UNIVERSITI PUTRA MALAYSIA

RELATIONSHIP BETWEEN ACCEPTANCE OF SMARTPHONES AND ITS INFLUENCE ON USERS' BEHAVIOR AMONG UNIVERSITY'S STUDENTS

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FBMK 2016 83

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By

SOO POH LEE

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Master of Science

October 2016

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Chairman : **Mohd Nizam Bin Osman, PhD**
Faculty : **Modern Languages and Communication**

Smartphones have been the key drivers in shaping the consumer technology in the world of how human communicate, consume information, seeking leisure and entertainment and managing daily lives routine. It has become a perceived necessity in people's daily lives nowadays and played an important role in many aspects of human daily activities that include home activities, personal, education, social networking and many others. However, spending too much time and excessive use on smartphone introduced some notable drawbacks. It becomes distractors and impacting users to be out of focus in delivering daily core activities.

The main objective of this study is to examine the relationship between acceptance of smartphone towards it influence associated with smartphone stress, dependency and addiction on users' behavior. As for the research methodology, the quantitative research method was employed to quantify the data and provide conclusive evidence. This was conducted through a set of questionnaires distributed by hand to 405 undergraduate students from both public and private higher education institutions in Selangor. Technology Acceptance Model (TAM) proposed by Davis (1989) was used as the theoretical framework for this study in order to determine the key determinants of smartphone acceptance while Pearson Correlation Analysis was used to determine the extent of associations between the independent variables and dependent variables.

The overall results from this study evident that Perceived Usefulness (PU) and Perceived Ease of Use (PEU) significantly influence undergraduate students' behavior on smartphone. The more useful and ease of use a technology is, the more it will accept by undergraduate students. This implies that PU and PEU influence the user's behavior as well as associate the stress, dependency and addiction of

smartphone usage. However, it was observed that the relationships on users' behavior were weak based on Guilford's Rule of Thumb. The implications of these findings warrant further future in-depth studies.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

HUBUNGAN DI ANTARA PENERIMAAN TELEFON PINTAR DAN PENGARUHNYA TERHADAP TINGKAH-LAKU PENGGUNA DI KALANGAN MAHASISWA MALAYSIA

Oleh

SOO POH LEE

Oktober 2016

Pengerusi : **Mohd Nizam Bin Osman, PhD**
Fakulti : **Bahasa Moden dan Komunikasi**

Telefon pintar telah menjadi pemacu utama dalam merubah dan membentuk teknologi pengguna dari sudut komunikasi, pengunaan maklumat, medium hiburan serta pengurusan rutin kehidupan seharian. Telefon pintar juga telah kini menjadi satu keperluan kesemestian di dalam kehidupan seharian pada masa kini yang memainkan peranan penting dalam pelbagai aspek aktiviti harian yang merangkumi aktiviti dirumah kediaman, peribadi, pendidikan, rangkaian sosial dan lain-lain lagi. Walau bagaimanapun, penggunaan yang berlebihan pada telefon pintar mengakibatkan beberapa kelemahan yang ketara. Ianya menjadi satu penghalang yang boleh mengakibatkan pengguna tidak dapat memberi fokus dalam menyempurnakan aktiviti-aktiviti utama seharian.

Objektif utama kajian ini adalah untuk mengkaji hubungan antara penerimaan telefon pintar dan kesan ke atas tingkah laku pengguna yang berkaitan dengan tekanan emosi akibat telefon pintar, kebergantungan dan ketagihan penggunaannya. Bagi metodologi tinjauan, kaedah penyelidikan kuantitatif telah digunakan untuk mengukur data dan menyediakan bukti-bukti kukuh. Ianya dijalankan melalui satu set soal selidik yang diedarkan kepada 405 pelajar ijazah dari kedua-dua institusi pengajian tinggi awam dan swasta di Selangor. "Technology Acceptance Model" (TAM) yang dicadangkan oleh Davis (1989) telah digunakan sebagai asas teori kajian ini untuk menentukan penentu utama penggunaan telefon pintar dan penerimaan di kalangan pelajar sarjana muda. Analisis Korelasi Pearson digunakan untuk menentukan sejauh mana perkaitan antara pembolehubah bebas dan pembolehubah bersandar.

Pada keseluruhannya, kajian ini membuktikan bahawa Persepsi Kebergunaan dan Persepsi Kemudahan Penggunaan pada telefon pintar adalah ketara dalam

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mempengaruhi tingkah laku pelajar ijazah. Apabila sesuatu teknologi menonjolkan kelebihan dan kemudahan dalam pengunaannya maka ia akan meyakinkan lagi penerimaan oleh pengguna. Ini menunjukkan bahawa Persepsi Kebergunaan dan Persepsi Kemudahan Kebergunaan mempengaruhi tingkah laku pengguna dari segi tekanan emosi, kebergantungan dan ketagihan penggunaan telefon pintar. Walau bagaimanapun, jelas diperhatikan bahawa hubungan kedua-dua Persepsi Kebergunaan dan Persepsi Kemudahan Kebergunaan terhadap pengaruh telefon pintar ke atas tingkah laku pengguna lemah berdasarkan "Guilford's Rule of Thumb". Implikasi daripada kajian ini dilihat dapat menyakinkan lagi kajian yang lebih mendalam perlu dilaksanakan dimasa hadapan.

AKNOWLEDGEMENTS

First and foremost, I would like to express my sincere gratitude to my supervisor Dr. Mohd Nizam Bin Osman for the continuous support of my study and research, for his patience, motivation, enthusiasm, and immense knowledge. He had consistently permitted this paper to be of my own work, but yet steered me in the right the direction whenever he thought I required it. I could not have imagined having a better supervisor and mentor for my study and I am privileged.

Besides my supervisor, I would like to thank Dr. Nor Azura Binti Adzharuddin, a member of my thesis committee for her encouragement and insightful comments.

I would also like to acknowledge Mr. Rohaizad Mohamed, my mentor and my boss for providing me with unfailing support and continuous encouragement throughout my years of study and through the process of researching and writing this thesis.

Last but not the least, I would like to thank my family, friends and colleagues for supporting me profoundly throughout the composing of this thesis and be part my life in general.

To all, thank you so much for your help and support during this endless journey of knowledge. I am forever grateful.

I certify that a Thesis Examination Committee has met on 26 October 2016 to conduct the final examination of Soo Poh Lee on her thesis entitled "Relationship between Acceptance of Smartphones and its Influence on Users' Behavior among University Students" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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Declaration by graduate student

I hereby confirm that:
- this thesis is my original work;
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Declaration by Members of Supervisory Committee

This is to confirm that:

- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2012-2013) are adhered to.

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Signature:
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Supervisory Committee: <u>Dr. Nor Azura Binti Adzharuddin</u>

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LIST OF ABBREVIATIONS

IM	Instant Messages
IUKL	Infrastructure University Kuala Lumpur
MCMC	Malaysian Communication and Multimedia Commission
PEU	Perceived Ease of Use
PIHE	Public Institutions of Higher Education
PU	Perceived Usefulness
PVIHE	Private Institutions of Higher Education
SAS	Smartphone Addiction Scale
SMS	Short Message Service
SPSS	Statistical Package for Social Science
TAM	Technology Acceptance Model
UiTM Shah Alam	Universiti Teknologi MARA Shah Alam
UKM	Universiti Kebangsaan Malaysia
UNITAR	UNITAR International University
UPM	Universiti Putra Malaysia

CHAPTER 1

INTRODUCTION

1.1   Introduction

Science and technology have been part of the human life and it cannot be separated and it constantly evolves. As human lives in the modern world of science and technology, there is an obvious paradigm shift in the world of communication and information technology. The shift in the communication and information technology has changed dramatically the human behavior and the cultural norms. The most influential advancement in science and technology is the emergence of smartphones that bring into the existence of the social media revolution and transformed human communication.

Due to the advancement of smartphone technology with computing capabilities, capacious memories, large screens with lots of features and applications, it has taken the world by storm (Safwat, Adel, George & Sobhy, 2012). It has also now become part of human life ecosystem. In the past, mobile phones were well known for only making voice calls with basic and limited features such as number keypad, a pick-up or hang-up buttons, a phone book and that is the only features which are offered to the users at that period of time. Today, having a smartphone is very similar in having a small computer with all the powerful computing capabilities in a pocket.

The booming of smartphone in the market is now the key driver of consumer technology where it has created a completely new emerging revolution in communication technology. How the information is being consumed nowadays as compared to the past has evolved very much from reading the newspaper, watching the television, communicating and browsing information from the Internet by using a desktop computer or a laptop to now via a smartphone. Portability, mobility and connectivity of smartphone have now been the choice and preference when consuming information and this has undoubtedly impacted the way of human living. One of the most impactful smartphone features that has changed traditional communication is the short messaging system (SMS) where it can now include video messaging, graphic messaging and as well as virtual notes for instant messaging system.

Smartphone technology has actually made human lives so convenient that as if the world is in the human palms. It had changed the cultural norms and behavior of individuals (Muhammad Sarwar & Tariq Rahim Soomro, 2013). The smartphone has additionally created a culture where individuals are "always connected" to their communities and peer groups (Agar, 2004). The emergence of smartphone technology has not only changed how information is being consumed, but it has changed how human communicate and use the technology. This has also introduced an "anytime and anywhere" connectivity platform whereby it offers real time access

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to online information for various forms of content consumption that includes multimedia and games.

1.2   Background of Study

The features in the current modern day's smartphone are a technology convergence of conventional phone, a personal computer and the Web (Madianou, 2014). The fundamental operational feature of a smartphone is to have an open operating system and having the ability to be connected to the Internet. A device like a smartphone with its own operating system will act like a mini computer and this will then enable any smartphone to run on it with any downloadable application from the Internet. There are thousands of applications libraries in the market with a very smart interface tailored to suit the users' needs that can be instantly downloaded to the device.

The smartphones are generally equipped with standard function such as displaying photos, playing video games, offer navigation ability, built-in camera, recording audio and video, sending and receiving email, web browsing and Wi-Fi connectivity (Muhammad Sarwar & Tariq Rahim Soomro, 2013). Due to the advancement, rapid progression in its features and influence of human behavior, smartphones has been the most rapidly growing technology in the world history. This is evident in Southeast Asian countries where smartphones sales are growing rapidly. According to GfK Asia Report (2014), smartphone sales from September 2013 to August 2014 in seven markets of Southeast Asia countries had reached 120 million units that had generated more than USD 16.4 billion. The seven key markets in the survey included Singapore, Malaysia, Thailand, Indonesia, Vietnam, Philippines and Cambodia. Whereby, Todd Ashton, Ericsson's president in Malaysia cited that the smartphone subscriptions are expected to grow about five times, reaching more than 700 million in the Southeast Asia region by 2019 (Khoo, 2014).

The smartphone demand and smartphone sales in Malaysia are growing continuously on its uptrend. According to an analysis by the Ericsson Consumer Lab in Southeast Asia, the smartphone penetration rate in Malaysia has increased by 63% in the year 2013 from 47% in the year 2012 (The Sun Daily, Sep 2013). Additional, GfK Asia Report (2015) highlighted that the smartphone market in Malaysia has sustained a positive growth in the year 2014 with total annual sales of 8.5 million units worth USD 2.66 billion.

Statistically, one out of two Malaysians is a smartphone user now where 53.4% of users who participated in the Hand Phone Users Survey 2014 conducted by Malaysian Communications and Multimedia Commission (MCMC). This report also discovered that the top three aged group of smartphone users were none other than the younger generation aged between 20-24 (24.5%), 25-29 (18.8%) and 30-34 (14.0%). According to the latest Measuring the Information Society Report by ITU (as cited in Lim, 2013), Malaysia leads with 75% of its youth are digital natives in the developing economy countries in Asia. This is not surprising as the Digital Age

has already begun in this period of time. In addition, more than 90% of youth (age 16-24) are using a smartphone according to the Ericsson Mobility Report (Goh, 2014).

The smartphone ownership among the undergraduate students in Malaysia was a record high. According to MCMC (2015), 70% of undergraduate students own a smartphone. This high smartphone adoption rate among university students indicates that they are the early adopters of smartphones. Based on a recent research conducted by Muliati Sedek (2014), the smartphone utilization level for communication and collaboration purpose was high among the undergraduate students. The findings were also supported by a study conducted by Jambulingam and Sorooshian (2013), who found that undergraduate students aged group 18 to 24 frequently used smartphones for SMS text messaging, playing games, listening to music, sending and receiving emails and participating in social network sites such as Facebook. Thus, what can be derived from the statistics was that there is a rapid smartphone growth in Malaysia, especially among the youth and undergraduate students.

1.3 Problem Statement

The advancement of smartphone technology has successfully attracted the younger generation attention. Today, undergraduate students depend very much on their smartphones as they realized it is more user friendly and its endless features and usefulness when compared to existing feature phone can provide. However, the excessive usage of smartphones can be problematic too, where there is evidence to suggest that there are several negative impacts on the user (Turel, Serenko & Giles, 2011), such as academic failure (Cagan, Unsal & Celik, 2014); dependency (Park, Kim, Shon & Shim, 2013); addiction (Hong, Chiu & Huang, 2012), stress and impacts on social life (Lapointe, Boudreau-Pinsonneault & Vaghefi, 2013).

Smartphones have become an inseparable part of an undergraduate students' life. This is due to the smartphone functionalities which to assist them in their university's assignment and coursework (Norazah Mohd Suki & Norbayah Mohd Suki, 2013). Given the features offered by any smartphones, users are likely to become more dependent on smartphones when they consistently continue using it (Tian, Shi & Yang, 2009; Park *et al*., 2013).

A survey conducted by Falaki, Mahajan, Kandula, Lymberopoulos, Govindan and Estrin (2010) stated that 90% of undergraduate students use their smartphones within the next seconds after waking up from sleep in the morning. It was supported by Bjorn (2011) study that suggested above 50% of smartphone owners make use of their devices immediately after getting up in the morning and the usage levels have raised since then at lunchtime to rush hour. Thus, many undergraduate students could not imagine not having their smartphone on a daily basis. In a nutshell, the users' behavior demonstrates that they have a strong attachment to their smartphone and highly dependent on their smartphone in their day-to-day life activities. When they were asked about their relationship with smartphones, many choose to describe it as

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an essential item, which never gets out of their side (Vacaru, Shepherd & Sheridan, 2014). They will feel something incomplete for the day and disadvantage in running their daily activities without a smartphone with them. This has a major influence on undergraduate students' behaviors and drastically impacts their personal lives too.

The time spent on using smartphones has increased drastically, resulting in addictive tendency of smartphones usage (Lee, 2013). The smartphone excessive usage caused by the habitual checking habits on missed calls or messages may lead to smartphone addiction among the users (Bianchi & Philips, 2005; Oulasvirta, Rattenbury, Ma & Raita, 2012; Takao, Takashi & Kitamura, 2009). According to Kim (2013), addiction to smartphone has induced serious problem, especially among the undergraduate students. Smartphone addiction can be defined as over-attached to the device with continuous usage despite of the negative outcomes (Walsh, White & Young, 2008).

Ofcom's Communication Market Report (2011) found that almost two-thirds of undergraduate students were highly addicted to smartphones, while half of them even admitting using it in the bathroom. According to Falaki *et al.*, (2010), smartphone users are using their smartphone intensively with an average interaction of 10 to 200 times per day and the usage mean length are between 10 to 250 seconds. Oulasvirta *et al.* (2012) claimed that smartphone users check their smartphone at an average 34 times a day not because they are obligated to do it but merely due to habitual reason. MCMC (2015) found that 79.7% of the users constantly check their smartphone even when it does not ring. Cagan *et al.*, (2014) looks serious into smartphones addiction among undergraduate students because the more they get addicted to it the more obvious in their academic failures. Other negative impacts that arisen from smartphone addiction includes time management and academic failures (Hong *et al.*, 2012). They found daily smartphone use is associated with academic performance among the female university students in Taiwan.

Lepp, Barkley and Karpinski (2014) findings had indicated a high frequency of undergraduate's smartphone users spent less time concentrated on their academic pursuits because majority of their time was spent on using their smartphones. Junco, Merson and Salter (2010) observed undergraduate students consistently display higher levels of attachment to their smartphone, which could distract their focus on academic as majority of their time had dedicated to interacting with their smartphone. There is a high tendency of the undergraduate students interacting with their smartphone in their classes or in their lecture sessions, either responding to messages or browsing through the Internet. There is no doubt that it will affect their concentration level during their lecture sessions. Even when they are outside of the classroom environment, most of them devoted so much time chatting and socializing themselves through the social network using their smartphone. In other words, the time they should be devoting themselves to their studies and other useful academic endeavors are thus fluttered away (Ezemenaka, 2013). As time spent on smartphones increases, the academic performance is seen to be deteriorating.

Past research focused on the smartphone and its impact on traditional face-to-face communication (Leung, 2008). Try to observe the people around today. How many of them are down looking at their smartphone? How many are typing, scrolling and thumb typing, setting aside their focus from everything else around them (Gerlach, 2012)? The current phenomenon due to smartphone influence now is hardly seen family members speak or interact the traditional way to each other during family meals, where the focus was very much on interacting with their smartphones. This negative behavior could lead to a dysfunctional family and could even lead to disappointments and argument between spouses and family members (Lim, Wong, Farik Zolkepli & Rasgvinjeet, 2012). It is proven that the smartphone usage had created a barrier with the person who is physically present in front while another party is busy interacting with another person with a smartphone. Undoubtedly, smartphone usage is affecting the relationship because it permits human to be always connected, but likewise it keeps them even more disconnected from each other (Kerner, 2013).

Smartphones can be considered as one of the major technological advancement in human history. However, its introduction into the human life cycle does not necessarily contribute a 100% positive impact. It has developed the sense of "keep up with the times" amongst the users that directly influence their level of attachment to their smartphones which in turn led them to excessive use and establish within themselves a considerable stress level. British psychologist Richard Balding claimed that smartphones could actually increase people's stress levels (Collins, 2012). Based on his research on 100 respondents that includes undergraduate students, many reported of unhappy feeling or being stressful when their phones were turned off or when they did not receive any new messages. They have developed a psychological attachment to their phones. It affects mostly the younger people generation where they will panic or feel so distressful to the extent not being able to focus on their studies when their smartphones are not with them. They are likely to be suffering from "nomophobia". According to Dixit, Bhagwat, Bindal, Goyal, Zaisi and Shrivastava (2010), nomophobia literally means fear of not being in contact with the mobile phone. If a person loses their phone or is in an area of no network coverage or worse still his smartphone is running out of battery or credit, the person could easily develop a compulsive behavior which could adversely affect his concentration level.

Other problems caused by smartphone are, some people may think their phone is ringing when it is not; they perceive vibrations from smartphones that are not really vibrating (Drouin, Kaiser & Miller, 2012). This condition is also known as cellphone a vibration syndrome that refers as a sign of a serious technology addiction. Wall (2014) claimed that the typical sign of "always on" generally would produce stress from a smartphone. This is merely due to the excessive levels of connectivity that has resulted in a rise of stress levels. The studies had also suggested that if a person remains connected or reachable at all-time, perceived suffering from stress could not be avoided (Thomee, Harenstam & Hagberg, 2011). The ability of smartphones to provide real-time connectivity among friends and family members had led to smartphone users able to respond immediately to any incoming email, text, tweet or alerts. Whilst it is very important to be easily and readily be contactable, this can be also a disadvantageous situation as contact may occur at inappropriate times. For

example, it will be annoyed if received incoming call when having leisure time or when doing something that requires full concentration without any disturbance. Thus, the smartphone usage can increase the stress level (Lapointe *et al.,* 2013). In addition, Collins (2012) and Mozes (2012) found that the more often someone checks their phone, the higher they will develop their stress level. On the other hand, Sayrs (2013) work on the effects of smartphone users on stress, productivity, boredom and loneliness revealed that high smartphone usage has high influence stress level increase.

A number of studies have established the correlations between high levels of smartphone use and the deterioration of human mental health. It had caused an adverse effect in the realms of psychological well-being, interpersonal relationships and physical health (Kim, Lee, Lee, Nam & Chung, 2014). For instance, depression (Bianchi & Philips, 2005), anxiety, learning disorder, withdrawal symptoms are the results due to habitual overuse of smartphones (Choi, 2012). The side effects reported were long term memory impairment, sleep and concentration problem that might affect their academic performance (Arwa Jamal, Reham Sedie, Khadijah Abdul Haleem & Najla Hafiz, 2012). It has been found that excessive smartphone usage has increased restlessness lifestyles and greater susceptibility to stress (Munezawa, Kaneita, Osaki, Kanda, Minowa, Suzuki, Higuchi, Mori, Yamamoto & Ohida, 2011).

Arwa Jamal *et al.* (2012) asserted that a considerable number of the students reported risky behavior on smartphone usage while driving as it has consistently caught the attention of the public as a result in diversion of attention and possibly causing an accident while using smartphone during driving. A past study revealed that 64% of the respondents who use smartphone while driving could have a detrimental outcome. These findings posed a major concern, as smartphone users seemed willing to take the risk and compromise their safety. Malaysia has been ranked 20th by The World Health Ranking 2011 with most of the deaths caused by road accidents (Aina Nasa, 2014). Wong (2014) claimed that Malaysian drivers have been evaluated as the worst in the region by killing themselves on the road. According to the Road Transport Department (JPJ) director, Datuk Ismail Ahmad, using telecommunication devices while driving or riding is a serious offense because major road accidents are due to driver or rider were distracted while using these devices while driving (Zuhrin Azam Ahmad, 2013). While on the move in their vehicle, Malaysian motorists are very good at performing multi-tasking activities such as texting, SMS-ing or WhatsApp-ing while driving or even while riding on their bikes. This bad habit and culture while driving had contributed to the deaths of some motorists.

In a nutshell, smartphone users among the undergraduate students are now increasing rapidly. They are constantly connected and networked with their peer groups by smartphones which make technology as an integral part of their life. For a decade now, they have been spending a considerable amount of time scrolling, typing and even head down and glued to their smartphone screen. In the light of the problems associated with smartphone usage, yet there is little research has been conducted to address the gap on the smartphones acceptance and its influence on the users'

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behavior. Due to the exponential growth in smartphone usage for personal use as well as educational domain among the undergraduate students, it is important to understand the impact on how smartphones can shape the users' behavior especially among the undergraduate students. Drawing on the theory of Technology Acceptance Model (TAM), this study aims to address and complement the gap by examining the relationship between the acceptance of smartphones and its influence on users' behavior by analyzing the underlying issues (dependency, addiction and stress) concerning smartphone usage among the undergraduate students.

1.4   Research Questions

The purpose of this study is to expand the knowledge gap in relation to the smartphone influence on users' behavior. Thus, a number of research questions are raised:

RQ 1:   What are the smartphone usage patterns among the undergraduate students?
RQ 2:   What are the undergraduate students' perceptions about the perceived usefulness of smartphone?
RQ 3:   What are the undergraduate students' perceptions about the perceived ease of use of smartphone?
RQ 4:   What is the influence of smartphone on users' behavior among the undergraduate students?
RQ 5:   What is the relationship between smartphone perceived usefulness and its influence on users' behavior?
RQ 6:   What is the relationship between smartphone perceived ease of use and its influence on users' behavior?

1.5 Research Objectives

The general objective of this study is to examine the relationship between acceptance of smartphone and its influence on users' behavior among the undergraduate students in Selangor, Malaysia.

The specific objectives of this study can be listed as below:
RO 1:   To identify the smartphone usage patterns among the undergraduate students.
RO 2:   To determine the perceived usefulness of smartphone among the undergraduate students.
RO 3:   To determine the perceived ease of use of smartphone among the undergraduate students.
RO 4:   To determine the influence of smartphone users' behavior among the undergraduate students.
RO 5:   To examine the relationship between smartphone perceived usefulness and its influence on users' behavior.
RO 6:   To examine the relationship between smartphone perceived ease of use and its influence on users' behavior.

1.6   Significance of Study

Theory

This study is seen significant especially concerning the extension of theory, practice and methodology. First, the study investigates the relationship between smartphone acceptance and its influence on the users' behavior among the undergraduate students in Selangor, Malaysia. This is an important theoretical contribution because of the exponential growth in smartphone usage, particularly among undergraduate students in this country. By analyzing the factors of acceptance of smartphones, an understanding of its influence on the users' behavior is crucial. This new development requires the attention from the academician, as the undergraduate students are the nation builder of the future.

Practice

The significant of the study is also seen relevant in terms of practice where the findings of this study can be suggested to be practiced by the relevant parties concerned, especially young people who are very attached to their smartphone usage. There is also significant in practice and implementation as a result of the study. Considering the influences of smartphones on its users' behavior, this cautioned against the severity of the impact of excessive use of smartphones on the current and next generation. The responsible government agencies as well as the non-profit organizations (NGOs) should seriously play a role to look into this issue and take preventive action plans to deal with the issue.

Methodology

The quantitative method conducted via a survey has been adopted as the main approach of data collection for this study. The advantage of using survey in this study is that the findings are reliable and valid to represent the current phenomena. The undergraduate students selected to participate in this survey were the typical fast-growing smartphone users and can represent the largest proportion of the smartphone users. The variables used in this study can be used to examine the relationship between undergraduate students' acceptance of smartphone and its influence on users' behavior. Therefore, this study could also potentially discover new findings related to the usage and acceptance of smartphones among undergraduate students.

1.7   Scope of Study

The study had focused on the undergraduate students who own and utilized the functions of a smartphone. Undergraduate students are the young generation pursuing trendy gadgets in any new technology driven products. Consequently, respondents were asked if they owned a smartphone such as an iPhone, Samsung, Blackberry or HTC. Respondents who owned a smartphone were then invited to participate in the survey. Only mobile phones with "smart features" and having an

embedded operating system would allow an add-on application to run on top of it (Yu, 2013).

This research targets undergraduate students, as they are the typical fastest growing smartphone users in the country. Undergraduate students tend to accept electronic devices and gadgets ahead of everyone else compared with other demographic groups. The smartphones market data analytics indicated that undergraduate students are early adopters and they are reported to be the largest groups of smartphone user. According to the report by MCMC (2015), the primary smartphone users were the younger generation aged between 20 to 24 years old. Thus, the focus of this study is on the undergraduate students aged group of 20 to 24 years old enrolled in the bachelor program from the selected Public Institutions of Higher Education (PIHE) and Private Institutions of Higher Education (PIVHE).

1.8   Limitation of Study

Limitation of study can be defined as the uncontrollable restrictions that potentially affect the internal validity of a research (Nenty, 2009; Ellis & Levy, 2009). There are few limitations noted in this study. Firstly, the process to conduct the survey at three PIHEs and three PIVHEs were time-consuming and has taken quite a considerable time to be completed, leaving not much time for data collection and data analysis.

The second limitation is the geographical location. The questionnaire was only distributed to limited three PIHEs and PIVHEs respectively in Selangor. This has somehow limited the research findings on the acceptance of smartphone and its influence among undergraduate students in the higher institutions in Selangor. Furthermore, the sample for this research has been restricted only to the Selangor area. Therefore, the research findings only address undergraduate students in Selangor and cannot be generalized to the total undergraduate student population in Malaysia.

Lastly, this result finding may not be applicable to all smartphone users as the sample size only address limited group of the targeted audience. Different profiles of smartphone users may have different influence on users' behavior. By narrowing down the smartphone profiles of smartphone users in this study, the relationship between the acceptance of smartphones and its influence on users' behaviors can be analyzed accurately.

1.9   Definitions of Keywords

In this study, there are a few keywords that have been identified. The keywords in this study are "acceptance", "smartphone", "influence", "users' behavior", "undergraduate students", "perceived usefulness", "perceived ease of use", "smartphone stress", "smartphone dependency" and "smartphone addiction".

9

"Acceptance"

User acceptance can be defined as users' willingness to make use of information technology to support their execution of tasks. This is not applicable to the situations in which the users claim they will utilize it without demonstrating use evidence, or use for an intended purpose by the designers and procurers (Dillon & Morris, 1996). In this study, smartphone acceptance refers to a process whereby an individual who employs and utilize function of the smartphone for intended purposes.

"Smartphone"

The smartphone is a multipurpose device that has similar functions to a handheld computer whereby it offers more advanced computing power (Mohd Azam Osman, Maziani Sabudin, Azlan Osman & Tan, 2011). Additionally, smartphones offer sophisticated features and functionalities with better capacities to support audio and video streaming, text messaging, navigation, e-mail, Personal Information Management (PIM) and business productivity applications (Chang, Chen, & Zhou, 2009). In this study, smartphone plays a very important role because the acceptance of smartphone may influence the user' behavior.

"Influence"

Influence is the ability to change the behavior of others in an intended direction (Cohen, Morgan & Pollack, 1992). In simplicity, it can be defined as the process in making individuals make changes to their thoughts, feelings, attitudes or behaviors. In this study, a smartphone can influence the users physically, mentally, emotionally and in many ways that they never had thought about it.

"Users' Behavior"

According to Meyer (2009), "behavior" refers to an individual's response or conduct when the individual is in a particular situation. Users in this study are those undergraduate students who owned and utilized smartphone. The user's behavior refers to the responses given by the users as a result of a particular phenomenon, which is triggered by their inner emotions, feelings, or perceptions of the user's experience. In the case of a smartphone users' behavior, the results of the undergraduate students' behavior from using a smartphone can be referred to as their reaction on their inner emotions and feelings.

"Undergraduate Students"

Undergraduate students are students who are still pursuing their studies in their first degree in the universities. In this study, undergraduate students who are also the subject of the study refers to degree program students from UKM, UPM, UiTM Shah Alam, Taylor's University, IUKL and UNITAR International University.

"Perceived Usefulness"

Davis (1993) defined Perceived Usefulness (PU) as the degree to which an individual believes adopting a particular technology would enhance or improve his or her job

performance. Similarly, Mathwick, Malhorta & Rigdon (2001) defined PU as the extent to which an individual deemed a particular system able to boost his or her performance. In this context, perceived usefulness can be defined as the degree to which undergraduate students believe that using smartphone would improve their life quality and would also be a tool to enhance their productivity and efficiency in their daily activities.

"Perceived Ease of Use"

Perceived Ease of Use (PEU) is defined as the degree to which an individual expects the particular technology to be ease and free of effort. In this context, it refers to undergraduate students believe that using a smartphone would be free of effort (Pan, Chen & Patrick Rau, 2013). In addition, PEU refers to the mental effort required to interact with smartphone, ease of getting the smartphone to do what is required and ease of use of smartphones.

"Smartphone Stress"

In this context, smartphone stress refers to the phenomenon whereby the smartphone users are experiencing stress due to information and communication overload; therefore, excessive smartphone usage is associated with techno-stress (Ragu-Nathan, Tarafdar, Ragu-Nathan & Tu, 2008). Whereby the excessive usage of smartphone can be an indicator of stress induction.

"Smartphone Dependency"

Dependence is a behavioral state that has been found to correlate with problematic issues in individuals. In this context of study, smartphone dependency is being conceptualized as having a strong propensity for continuous high usage, being engaged and unwilling to be apart from it (Ting, Lim, Patanmacia, Low & Ker, 2011).

"Smartphone Addiction"

Smartphone addiction is a form of Information Technologies (IT) addiction and it is different from alcohol and drug addiction where the former are behavioral and not substance dependent (Deursen, Bolle, Hengner & Kommers, 2015). According to Kwon, Kim, Cho and Yang (2013), it can be described as uncontrolled usage behavior, neglecting daily activities and frequent checking on the mobile devices.

1.10   Conclusion

The first chapter presented the introduction and foundation to the research background, essential understandings of the problem statement, research questions, research objectives and the significance of the study. It also identifies a number of variables that may affect users' behavior on smartphones usage. Finally, it presents the scope of the research, limitation and definition of keywords in this study. In the following chapters, the relevant literature will be reviewed more in-depth.

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