

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

BY

ENG SHAO WEI  
HEW JUN JIE  
KOO XI MIN  
SOO LYN NI  
TAN YEE SIM

A research project submitted in partial fulfillment of the  
requirement for the degree of

BACHELOR OF COMMERCE (HONS) ACCOUNTING

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE  
DEPARTMENT OF COMMERCE & ACCOUNTANCY

AUGUST 2011

---

Copyright © 2011

ALL RIGHTS RESERVED. No part of this paper may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, graphic, electronic, mechanical, photocopying, recording, scanning, or otherwise, without the prior consent of the authors.

## 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 project is 10,844.

Name of Student:	Student ID:	Signature:
1. Eng Shao Wei	09ABB01934	
2. Hew Jun Jie	09ABB01740	
3. Koo Xi Min	09ABB01935	
4. Soo Lyn Ni	09ABB01526	
5. Tan Yee Sim	09ABB01898	

Date: 5<sup>th</sup> August 2011

## ACKNOWLEDGMENTS

We would like to thank our beloved supervisor, Ms Shirley Lee Voon Hsien for all her guidance and help all along the way in this research project. We would also like to thank our parents for their endless love and support. Last but not least, grateful thanksto all of the people who had assisted us in this project.

## DEDICATION

This research project is dedicated to our lovely and beloved supervisor, Ms Shirley Lee Voon Hsien, friends, and families. Without their sincere and boundless support, it would be impossible for us to achieve the completion of this project.

TABLE OF CONTENTS

		Page
Copyright Page .....		ii
Declaration .....		iii
Acknowledgements .....		iv
Dedication .....		v
Table of Contents .....		vi
List of Tables .....		xi
List of Figures .....		xii
List of Appendices .....		xiii
List of Abbreviations .....		xiv
Preface .....		xvi
Abstract .....		xvii
CHAPTER 1	INTRODUCTION .....	1
1.0	Introduction .....	1
1.1	Research Background .....	1
1.2	Problem Statement .....	2
1.3	Research Questions and Objectives .....	3
1.4	Significance of the Study .....	4

---

1.5	Outline of the Study .....	4
1.6	Conclusion .....	5
CHAPTER 2	LITERATURE REVIEW .....	6
2.0	Introduction .....	6
2.1	TAM .....	6
2.2	Review of the Prior Empirical Studies .....	8
	2.2.1 Perceived Usefulness .....	8
	2.2.2 Perceived Ease of Use .....	9
	2.2.3 Image .....	10
	2.2.4 Social Influence .....	11
	2.2.5 Perceived Enjoyment .....	13
2.3	Factors Affecting the Adoption of Touchscreen Phones .....	14
2.4	Hypotheses Development .....	15
2.5	Conclusion .....	15
CHAPTER 3	RESEARCH METHODOLOGY .....	16
3.0	Introduction .....	16
3.1	Research Design .....	16
3.2	Data Collection Methods .....	17
	3.2.1 Primary Data .....	17
3.3	Sampling Design .....	17
	3.3.1 Target Population .....	17

---

3.3.2	Sampling Location .....	17
3.3.3	Sampling Elements .....	18
3.3.4	Sampling Technique .....	18
3.3.5	Sampling Size .....	19
3.4	Research Instrument .....	19
3.5	Variables and Measurement .....	21
3.6	Data Processing .....	22
3.7	Data Analysis .....	22
3.7.1	Descriptive Analysis .....	22
3.7.2	Scale Measurement .....	23
3.7.2.1	Reliability Test .....	23
3.7.2.2	EFA .....	23
3.7.2.3	Multicollinearity Analysis .....	24
3.7.3	Inferential Analysis .....	24
3.7.3.1	Pearson Correlation Analysis .....	24
3.7.3.2	Multiple Regression Analysis .....	25
3.8	Conclusion .....	29
CHAPTER 4	DATA ANALYSIS .....	30
4.0	Introduction .....	30
4.1	Descriptive Analysis .....	30
4.1.1	Demographic Profile of the Respondents .....	30



	4.1.2	Central Tendencies Measurement of Constructs .....	31
4.2		Scale Measurement .....	31
	4.2.1	Normality Assumption .....	31
	4.2.2	Reliability Test .....	34
	4.2.3	Multicollinearty Test .....	35
	4.2.4	Linearity Assumption .....	35
	4.2.5	Homoscedasticity Assumption .....	36
	4.2.6	Independence Assumption .....	37
	4.2.7	EFA .....	37
4.3		Inferential Analysis .....	39
	4.3.1	Pearson Correlation Analysis .....	39
	4.3.2	Multiple Regression Analysis .....	40
4.4		Conclusion .....	42
CHAPTER 5		DISCUSSIONS, CONCLUSION AND IMPLICATIONS ...	43
5.0		Introduction .....	43
5.1		Summary of Statistical Analysis .....	43
5.2		Discussions of Major Findings .....	44
	5.2.1	Perceived Usefulness .....	44
	5.2.2	Perceived Ease of Use .....	45
	5.2.3	Image .....	45
	5.2.3	Social Influence .....	46

5.2.5	Perceived Enjoyment .....	47
5.3	Implications of the Study .....	48
5.3.1	Practitioner Implications .....	48
5.3.2	Scholars Implications .....	50
5.4	Limitations of the Study and Recommendations .....	50
5.5	Conclusions .....	52
	References .....	53
	Appendices .....	65

## LIST OF TABLES

	Page
Table 1.1: General Research Question and General Research Objective	3
Table 1.2: Specific Research Questions and Specific Research Objectives	3
Table 3.1: Reliability Statistics (Pilot Test)	20
Table 3.2: Measurement of Each Variable	21
Table 4.1: Casewise Diagnostics	32
Table 4.2: Tests of Normality (before clearing outliers)	32
Table 4.3: Tests of Normality (after clearing outliers)	34
Table 4.4: Reliability Statistics	35
Table 4.5: Durbin-Watson Statistic	37
Table 4.6: KMO and Bartlett's Test	38
Table 4.7: Correlations between Variables	40
Table 4.8: Multiple Regression Analysis	41

LIST OF FIGURES

	Page
Figure 2.1: Original TAM	7
Figure 2.2: Research Model	14
Figure 3.1: Plot Indicating the Linearity and Homoscedasticity	27
Figure 3.2: Plot Indicating the Lacking of Homoscedasticity	28
Figure 4.1: Boxplot Generated In Normality Tests	33
Figure 4.2: Plot of Standardised Residuals against Standardised Predicted Values	36

LIST OF APPENDICES

	Page
Appendix 2.1: Summary of Past Empirical Studies on PU – BI	65
Appendix 2.2: Summary of Past Empirical Studies on PEOU – BI	66
Appendix 2.3: Summary of Past Empirical Studies on IM – BI	67
Appendix 2.4: Summary of Past Empirical Studies on SI – BI	68
Appendix 2.5: Summary of Past Empirical Studies on PE – BI	69
Appendix 3.1: Definition for Each Variable	70
Appendix 3.2: Sources of Variables	71
Appendix 3.3: Questionnaire	73
Appendix 3.4: Permission Letter to Conduct Survey	77
Appendix 4.1: Demographic Profile of the Respondents	78
Appendix 4.2: EFA Results	79
Appendix 4.3: Skewness Measurement of All Items	80
Appendix 4.4: Rotated Component Matrix	81

LIST OF ABBREVIATIONS

BI	Behaviour Intention
DV	Dependent Variable
EFA	Exploratory Factor Analysis
GY	Generation Y
IM	Image
IT	Information Technology
IV	Independent Variable
KMO	Kaiser-Meyer-Olkin
MBA	Master of Business Administration
MMS	Multimedia Message Service
PCA	Principal Component Analysis
PE	Perceived Enjoyment
PEOU	Perceived Ease of Use
PU	Perceived Usefulness
R <sup>2</sup>	Coefficient of Determination
SI	Social Influence
SMS	Short Message Service
SPSS	Statistical Package for Social Science

TAM	Technology Acceptance Model
TP	Touchscreen Mobile Phone
VIF	Variance-Inflation Factor

## PREFACE

Most people especially Generation Y nowadays are holding touchscreen phones in their hands, instead of the phones with keypad. Moreover, many of the hand phone retail shops are also displaying more touchscreen phones compared to traditional phones in their showcases; this directly shows that customers nowadays prefer touchscreen phones. Hence, the issue of why Generation Y is more willing to choose touchscreen phones, rather than traditional phones would be an interesting topic for in depth investigation.



## ABSTRACT

This research project intends to examine empirically the factors that affect the BI of GY to adopt TPs in Malaysia. The five factors examined are PU, PEOU, IM, SI, and PE. 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 project 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 study 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 project 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 project, therefore the findings also concluded that TAM could be adopted in technology adoption study.

## **CHAPTER 1: INTRODUCTION**

### **1.0 Introduction**

This chapter aims to discuss on the background of the study, lay down the problem statement, determine the research objectives and questions, and provide the significance of this study.

### **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 1.1 shows the general research question and general research objective; and Table 1.2 displays the specific research questions and specific research objectives.

Table 1.1: General Research Question and General Research Objective

<b>General Research Question</b>	<b>General Research Objectives</b>
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.

Source: Developed for the research

Table 1.2: Specific Research Questions and Specific Research Objectives

<b>Specific Research Questions</b>	<b>Specific Research Objectives</b>
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).

Source: Developed for the research

## **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.

## **1.5 Outline of the Study**

Past literature review and development of hypotheses are to be done in Chapter 2, while Chapter 3 would discuss on research's design; data collection method; sampling method; measurement of the variables; data processing and data analysis method. Moreover, the main theme of Chapter 4 is data analysis. The last but not the least, major findings, implications and limitations of this research project, recommendations for future research study are delivered in Chapter 5.

## **1.6 Conclusion**

After determined the problem statement, research questions and objectives, this study aims to ascertain the factors influencing the adoption of TPs among GY, in order to contribute to TP manufacturers and scholars. Chapter 2 would then provide the relevant literature review.

## **CHAPTER 2: LITERATURE REVIEW**

### **2.0 Introduction**

After listing the research background, problem statement, research questions and objectives, and significance of this study in Chapter 1, this chapter aims to provide the relevant 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.

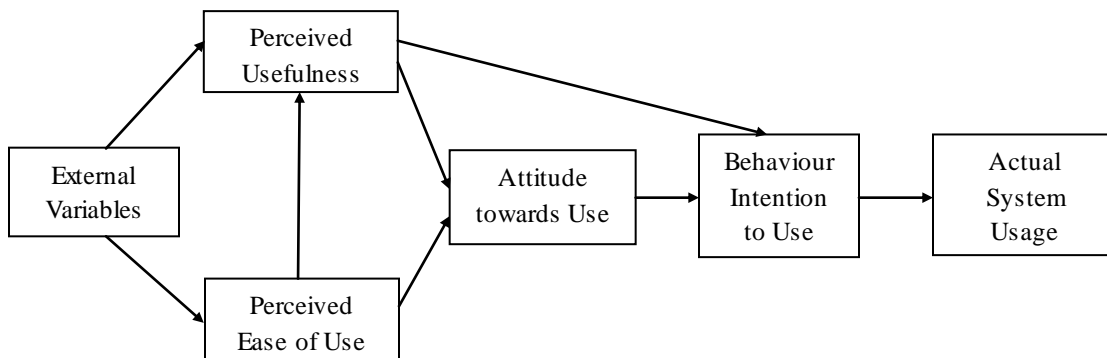
TAM has been widely used in researches about various information services, technology products and other innovations. For instance, Benamati and Rajkumar (2002) applied the TAM to explain outsourcing decision of information system. Pavlou (2003) used the TAM to evaluate users' acceptance of e-commerce.

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 (as in Figure 2.1) and the research model employed in this study (as in Figure 2.2). 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 2.1: 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.

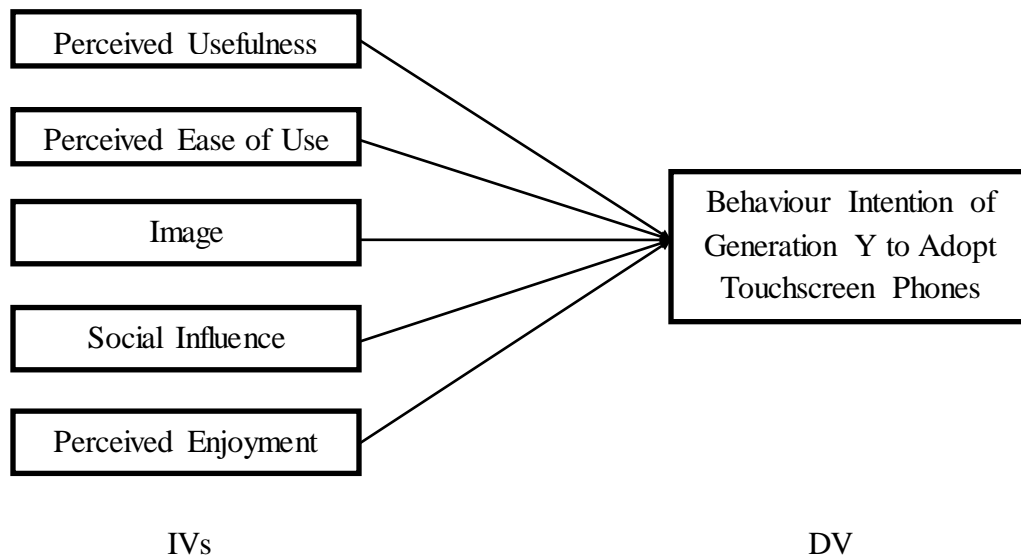
According to Li *et al.* (2005) who studied about individual adoption of instant messaging, PE is positively associated with BI to use instant messaging. The population for their cross-cultural study was made up of US and China internet users. Undergraduates from two US Midwestern universities and graduates 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 2.2: 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.

## **2.5 Conclusion**

Review of past studies was provided in this chapter. From the past studies review, the research model and hypotheses were developed. The research methodology would then be provided in Chapter 3.



## **CHAPTER 3: RESEARCH METHODOLOGY**

### **3.0 Introduction**

After developing the research model and hypotheses from the past studies review in Chapter 2, this chapter aims to describe the research design, data collection methods, sampling design, research instrument, variables and measurement, data processing procedure, and data analysis techniques.

### **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 Data Collection Methods**

### **3.2.1 Primary Data**

Questionnaire survey was used to collect the primary data from target respondents.

## **3.3 Sampling Design**

### **3.3.1 Target Population**

The population for this research study is GY in Malaysia, particularly those who have experience in using TPs.

### **3.3.2 Sampling Location**

The sampling location is over the internet, as internet mediated questionnaire was utilised to collect the primary data.

### 3.3.3 Sampling Elements

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.

### 3.3.4 Sampling Technique

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.

### **3.3.5 Sampling Size**

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.

## **3.4 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 3.1 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.

Table 3.1: 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

Source: Developed for the research

### 3.5 Variables and Measurement

Refer to Appendix 3.1 for the definitions of each variable; Appendix 3.2 for the sources of variables. Table 3.2 displays the measurement used for each variable.

Table 3.2: Measurement of Each Variable

Variables		Measurement	Scale of Measurement
Demographic Profile	Gender	Nominal	
	Age	Ordinal	
	Highest education completed	Ordinal	
	Occupation	Nominal	
	Marital Status	Nominal	
	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
	Behaviour Intentions	Interval	5-point Likert scale

Source: Developed for the research

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).

### **3.6 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 4.2.1. In the end, there are only 226 cases left.

### **3.7 Data Analysis**

SPSS 16.0 for windows was used to analyse the data collected.

#### **3.7.1 Descriptive Analysis**

Mean and standard deviation of every item in the questionnaire would be calculated and presented. Furthermore, demographic characteristics of the respondents are presented too in section 4.1.

## **3.7.2 Scale Measurement**

### **3.7.2.1 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.

### **3.7.2.2 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.

### **3.7.2.3 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).

## **3.7.3 Inferential Analysis**

### **3.7.3.1 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).

### **3.7.3.2 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.

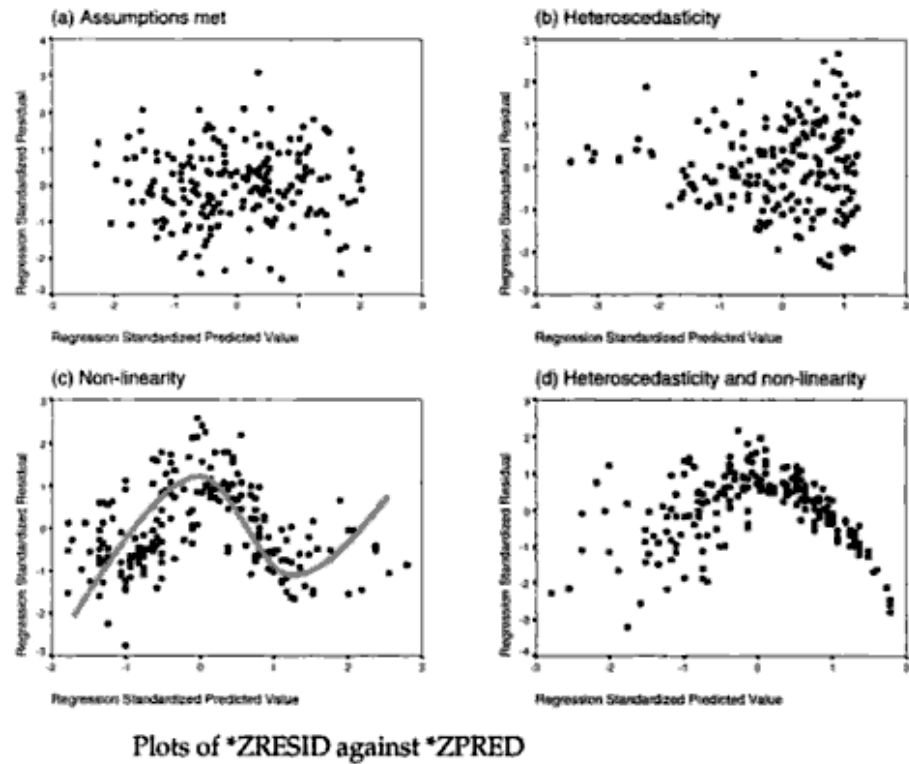
Sapp (2006) concludes that multiple regression has 4 assumptions, namely linearity; homoscedasticity of variance (a.k.a. homoscedasticity or homogeneity of variance); normality; and independence of error terms. Hence, these assumptions of multiple regression analysis would also be tested.

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).

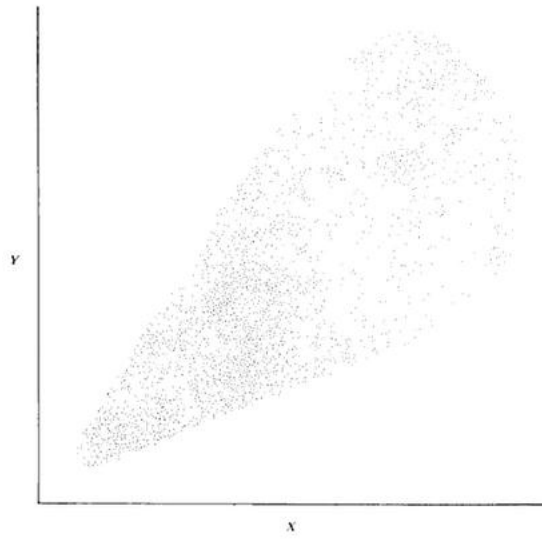
Figure 3.1: Plot Indicating the Linearity and Homoscedasticity



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

Figure 3.1 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 3.2 symbolizes the situation where homoscedasticity has not been met.

Figure 3.2: Plot Indicating the 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).

## **3.8 Conclusion**

The research methodology and data analysing techniques were provided in this chapter. Chapter 4 would then provide the result yielded from the survey.

## **CHAPTER 4: DATA ANALYSIS**

### **4.0 Introduction**

After describing the research methodology and data analysing techniques Chapter 3, this chapter aims to explain and provide the result yielded from the survey, by providing the descriptive analysis and the results of data analysis.

### **4.1 Descriptive Analysis**

#### **4.1.1 Demographic Profile of the Respondents**

The demographic profile of the surveyed respondents is presented in Appendix 4.1. 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.

### **4.1.2 Central Tendencies Measurement of Constructs**

Mean and standard deviation of the variables were computed in Appendix 4.2. 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 Appendix 4.2. 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 Scale Measurement**

### **4.2.1 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 4.1), 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.



Table 4.1: Casewise Diagnostics<sup>a</sup>

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

Source: Developed for the research

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

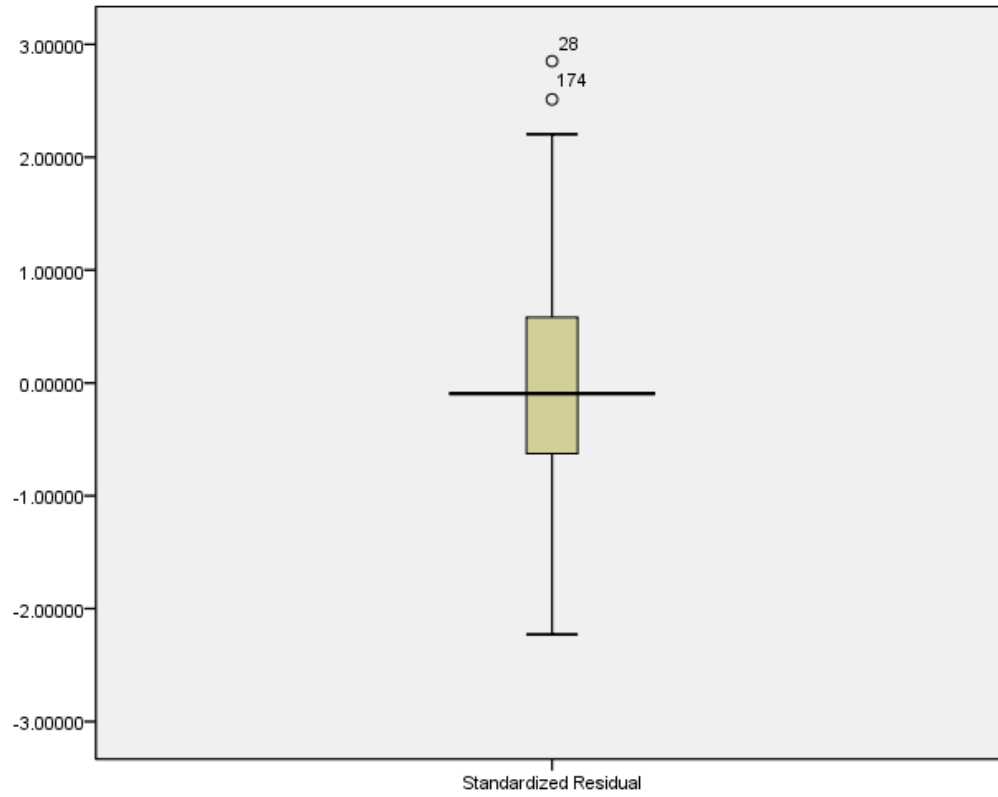
Table 4.2: Tests of Normality (before clearing outliers)

	Kolmogorov-Smirnov <sup>a</sup>			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	0.062	228	0.032	0.987	228	0.040

a. Lilliefors Significance Correction

Source: Developed for the research

Figure 4.1: Boxplot Generated In Normality Tests



Source: Developed for the research

As indicated by the boxplot (Figure 4.1), which is part of the results in the normality test, 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 4.3 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 4.3: Tests of Normality (after clearing outliers)

	Kolmogorov-Smirnov <sup>a</sup>			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.

Source: Developed for the research

Other than Kolmogorov-Smirnov's test, the skewness for all the data is also used to judge the normality assumption. From Appendix 4.3, the measures of skewness for all data are ranged from -0.770 to 0.196. Since the measures of skewness for all items are ranged between -1.0 and 1.0 after taking into consideration the standard error of skewness, then the distribution of data does not depart from normality (Raston, Awang, & Hamzah, 2010). Overall, based on the two methods prescribed, the normality of the data can be assumed.

#### 4.2.2 Reliability Test

Table 4.4 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 4.4: 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

Source: Developed for the research

### 4.2.3 Multicollinearity Test

As indicated in the Table 4.7, 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).

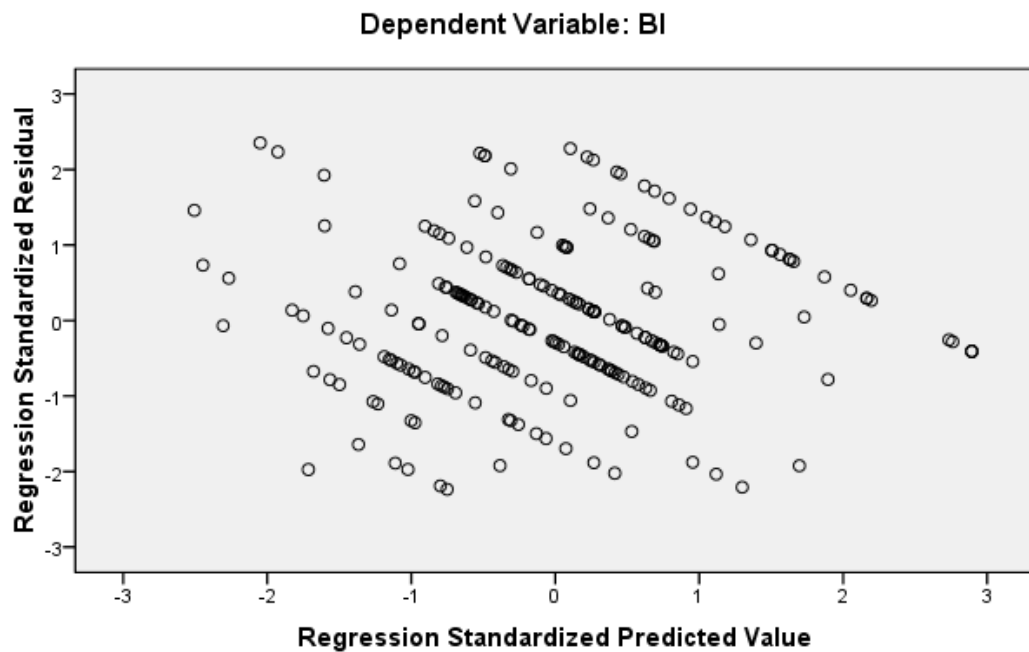
Besides, the multicollinearity statistics stated in Table 4.8 illustrates the value of tolerance and VIF for PU, PEOU, IM, SI, and PE. All the tolerance and VIF values are greater than 0.1 and less than 10 respectively. This result indicates that there is no threat of multicollinearity (Ott *et al.*, 2011).

### 4.2.4 Linearity Assumption

Figure 4.2 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 3.1, 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 4.2: Plot of Standardised Residuals against Standardised Predicted Values



Source: Developed for the research

#### **4.2.5 Homoscedasticity Assumption**

In the aspect of homoscedasticity assumption, the plot in Figure 4.2 does not have the pattern indicated in Figure 3.2, 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 3.1, which show the situations where homoscedasticity has not been met. In conclusion, homoscedasticity assumption of the regression in this study could be met.

#### 4.2.6 Independence Assumption

Table 4.5 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 4.5: Durbin-Watson Statistic<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.698 <sup>a</sup>	0.487	0.475	0.49960	2.051

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

b. Dependent Variable: BI

Source: Developed for the research

#### 4.2.7 EFA

Table 4.6 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 4.6: 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

Source: Developed for the research

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 Appendix 4.2. 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).

Appendix 4.4 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.

## **4.3 Inferential Analysis**

### **4.3.1 Pearson Correlation Analysis**

As indicated in the Table 4.7, 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 4.7: 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).

Source: Developed for the research

### 4.3.2 Multiple Regression Analysis

Table 4.8 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 4.8, 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.

The equation of the model employed in this study can be written as:

$$BI = 0.540 + 0.229 PU + 0.045 PEOU + 0.200 IM + 0.260 SI + 0.252 PE$$

Table 4.8: Multiple Regression Analysis<sup>a</sup>

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

Source: Developed for the research

## **4.4 Conclusion**

This chapter provided the demographic profile of the target respondent the results from different data analysis. Chapter 5 would then provide the major findings, implications, and limitation of this study. Recommendations for future research would also be made in Chapter 5.

## **CHAPTER 5: DISCUSSIONS, CONCLUSION AND IMPLICATIONS**

### **5.0 Introduction**

After listed out the demographic profile of target respondents and the result of the data analysis in Chapter 4, this chapter aims to provide major findings, implications, and limitation of this study. Recommendations for future research would also be made in this chapter.

### **5.1 Summary of Statistical Analysis**

A total of 295 respondents took part in the survey, but only 230 are useful cases. Thus the total respond rate yielded was 77.97 per cent. The majority of respondent are female and they are generally belonging to the age group of 17-22 years old. Moreover, most of the target respondent is still pursuing their studies.

The mean of all the variables are within the range of 3.000 to 3.999, whereas the standard deviations of all of the variables are less than 1. In the aspect of questionnaire items, the mean of all the items are within the range of 2.8000 to 3.9999, while the lowest and highest standard deviations are 0.7136 and 1.0453 respectively.

The standardised residual of the DV is normally distributed and the questionnaire used for measuring adoption of TPs in this study is reliable. All the IVs are positively correlated with BI, and PE is the strongest determinant among the 5 IVs. All the assumptions for performing multiple regression analysis have been fulfilled, and the

result of multiple regression analysis shows that all the IV are significantly affecting the BI of GY to adopt TPs, except for PEOU.

## **5.2 Discussions of Major Findings**

### **5.2.1 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 rationale 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.

### 5.2.2 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; Djamashbia *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.

### 5.2.3 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.

### **5.2.3 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 (McCrinkle, 2005).

McCrinkle (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.

### **5.2.5 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.



## **5.3 Implications of the Study**

### **5.3.1 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 be 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.

### **5.3.2 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.

## **5.4 Limitations of the Study 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  $R^2$  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).

## **5.5 Conclusions**

This study successfully proves that TAM is fit and is able to predict the BI of GY to adopt TPs in Malaysia. Furthermore, this study also indicates the relationships between PU, IM, SI, PE and BI of GY to adopt TPs are all positive and significant. Although PEOU has a positive relationship with BI of GY to adopt TPs, the relationship is not significant. This study also successfully concludes that SI is the strongest determinant of BI of GY to adopt TPs among all the IVs.

## REFERENCES

- Ajila, S. A., & Wu, D. (2007). Empirical study of the effects of open source adoption on software development economics. *The Journal of Systems and Software*, 80, 1517-1529.
- Anandarajan, M., Zaman, M., Dai, Q., & Arinze, B. (2010). Generation Y adoption of instant messaging: An examination of the impact of social usefulness and media richness on use richness. *Professional Communication*, 53(2), 132-143.
- Apple. (2011). *iPhone*. Retrieved June 25, 2011, from Apple: <http://www.apple.com/iphone/features/camera.html>
- Bauer, H. H., Barnes, S. J., Reichardt, T., & Neumann, M. M. (2005). Driving consumer acceptance of mobile marketing: A theoretical framework and empirical study. *Journal of Electronic Commerce Research*, 6(3), 181-192.
- Baykal, A., & Circi, R. (2010). Item revision to improve construct validity: A study on released science items in Turkish PISA 2006. *Procedia Social and Behavioral Sciences*, 2, 1931-1935.
- Benamati, J., & Rajkumar, T. M. (2002). The application development outsource decision: An application of the Technology Acceptance Model. *Journal of Computer Information Systems*, 42(4), 35-44.
- Benbasat, I., & Barki, H. (2007). Quo vadis, TAM? *Journal of the Association for Information Systems*, 8(4), 211-218.
- Biljon, J. v., & Kotze, P. (2007). Modelling the factors that influence mobile phone adoption. *Proceedings of the 2007 annual research conference of the South African institute of computer scientists and information technologists on IT research in developing countries*, 152-161.
- Bowling, A., & Ebrahim, S. (2005). *Handbook of health research methods: Investigation, measurement and analysis*. New York: McGraw-Hill.
- Broadbridge, A. M., Maxwell, G. A., & Ogden, S. M. (2009). Selling retailing to Generation Y graduates: recruitment challenges and opportunities. *The International Review of Retail, Distribution and Consumer Research*, 19(4), 405-420.
- Carlsson, C., Walden, P., & Bouwman, H. (2006). Adoption of 3G + services in Finland. *International Journal of Mobile Communication*, 4(4), 369-385.
- Carter, L., & Belanger, F. (2004). The influence of perceived characteristics of innovating on e-Government adoption. *Electronic Journal of e-Government*, 2(1), 11-20.

- Chang, C. C., & Chin, Y. C. (2011). Predicting the usage intention of social network games: An intrinsic-extrinsic motivation theory perspective. *Annual Conference on Innovations in Business & Management*, 1-18.
- Chen, K., Chen, J. V., & Yen, D. C. (2011). Dimensions of self-efficacy in the study of smart phone acceptance. *Computer Standards & Interfaces*, 33, 422-431.
- Chen, Y., Okudan, G. E., & Riley, D. R. (2010). Sustainable performance criteria for construction method selection in concrete buildings. *Automation in Construction*, 19, 235-244.
- Cho, D. Y., Kwon, H. J., & Lee, H. Y. (2007). Analysis of trust in internet and mobile commerce adoption. *Proceedings of the 40th Hawaii International Conference on System Sciences*, 1-10.
- Choi, Y. K., & Totten, J. W. (2011). Self-construal's role in mobile TV acceptance: Extension of TAM across cultures. *Journal of Business Research*.
- Chong, A. Y., Darmawan, N., Ooi, K. B., & Lee, V. H. (2010). Determinants of 3G adoption in Malaysia: A structural analysis. *Journal of Computer Information Systems*, 51(2), 71-80.
- Chong, A. Y., Ooi, K. B., & Sohal, A. (2009). The relationship between supply chain factors and adoption of e-Collaboration tools: An empirical examination. *Int. J. Production Economics*, 122, 150-160.
- Choy, J. Y., Ng, C. S., & Ch'ng, H. K. (2011). Consumers' perceived quality, perceived value and perceived risk towards purchase decision on automobile. *American Journal of Economics and Business Administration*, 3, 47-57.
- Chuttur, M. (2009). Overview of the technology acceptance model: Origins, developments and future directions. *Sprouts: Working Papers on Information Systems*, 9.
- Conci, M., Pianesi, F., & Zancanaro, M. (2009). Useful, social and enjoyable: Mobile phone adoption by older people. *Lecture Notes in Computer Science*, 5726, 63-76.
- Considine, J., & Martin, R. (2005). Development, reliability and validity of an instrument measuring the attitudes and knowledge of Emergency Department staff regarding the Emergency Nurse Practitioner role. *Accident and Emergency Nursing*, 13, 36-43.
- Cramer, D. (1998). *Fundamental statistics for social research: Step-by-step calculations and computer techniques using SPSS for Windows*. London: Routhledge.

- Dacko, S. G. (2008). *The advanced dictionary of marketing: Putting theory to use*. New York: Oxford University Press.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
- Davis, F. D. (1993). User acceptance of information technology: System characteristics, user perceptions and behavioral impacts. *International Journal of Human-Computer Studies*, 38(3), 475-487.
- Davis, F. D., Bagozzi, R. P. and Warshaw, P. R. (1989): User acceptance of computer technology: a comparison of two theoretical models, *Management Science*, 35 (8), 982-1003.
- Djamasbia, S., Siegelb, M., & Tullis, T. (2010). Generation Y, web design, and eye tracking. *International Journal of Human-Computer Studies*, 68(5), 307-323.
- Einarsdóttir, S., & Rounds, J. (2009). Gender bias and construct validity in vocational interest measurement: Differential item functioning in the Strong Interest Inventory. *Journal of Vocational Behavior*, 74, 295-307.
- Evens, T., Schuurman, D., Marez, L. D., & Verleye, G. (2010). Forecasting broadband Internet adoption on trains in Belgium. *Telematics and Informatics*, 27, 10-20.
- Fatoki, O., & Odeyemi, A. (2010). The determinants of access to trade credit by new SMEs in South Africa. *African Journal of Business Management*, 4(13), 2763-2770.
- Faziharudean, T., & Tan, L. L. (2011). Consumers' behavioral intentions to use mobile data services in Malaysia. *African Journal of Business Management*, 5(5), 1811-1821.
- Field, A. (2000). *Discovering statistics using SPSS for Windows: Advanced techniques for the beginner*. London: SAGE Publications Ltd.
- Flint, D. J., Blocker, C. P., & Boutin, P. J. (2011). Customer value anticipation, customer satisfaction and loyalty: An empirical examination. *Industrial Marketing Management*, 40, 219-230.
- Fuente, A. d., Bing, N., Hoeschele, I., & Mendes, P. (2004). Discovery of meaningful associations in genomic data using partial correlation coefficients. *Bioinformatics*, 20, 3565-3574.



- Grady, K. L., Young, J. B., Pelegrin, D., Czerr, J., Higgins, R., Heroux, A., et al. (2007). Patterns and predictors of physical functional disability at 5 to 10 years after heart transplantation. *The Journal of Heart and Lung Transplantation, 26*, 1182-1191.
- Gravetter, F. J., & Wallnau, L. B. (2008). *Essentials of statistics for the behavioral sciences* (6th ed.). Belmont, CA: Cengage Learning.
- Greene, J. A., & Brown, S. C. (2009). The wisdom development scale: Further validity investigations. *International Journal of Aging and Human Development, 68*(4), 289-320.
- Hair, J., Black, W., Babin, B., Anderson, R., & Tatham, R. (2005). *Multivariate Data Analysis*. New Jersey: Prentice-Hall.
- Hakkila, J., & Mantyjarvi, J. (2005). Collaborative in Context-Aware Mobile Phone Applications. *Proceedings of the 38th Hawaii International Conference on System Sciences*, 33a.
- Hedeker, D. R., & Gibbons, R. D. (2006). *Longitudinal data analysis*. Hoboken, New Jersey: John Wiley and Sons Inc.
- Heijden, H. V. (2004). User Acceptance of Hedonic Information System. *MIS Quarterly, 28*(4), 695-704.
- Heijden, H. V., & Verhagen, T. (2004). Online store image: Conceptual foundations and empirical measurement. *Information & Management, 41*, 609-617.
- Hirsch, M. L. (2000). *Advanced Management Accounting*. London: Thomson Learning.
- Hoffman, D., Novak, D., & Thomas, P. (1996). Marketing in hypermedia computer-mediated environments: conceptual foundations. *Journal of Marketing, 60*, 50-68.
- Holah, M. (2009, November 19). *Self selected sampling*. Retrieved April 20, 2011, from PsychExchange.co.uk: <http://www.psychexchange.co.uk/glossary/self-selected-sampling-155/>
- Homburg, C., Koschate, N., & Hoyer, W. D. (2005). Do satisfied customers really pay more? A study of the relationship between customer satisfaction and willingness to pay. *Journal of Marketing, 69*, 84-96.
- Houser, R. (1998). *Counseling and educational research: Evaluation and application*. London: SAGE Publications.

- Hsu, C. L., & Lu, H. P. (2004). Why do people play on-line games? An extended TAM with social influences and flow experience. *Information & Management*, 41, 853–868.
- Hsu, C. L., Lu, H. P., & Hsu, H. H. (2007). Adoption of the mobile internet: An empirical study of multimedia message service (MMS). *Omega*, 35(6), 715-726.
- Hussein, R., Mohamed, N., Ahlan, A. R., Mahmud, M., & Aditiawarman, U. (2010). An integrated model on online tax adoption. *European, Mediterranean & Middle Eastern Conference on Information Systems*, 1-16.
- Jaramillo, L. C., Vasquez, L. J., Gallo, A., Duque, O. J., & Bell, V. (2010). Effects of recurrence on the cognitive performance of patients with bipolar I disorder: Implications for relapse prevention and treatment adherence. *Bipolar Disorders*, 12, 557-567.
- Jayasingh, S., & Eze, U. C. (2009). An empirical analysis of consumer behavioral intention toward mobile coupons in Malaysia. *International Journal of Business and Information*, 4(2), 221-241.
- Joseph, C. (2006). Negotiating discourses of gender, ethnicity and schooling: Ways of being Malay, Chinese and Indian schoolgirls in Malaysia. *Pedagogy, Culture and Society*, 14, 35-53.
- Jung, K., & Kau, A. (2004). Culture's influence on consumer behaviours: Differences among ethnic groups in a multiracial Asian country. *Advances in Consumer Research*, 31, 366-372.
- Karahana, E., Straub, D., & Chervancy, N. (1999). Information technology adoption across time: A cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS Quarterly*, 23(2), 183–213.
- Karim, N. H., & Noor, N. H. (2006). Evaluating the psychometric properties of Alleen and Meyer's organizational commitment scale: A cross cultural application among Malaysian academic librarians. *Malaysian Journal of Library & Information Science*, 11, 89-101.
- Karim, N. S., Alias, R. A., Mokhtar, S. A., & Rahim, N. Z. (2009). Mobile phone adoption and appropriation in Malaysia and the contribution of age and gender. *International Conference on Information and Multimedia Technology*, 485-490.
- Kim, K., Kim, G. M., & Eun, S. K. (2009). Measuring the compatibility factors in mobile entertainment service adoption. *Journal of Computer Information System*, 50(1), 141-148.

- Klugh, H. E. (1986). *Statistics: The essentials for research*. New Jersey London: Routledge.
- Knox, D., & Schacht, C. (2009). *Choices in relationships: An introduction to marriage and the family*. Belmont, CA: Thomson Learning.
- Kulviwat, S., Bruner II, G. C., & Al-Shuridah, O. (2009). The role of social influence on adoption of high tech innovations: The moderating effect of public/private consumption. *Journal of Business Research*, 62, 706–712.
- Kwon, O., Choi, K., & Kim, M. (2007). User acceptance of context-aware services: Self efficacy, user innovativeness and perceived sensitivity on contextual pressure. *Behavior & Information Technology*, 26(6), 482-498.
- Lai, H. M., & Chen, C. P. (2011). Factors influencing secondary school teachers' adoption of teaching blogs. *Computers & Education*, 56, 948-960.
- Lee, E. L. (2007). The chinese Malaysians' selfish mentality and behaviors: Rationalizing from the native perspectives. *Chinese Media Research*, 3(4), 91-119.
- Lee, M. C. (2009). Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit. *Electronic Commerce Research and Applications*, 8, 130-141.
- Lee, Y., Kozar, K. A., & Larsen, K. R. (2003). The technology acceptance model: Past, present, and future. *Communications of the Association for Information Systems*, 12(1), 752-780.
- Leung, P., Erich, S., & Kanenberg, H. (2004). A comparison of family functioning in gay/lesbian, heterosexual and special needs adoptions. *Children and Youth Services Review*, 27(9), 1031-1044.
- Leung, T. F., Wong, G. W. K., Ko, F. W. S., Lam, C. W. K., & Fok, T. F. (2005). Clinical and atopic parameters and airway inflammatory markers in childhood asthma: A factor analysis. *Thorax*, 60(10), 822-826.
- Li, D., Chau, P. Y., & Lou, H. (2005). Understanding individual adoption of instant messaging: An empirical investigation. *Journal of the Association for Information Systems*, 6(4), 102-129.
- Li, L. (2010). *A Critical Review of Technology Acceptance Literature*. Retrieved April 19, 2011, from Southwest Region of the Decision Sciences Institute: [http://www.swdsi.org/swdsi2010/SW2010\\_Preceedings/papers/PA104.pdf](http://www.swdsi.org/swdsi2010/SW2010_Preceedings/papers/PA104.pdf)
- Lighter, D. E. (2011). *Advanced performance improvement in health care: Principles and methods*. MA: Jones & Bartlett Learning.

- Lipsman, A. (2009). *Touchscreen Mobile Phone Adoption Grows at Blistering Pace in U.S. During Past Year*. Retrieved March 2, 2011, from comScore, Inc.: [http://comscore.org/Press\\_Events/Press\\_Releases/2009/11/Touchscreen\\_Mobile\\_Phone\\_Adoption\\_Grows\\_at\\_Blistering\\_Pace\\_in\\_U.S.\\_During\\_Past\\_Year](http://comscore.org/Press_Events/Press_Releases/2009/11/Touchscreen_Mobile_Phone_Adoption_Grows_at_Blistering_Pace_in_U.S._During_Past_Year)
- Lou, H., Scamell, R., & Shah, J. (2006). Use of a groupware product: A test of three theoretical perspectives. *Journal of Computer Information Systems*, 46(4), 35-45.
- Lu, J., Yao, J. E., & Yu, C. S. (2005). Personal innovativeness, social influences and adoption of wireless Internet services via mobile technology. *Journal of Strategic Information Systems*, 14(3), 245-268.
- Lu, W., & Zhang, M. (2008). The adoption and use of mobile phone in rural China: A case study of Hubei, China. *Telematics and Informatics*, 25(3), 169-186.
- Lu, Y., Deng, Z., & Wang, B. (2010). Exploring factors affecting Chinese consumers' usage of short message service for personal communication. *Information Systems Journal*, 20(2), 183-208.
- Luarn, P., & Lin, H. H. (2005). Toward an understanding of the behavioral intention to use mobile banking. *Computers in Human Behavior*, 21, 873-889.
- Mahmod, R., Dahlan, N., Ramayah, T., Karia, N., & Asaari, M. H. (2005). Attitudinal belief on adoption of E-MBA program in Malaysia. *Turkish Online Journal of Distance Education*, 6(2), 115-124.
- Martin, J. (2010, October 5). *New mobile phones born with the a status symbol*. Retrieved March 24, 2011, from EzineMark.com: <http://technology.ezinemark.com/new-mobile-phones-born-with-the-a-status-symbol-16b1c5a08b7.html>
- Matignon, R. (2005). *Neural Network Modeling Using Sas Enterprise Miner*. Bloomington, IN: AuthorHouse.
- McCrindle, M. (2005, September 29). *Understanding generation Y*. Retrieved June 26, 2011, from Learning to Learn: <http://www.learningtolearn.sa.edu.au/Colleagues/files/links/UnderstandingGenY.pdf>
- Meng, X., Deal, P., Liu, L., Griffin, C., & Barnett, W. (2010). 3g mobile phone adoption and continued use: A pilot study. *Issues in Information Systems*, 11(1), 247-255.
- Mezick, E. M. (2007). Return on investment: Libraries and student. *The Journal of Academic Librarianship*, 33(5), 561-566.

- Miles, J., & Shevlin, M. (2001). *Applying regression & correlation: A guide for students and researchers*. London: Sage Publications.
- Molla, A., & Licker, P. S. (2005). eCommerce adoption in developing countries: A model and instrument. *Information & Management*, 42, 877-899.
- Moon, J. W., & Kim, Y. G. (2001). Extending the TAM for a World-Wide-Web context. *Information & Management*, 38, 217-230.
- Newton, R. R., & Rudestam, K. E. (1999). *Your statistical consultant: Answers to your data analysis questions*. Thousand Oaks, CA: SAGE Publications Ltd.
- Noble, S. M., Haytko, D. L., & Phillips, J. (2009). What drives college-age Generation Y consumers? *Journal of Business Research*, 62, 617-628.
- Nusair, K., Parsa, H., & Cobanoglu, C. (2011). Building a model of commitment for Generation Y: An empirical study on e-travel retailers. *Tourism Management*, 32(4), 833-843.
- Nysveen, H., Pedersen, P., & Thorbornsen, H. (2005). Intention to use mobile services: Antecedents and cross-service comparison. *Journal of the Academy of Marketing Science*, 33(3), 330-346.
- O'Shaughnessy, J. (1995). *Competitive marketing: A strategic approach* (3rd ed.). New York: London: Routledge.
- Okazaki, S. (2008). Exploring experiential value in online mobile gaming adoption. *Cyber Psychology & Behaviour*, 11(5), 619-622.
- Omoush, K. S., & Shaqrah, A. A. (2010). An empirical study of household internet continuance adoption among Jordanian users. *International Journal of Computer Science and Network Security*, 10(1), 32-44.
- Ott, R., & Longnecker, M. (2011). *An Introduction to Statistical Methods and Data Analysis*. Boston: Thomson Learning Inc.
- Ozdemir, R. S., Louis, K. O., & Topbas, S. (2011). Public attitudes toward stuttering in Turkey: Probability versus convenience sampling. *Journal of Fluency Disorders*, 1-6.
- Pagani, M. (2004). Determinants of adoption of third generation mobile multimedia services. *Journal of Interactive Marketing*, 18(3), 46-59.
- Pai, F. Y., & Huang, K. I. (2011). Applying the Technology Acceptance Model to the introduction of healthcare information systems. *Technological Forecasting & Social Change*, 78, 650-660.

- Parinet, B., Lhot, A., & Legub, B. (2004). Principal component analysis: An appropriate tool for water quality evaluation and management-application to a tropical lake system. *Ecological Modelling*(178), 295–311.
- Park, Y. S., & Han, S. H. (2010). Touch key design for one-handed thumb interaction with a mobile phone: Effects of touch key size and touch key location. *International Journal of Industrial Ergonomics*, 40(1), 68-76.
- Pavlou, P. A. (2003). Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model. *International Journal of Electronic Commerce*, 7(3), 101-134.
- Pettey, C., & Tudor, B. (2010). *Gartner Says Touchscreen Mobile Device Sales Will Grow 97 Percent in 2010*. Retrieved March 2, 2011, from Gartner: <http://www.gartner.com/it/page.jsp?id=1313415>
- PricewaterhouseCoopers. (2010). *The New Consumer Behavior Paradigm: Permanent or Fleeting?* Retrieved April 17, 2011, from PwC: <http://www.pwc.com/us/en/retail-consumer/assets/the-new-consumer-behavior-paradigm.pdf>
- Ramayah, T., & Ignatius, J. (2005). Impact of perceived usefulness, perceived ease of use and perceived enjoyment on intention to shop online. *Journal of Systems Management*, 3(3), 36-51.
- Ramayah, T., & Jantan, M. (2004). Technology acceptance: An individual perspective current and future research in malaysia. *Review of Business Research*, 2(1), 103-111.
- Rao, S., & Troshani, I. (2007). A conceptual framework and propositions for the acceptance of mobile services. *Journal of Theoretical and Applied Electronic Commerce Research*, 2(2), 61-73.
- Raston, N. A., Awang, Z., & Hamzah, N. H. (2010). The effects of Information Communication Technology (ICT) policy on security compliance among department of Irrigation and Drainage (DID) staff in Kelantan. *Journal of Statistical Modeling and Analytics*, 1, 28-44.
- Reilly, T. P. (2002). *Value-added selling: How to sell more profitably, confidently, and professionally by competing on value, not price* (2nd ed.). New York: McGraw-Hill.
- Rogers, E. M. (1995). *Diffusion of innovations*. New York: The Free Press.
- Rouibah, K., & Abbas, H. (2006). A modified technology acceptance model for camera mobile phone adoption: Development and validation. *17th Australasian Conference on Information Systems*, 1-11.

- Salkind, N. J. (2010). *Encyclopedia of Research Design*. Thousand Oaks, CA: SAGE Publications.
- Sani, M., Yusof, N., Kasim, A., & Omar, R. (2009). Malaysia in transition: A comparative analysis of Asian values, Islam Hadhari and 1 Malaysia. *Journal of Politics and Law*, 2(3), 110-118.
- Sapp, M. (2006). *Basic psychological measurement, research designs, and statistics without math*. Springfield, IL: Thomas Publisher.
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (5th ed.). Harlow, UK: Pearson Education.
- Schlitzkus, L. L., Schenarts, K. D., & Schenarts, P. J. (2010). Is your residency program ready for Generation Y? *Journal of Surgical Education*, 67(2), 108-111.
- Selamat, Z., & Jaffar, N. (2011). Information technology acceptance: From perspective of Malaysian bankers. *International Journal of Business and Management*, 6(1), 207-217.
- Selamat, Z., Jaffar, N., & Boon, O. H. (2009). Technology acceptance in Malaysian banking industry. *European Journal of Economics, Finance and Administrative Sciences*, 17, 143-155.
- Shin, D. H. (2007). User acceptance of mobile Internet: Implication for convergence technologies. *Interacting with Computers*, 19(4), 472-483.
- Shin, D. H. (2009). An empirical investigation of a modified technology acceptance model of IPTV. *Behaviour & Information Technology*, 28(4), 361-372.
- Simonson, I., & Nowlis, S. M. (2000). The role of explanations and need for uniqueness in consumer decision making: Unconventional choices based on reasons. *Journal of Consumer Research*, 49-68.
- Singh, J., & Goyal, B. (2009). Mobile handset buying behavior of different age and gender groups. *International journal of business and management*, 4(5), 179-187.
- Suki, N. M. (2011). Subscribers' intention towards using 3G mobile services. *Journal Of Economics and Behavioral Studies*, 2(2), 67-75.
- Sun, H., & Zhang, P. (2006). The role of moderating factors in user technology acceptance. *International Journal of Human-Computer Studies*, 64, 53-78.

- Sung, J., & Yun, Y. (2010). Toward a more robust usability concept with perceived enjoyment in the context of mobile multimedia service. *International Journal of Human Computer Interaction*, 1(2), 12-32.
- Tan, F. B., & Chou, J. P. (2008). The relationship between mobile service quality, perceived technology compatibility, and user perceived playfulness in the context of mobile information and entertainment services. *Journal of Human-Computer Interaction*, 24(7), 649-671.
- Tan, M. (2000). Factors influencing the adoption of internet banking. *Journal of the Association for Information Systems*, 1, 1-42.
- Tarling, R. (2008). *Statistical modelling for social researchers: Principles and practice*. London: Routledge.
- Teo, T., & Noyes, J. (2011). An assessment of the influence of perceived enjoyment and attitude on the intention to use technology among pre-service teachers: A structural equation modelling approach. *Computers & Education*, 57(2), 1645-1653.
- Teo, T., & Pok, S. H. (2003). Adoption of WAP-enabled mobile phones among internet users. *Omega*, 31, 483-498.
- Trochim, W. M. (2006, October 20). *Time in Research*. Retrieved March 28, 2011, from Research Methods Knowledge Base: <http://www.socialresearchmethods.net/kb/timedim.php>
- Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research*, 11(4), 324-365.
- Venkatesh, V., & Brown, S. (2001). A longitudinal investigation of personal computers in homes: Adoption determinants and emerging challenges. *MIS Quarterly*, 25(1), 71-102.
- Wang, C. Y., Chou, S. C., & Chang, H.C. (2010). Exploring an individual's intention to use blogs: The roles of social, motivational and individual factors. *Pacific Asia Conference on Information Systems*, 1656-1663.
- Wei, T. T., Marthandan, G., Chong, A. Y. L., Ooi, K. B., & Arumugam, S. (2009). What drives Malaysian m-commerce adoption? An empirical analysis. *Industrial Management & Data Systems*, 109(3), 370-388.
- Weil, R. L., Frank, P. B., Hughes, C. W., & Wagner, M. J. (2007). *Litigation services handbook: The role of the financial expert* (4th ed.). Hoboken, New Jersey: John Wiley and Sons Inc.



- Williams, K. C., Page, R. A., Petrosky, A. R., & Hernandez, E. H. (2010). Multi-generational marketing: Descriptions, characteristics, lifestyles, and attitudes. *Journal of Applied Business and Economics*, 11, 21-36.
- Wilson, J. S., & Blumenthal, I. (2008). *Managing brand you: Seven steps to creating your most successful self*. New York: AMACOM.
- Wong, C. C., & Hiew, P. L. (2005). Diffusion of mobile entertainment in Malaysia: Drivers and barriers. *World Academy of Science, Engineering and Technology*, 11, 135-138.
- Yaghoubi, N. M., & Bahmani, E. (2010). Factors affecting the adoption of online banking: An intergration of technology acceptance model and theory of planned behavior. *Pakistan Journal of Social Sciences*, 7(3), 231-236.
- Yan, A. W., Khalil, M. N., Emad, A. S., & Sutanonpaiboon, J. (2009). Factors that affect mobile telephone users to use mobile payment solution. *International Journal of Economics and Management*, 3(1), 37-49.
- Yang, K. C. (2005). Exploring factors affecting the adoption of mobile commerce in Singapore. *Journal of Telematics and Informatics*, 22(3), 257-277.
- Yoon, C. (2009). The effects of national culture values on consumer acceptance of e-commerce: Online shoppers in China. *Information & Management*, 46, 294-301.
- Yousafzai, S. Y., Foxall, G. R., & Pallister, J. G. (2007). Technology acceptance: A meta-analysis of the TAM: Part 1. *Journal of Modelling in Management*, 2(3), 251-280.
- Yu, J., Ha, I., Choi, M., & Rho, J. (2005). Extending the TAM for a t-commerce. *Information & Management*, 42, 965-976.
- Yusoff, Y. M., Ramayah, T., & Ibrahim, H. (2010). E-HRM: A proposed model based on technology acceptance model. *African Journal of Business Management*, 4(13), 3039-3045.
- Zeng, S., Meng, X., Yin, H., Tam, C., & Sun, L. (2010). Impact of cleaner production on business performance. *Journal of Cleaner Production*, 18, 975-983.
- Zhu, J., & He, Z. (2002). Perceived characteristics, perceived needs, and perceived popularity: Adoption and use of the Internet in China. *Communication Research*, 29(4), 466-495.

Appendix 2.1: Summary of Past Empirical Studies on PU – BI

<i>Study</i>	<i>Country</i>	<i>Data</i>	<i>Inferential Statistics</i>	<i>Major Findings</i>
Moon and Kim (2001).	South Korea	Questionnaire survey of 208 graduate students from school of management.	-multiple linear regression -Pearson correlation analysis	PU has a positive and significant effect on BI.
Li, Chau and Lou (2005).	USA	Questionnaire survey of 400 students drawn in two mid-western public universities.	-chi-square test	PU is positive and significant in explaining an individual's BI.
Conci, Pianesi and Zancanaro (2009).	Italy	Questionnaire survey of 2970 elders who joined the activities of Third Age University of Trento.	-t-test -partial least squares	PU is positively and significantly related to BI to use.
Jayasingh and Eze (2009).	Malaysia	Questionnaire survey of 1000 mobile phone users in Selangor, Kuala Lumpur, Johor, and Sarawak.	-structural equation modelling	PU has a significant and positive effect on BI.
Yaghoubi and Bahmani (2010).	Iran	Questionnaire survey of 500 online banking users in Isfahan province.	-structural equation modelling	PU is positively and significantly affecting BI.
Faziharudean and Tan (2011).	Malaysia	Questionnaire survey of 440 mobile phone subscribers in Klang Valley. Convenience sampling was the sampling method.	-multiple regression analysis	PU has a significant and positive effect on BI.

Source: Developed for the research

Appendix 2.2: Summary of Past Empirical Studies on PEOU – BI

<i>Study</i>	<i>Country</i>	<i>Data</i>	<i>Inferential Statistics</i>	<i>Major Findings</i>
Ramayah and Ignatius (2005).	Malaysia	Questionnaire survey (by convenient sampling) of 150 staff of public institution of higher learning.	-multiple regression analysis -Pearson correlation analysis	PEOU is imperative in predicting the BI. PEOU is positively correlated to BI.
Cho, Kwon and Lee (2007)	Korea	Questionnaire survey of 513 undergraduate students who have experience in using internet and mobile commerce to assess the ringback tone service vendors.	-structural equation modelling	PEOU is positively correlated to BI; however PEOU is not significant in affecting the BI.
Yan, Khalil, Emad and Sutanonpaiboon (2009).	Malaysia	Stratified sampling survey with paper-based questionnaire. Target respondents were 240 marketing students in one public university in Malaysia.	-factor analysis (principle components with Varimax rotation) -multiple regression analysis	PEOU is found insignificant in influencing the BI, but there is a positive relationship among them.
Sung and Yun (2010).	America	Web-based survey of 148 undergraduate students in a large mid-western university.	-partial least squares -Pearson correlation analysis	Positive relationship between PEOU and BI.
Suki (2011).	Malaysia	Questionnaire survey of 150 subscribers of 3G mobile services.	-multiple regression analysis -Pearson correlation analysis	Positive and significant relationship between PEOU and BI.

Source: Developed for the research

## Appendix 2.3: Summary of Past Empirical Studies on IM – BI

<i>Study</i>	<i>Country</i>	<i>Data</i>	<i>Inferential Statistics</i>	<i>Major Findings</i>
Carter and Belanger (2004).	USA	Questionnaire survey of 140 undergraduate students at a south eastern research university. 136 were complete and used in the analysis.	-factor analysis (principle components with Promax rotation) -multiple linear regression	Positive relationship between IM and BI. IM is found to be significant in predicting BI.
Mahmod, Dahlan, Ramayah, Karia and Asaari (2005).	Malaysia	Self-administrated questionnaire survey of 200 individuals who possessing as a bachelor degree students or bachelor degree holder from various background of study. Sampling method used was purposive sampling.	-Pearson correlation analysis -multiple regression analysis	Significant relationship between IM and BI. IM is positive correlated with BI.
Hsu, Lu and Hsu (2007).	Taiwan	Internet mediated questionnaire survey, by putting the questionnaire on over 100 heavily trafficked online message boards for two months. 207 usable responses from potential MMS users and MMS adopted users.	-one-way analysis of variance (ANOVA) -multiple linear regression	IM is significantly and positively influencing BI. In general, young users easily accept new technology.
Hussein, Mohamed, Mahmud, Ahlan and Aditiawarman (2010).	Malaysia	Questionnaire survey of 500 lecturers and administrative staffs from five different public universities. A stratified sampling technique was employed. Only 411 usable responses.	-Pearson correlation analysis -multiple regression analysis	IM is found to have positive relationship with BI. IM also has significant relationship with BI.
Omoush and Shaqrah (2010).	Hashemite Kingdom of Jordan	Questionnaire survey was distributed to people who have adopted and currently using the internet in their homes. Target respondents are randomly chosen from universities teachers, household internet adopters, those living in the local vicinity, and friends' networks.	-average variance extracted (AVE) -partial least squares	Significant relationship between IM and BI. IM has direct positive effect on BI.

Source: Developed for the research

## Appendix 2.4: Summary of Past Empirical Studies on SI – BI

<i>Study</i>	<i>Country</i>	<i>Data</i>	<i>Inferential Statistics</i>	<i>Major Findings</i>
Hsu and Lu (2004).	Taiwan	Internet mediated questionnaire survey, by putting the questionnaire on over 50 heavily trafficked online message boards on popular game-related web sites. 233 usable responses from online game users.	-structural equation modelling -multivariate analysis of variance (MANOVA) analysis	SI has a direct effect on the users' BI.
Shin (2007).	Korea	Telephone interviews of 986 Korean's adult between age of 18-74 were conducted from a computerized random digit dialing procedure.	-simple linear correlation -structural equation modelling	SI has positive association and significant power in explaining BI.
Kulviwat, Bruner II and Al-Shuridah (2009).	USA	Questionnaire surveys of 260 students. Responses were collected after a presentation and task-involvement pertaining to a new technological consumer product from the researchers.	-structural equation modelling -chi-square difference test	SI is positively related to the BI.
Kim, Kim and Eun (2009).	South Korea	A total of 269 questionnaires surveys of undergraduate and graduate college students as well as working adults from various positions and industries were used for this study.	-structural equation model	SI has a positive influence on BI and SI is significant in explaining the BI.
Wei, Marthandan, Ooi and Arumugam (2009)	Malaysia	Questionnaires surveys were distributed to mobile device users through e-mail and mobile phone service provider shops located in various shopping malls.	-Pearson correlation analysis -multiple regression analysis	Social influence has a positive and significant relationship on the BI.

Source: Developed for the research

## Appendix 2.5: Summary of Past Empirical Studies on PE – BI

<i>Study</i>	<i>Country</i>	<i>Data</i>	<i>Inferential Statistics</i>	<i>Major Findings</i>
Heijden (2004).	Netherland	Internet questionnaire survey of 1144 users of a Dutch movie website.	-structural equation modelling	PE is a stronger determinant of BI than PU; and PE is significantly affecting the BI.
Li, Chau and Lou (2005).	China & USA	Questionnaire survey of 273 undergraduates in the US and 341 graduate students in China.	-structural equation modelling -confirmatory factor analysis	PE is positively associated with BI in both China and USA. PE is also significant in explaining the BI.
Selamat, Jaffar and Boon (2009).	Malaysia	Questionnaire survey of 200 bankers (randomly selected) located in the Klang Valley in Malaysia.	-factor analysis (principle components with Varimax rotation)	PE significantly affects the BI.
Lu, Deng and Wang (2010).	China	Questionnaire survey of 263 mobile phone users in Wuhan and Zhengzhou, China.	-ANOVA -structural equation modelling	PE has a positive effect on BI among China users and the relationship has been proved as significant.
Wang, Chou and Chang (2010).	Taiwan	Questionnaire survey of 283 students from the business school at a university of science and technology in Taiwan and range in age from 18-45.	-structural equation modelling	PE has positive and significant impact on an individual's BI.
Teo and Noyes (2011).	Singapore	Online questionnaire survey of voluntary pre-service teachers, undergraduates and postgraduates.	-structural equation modelling -confirmatory factor analysis	PE has a significant influence on BI.
Chang and Chin (2011).	Taiwan	Questionnaire survey of 498 undergraduate and graduate students at a university in eastern Taiwan volunteered to participate in the study. All participants signed an informed consent form at the beginning of the survey.	-multiple regression analysis -multivariate analysis of variance (MANOVA) analysis	Higher level of PE leads to higher levels of BI.

Source: Developed for the research

## Appendix 3.1: Definition for Each Variable

Constructs	Definition	Sources
Perceived Usefulness	Practical benefits or relative advantages for an individual when using TP.	(Meng, Deal, Liu, Griffin & Barnett, 2010)
	The degree of which a person believes that using a TP would enhance his or her job performance.	(Sung <i>et al.</i> , 2010)
Perceived Ease of Use	The degree to which an individual believes that using TP would be free of physical and mental effort.	(Wei <i>et al.</i> , 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 <i>et al.</i> , 2004)
Social Influence	An individual's belief about whether significant others think that one should use TP.	(Wei <i>et al.</i> , 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 <i>et al.</i> , 2010)
	Perception of the fun, enjoyment, and pleasure inherent in using TP.	(Li <i>et al.</i> , 2005)
Behaviour Intention	The strength of one's willingness to use a TP.	(Moon <i>et al.</i> , 2001)

Source: Developed for the research

## Appendix 3.2: Sources of Variables

Variables	Items	Description	Sources
Perceived Usefulness  IV  4 items	PU1	Using touchscreen mobile phone brings me many benefits.	(Meng <i>et al.</i> , 2010)
	PU2	Using touchscreen mobile phone improves the performance of my tasks.	
	PU3	Using touchscreen mobile phone enables me to accomplish tasks more quickly.	
	PU4	Using touchscreen mobile phone increases my task productivity.	
Perceived Ease of Use  IV  3 items	PEOU1	It is easy to learn how to use touchscreen phone.	(Wei <i>et al.</i> , 2009)
	PEOU2	Touchscreen phone is understandable and clear.	
	PEOU3	Touchscreen phone is easy-to-use.	
Image  IV  5 items	IM1	People who use a touchscreen phone have more prestige than those who do not.	(Carter <i>et al.</i> , 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 <i>et al.</i> , 2003)
	IM5	Using touchscreen mobile phone improves my image.	



Social Influence	SI1	Friend's suggestion and recommendation will affect my decision to use touchscreen mobile phone.	(Wei <i>et al.</i> , 2009)
IV 5 items	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.	
Perceived Enjoyment	PE1	Using touchscreen mobile phone is entertaining.	(Sung <i>et al.</i> , 2010)
IV 4 items	PE2	Using touchscreen mobile phone is exciting.	
	PE3	Using touchscreen mobile phone provides me with a lot of enjoyment.	(Li <i>et al.</i> , 2005)
	PE4	I have fun in using touchscreen mobile phone.	
Behavioural Intentions	BI1	I believe my interest towards touchscreen mobile phone will increase in the future.	(Wei <i>et al.</i> , 2009)
DV 3 items	BI2	I believe I will use touchscreen mobile phone in the future.	
	BI3	I will strongly recommend others to use touchscreen mobile phone.	(Moon <i>et al.</i> , 2001)

Source: Developed for the research

Appendix 3.3: Questionnaire



**UNIVERSITI TUNKU ABDUL RAHMAN**  
**Faculty of Business and Finance**

**BACHELOR OF COMMERCE (HONS) ACCOUNTING**  
**FINAL YEAR PROJECT**

**TITLE:**

**Factors Affecting the Adoption of Touchscreen Mobile Phones: An Empirical Study among Generation Y**

**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 find out the factors that are affecting the adoption of touchscreen mobile phones in Peninsular Malaysia.

Thank you for your participation.

**Instructions:**

- 1) There are **TWO** (2) sections in this questionnaire. Please answer ALL questions in ALL sections.
- 2) Completion of this form will take you approximately 3 to 5 minutes.
- 3) Please feel free to share your comment in the space provided. The contents of this questionnaire will be kept **strictly confidential**.

**Section A: Demographic Profile**

**Please place a tick “√” or fill in the blank for each of the following:**

1. Gender:
  - Male
  - Female
  
2. Age:
  - Below 17 years old
  - 17-22 years old
  - 23-28 years old
  - 29-34 years old
  - Above 34 years old
  
3. Do you have experience in using touchscreen mobile phones?
  - Yes
  - No
  
4. Highest education completed:
  - Below SPM
  - SPM/ O-Level
  - STPM/ Foundation/ UEC/ A-Level
  - Diploma/ Advance Diploma
  - Bachelor Degree
  - Master Degree
  - PhD
  - Others : \_\_\_\_\_
  
5. Occupation
  - Student
  - Self-employed
  - Employed
  - Unemployed
  - Housewife
  - Others : \_\_\_\_\_
  
6. Marital Status
  - Single
  - Married
  - Divorced
  - Widowed

**Section B:**

Please circle your answer to each statement using 5 Likert scale [(1) = strongly disagree; (2) = disagree; (3) = neutral; (4) = agree and (5) = strongly agree]

**Perceived Usefulness (PU)**

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
PU1	Using touchscreen mobile phone brings me many benefits.	1	2	3	4	5
PU2	Using touchscreen mobile phone improves the performance of my tasks.	1	2	3	4	5
PU3	Using touchscreen mobile phone enables me to accomplish tasks more quickly.	1	2	3	4	5
PU4	Using touchscreen mobile phone increases my task productivity.	1	2	3	4	5

**Perceived Ease of Use (PEOU)**

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
PEOU1	It is easy to learn how to use touchscreen phone.	1	2	3	4	5
PEOU2	Touchscreen phone is understandable and clear.	1	2	3	4	5
PEOU3	Touchscreen phone is easy-to-use.	1	2	3	4	5

**Image (IM)**

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
IM1	People who use a touchscreen phone have more prestige than those who do not.	1	2	3	4	5
IM2	People who use a touchscreen phone have a high profile.	1	2	3	4	5
IM3	Having a touchscreen phone enhance a person's social status.	1	2	3	4	5
IM4	People who use touchscreen mobile phone are trendy.	1	2	3	4	5
IM5	Using touchscreen mobile phone improves my image.	1	2	3	4	5

**Social Influence (SI)**

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
SI1	Friend's suggestion and recommendation will affect my decision to use touchscreen mobile phone.	1	2	3	4	5
SI2	Family members/relatives have influence on my decision to use touchscreen mobile phone.	1	2	3	4	5
SI3	I will use touchscreen mobile phone if my colleagues/friends/relatives use it.	1	2	3	4	5
SI4	Mass media (e.g. TV, newspaper, articles, radio) will influence me to use touchscreen mobile phone.	1	2	3	4	5
SI5	I will use touchscreen mobile phone if it is widely used by people in my community.	1	2	3	4	5

**Perceived Enjoyment (PE)**

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
PE1	Using touchscreen mobile phone is entertaining.	1	2	3	4	5
PE2	Using touchscreen mobile phone is exciting.	1	2	3	4	5
PE3	Using touchscreen mobile phone provides me with a lot of enjoyment.	1	2	3	4	5
PE4	I have fun in using touchscreen mobile phone.	1	2	3	4	5

**Behavioural Intentions (BI)**

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
BI1	I believe my interest towards touchscreen mobile phone will increase in the future.	1	2	3	4	5
BI2	I believe I will use touchscreen mobile phone in the future.	1	2	3	4	5
BI3	I will strongly recommend others to use touchscreen mobile phone.	1	2	3	4	5

*Thank you for your time, opinion and comments.*

*~ The End ~*

Source: Developed for the research

Appendix 3.4: Permission Letter to Conduct Survey

---

Appendix 4.1: 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

**Appendix 4.2: EFA Results**

Variables	Items	Mean <sup>b</sup>	Std. Deviation	Factor loading <sup>a</sup>	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				

Notes: Extraction Method: Principal Component Analysis (n=226)

Rotation Method: Varimax with Kaiser Normalization

a. Rotation converged in 6 iterations

b. Scale ranging from Strongly Disagree (1) to Strongly Agree (5)

Source: Developed for the research



## Appendix 4.3: Skewness Measurement of All Items

Variables	Items	N	Skewness	Std. Error of Skewness
PU	PU1	226	-0.084	0.162
	PU2	226	-0.092	0.162
	PU3	226	0.030	0.162
	PU4	226	0.023	0.162
PEOU	PEOU1	226	-0.770	0.162
	PEOU2	226	-0.401	0.162
	PEOU3	226	-0.578	0.162
IM	IM1	226	0.058	0.162
	IM2	226	0.196	0.162
	IM3	226	0.012	0.162
	IM4	226	-0.309	0.162
	IM5	226	-0.055	0.162
SI	SI1	226	-0.485	0.162
	SI2	226	-0.418	0.162
	SI3	226	-0.105	0.162
	SI4	226	-0.356	0.162
	SI5	226	-0.373	0.162
PE	PE1	226	-0.574	0.162
	PE2	226	-0.151	0.162
	PE3	226	-0.512	0.162
	PE4	226	-0.454	0.162
BI	BI1	226	-0.449	0.162
	BI2	226	-0.407	0.162
	BI3	226	0.110	0.162

Source: Developed for the research

Appendix 4.4: Rotated Component Matrix<sup>a</sup>

	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.

Source: Developed for the research