). It is highly recommended that future studies to be conducted using longitudinal approach which studies an event at more than one point in time. In other words there is more than one period of data collection (Bowling & Ebrahim, 2005). Hedeker and Gibbons (2006) further claimed that longitudinal data could deliver information about individual change, which cannot be provided by cross-sectional data. In view of these, in future studies, scholars could try to measure the BI of those who have no experience in using TPs in the first place. These respondents shall later be allowed to try out TPs for the first time ever in their lives, then BI shall be measured again immediately after their exposure to TPs. It is interesting to know whether there is any difference in BI to adopt TPs between the pre-exposure and post-exposure periods.

In addition, the R^2 of the model is at the moderate level (R^2=0.487). As noted by Weil, Frank, Hughes and Wagner (2007), the R^2 ranges from 0 to 1, where 0 signifies that the model explains none of the variation in the DV; and vice versa. Moreover, Mezick (2007) provided that the R^2 value ranges from 0.04 to 0.24 is considered weak, while a range from 0.25 to 0.64 is considered moderate. Hence, there is still much room for improvement. According to Weil *et al*. (2007), R^2 indicates the predictive power of the model in the frame of given sample. Therefore, the predictive power of the model employed in this study is somehow less powerful. Weil et al. (2007) pointed out that addition of variables to the model would normally increase the R^2. Therefore in future studies, researchers could try to include more variables into the model employed by this study, such as perceived cost (Pagani, 2004; Carlsson, Walden & Bouwman, 2006). However, it is also important to note that maximizing the R2 is not one of the regression analysis' objectives; therefore the acceptance and rejection of the model should not be based solely on the value of R^2 (Weil *et al*., 2007). Therefore, researchers should not blindly add in more variables just for the sake of maximizing the R^2.

Furthermore, the sample size of this study is small. As mentioned by Gravetter and Wallnau (2008), the sample size influences how correctly the sample represents the population; and large sample should be more precise than small sample. It is highly recommended for future researchers to increase the sample size, as larger sample should be more accurate in representing the whole population (Gravetter *et al*., 2008).

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