

THE SMARTPHONE TECHNOLOGY ACCEPTANCE AMONG MALAYSIAN YOUNG ADULTS

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Abstract: Smartphone technology can be characterized as multi-function device that helps people to manage their task. This study is being emphasized because there is no legitimate answer in Malaysian context whether perceived usefulness had contributed an impact on smartphone technology acceptance. Therefore, there is a need to explore how perceived usefulness affect smartphone technology acceptance among Malaysian young adults. This study was conducted using (TAM) model to capture detailed view about perceived usefulness and the relationship with smartphone technology acceptance among Malaysian young adults. The findings of this study confirmed that perceived usefulness drives the smartphone technology acceptance among Malaysian young adults and it cannot be denied that the advanced features of smartphone technology had influenced Malaysian young adults to possess smartphone technology and make use of it for their personal tasks.

Keywords: *Smartphone technology, Technology acceptance model, young adults, perceived usefulness, Technology Acceptance Model.*

1. Introduction

Smartphone device have been seen as an outstanding evolution in technology in a short period which undoubtedly became one stop platform to satisfy people's needs. Smartphone technology was adopted by many sectors such as education, health, banking, travel, defence and more which then became a useful device in improving user's experience [1]. The reason behind this huge popularity is because smartphones replace computers in functionality aspects which are equipped with huge storage capacity, high speed processors built-in with camera, games, navigation and other beneficial application which obviously became such potential goldmine for technology adopters [2]. The availability of free applications for smartphones due to open source that has been introduced by Google Company was one of the main reasons why smartphones attract millions of subscribers [3]. Moreover, Google Company has provided software Development Kit (SDK) for android users which allow the users to develop and download their favourite applications using sandbox concept. Besides, [4] stated that the increase of smartphones usage among consumers raises the availability of various smartphones applications in market.

The smartphone adoption among Malaysian young adults is growing drastically and it can be found in the statistic provided by Malaysian Communication and Multimedia Commission (MCMC) [5] in 2011 where the total of 3G users in Malaysia was 10.3 million and this number had increased to 14.5 million in 2012 and 18 million in 2013. Smartphone technology has its unique characteristic than contemporary mobile phone (basic phone). Basic phones are only suite to send text messages and voice calls while smartphones allow the users to alter the purpose of their device by installing applications that transform their smartphone into navigator, dictionary, personnel scheduler, digital camera which makes them be the super user [6]. When consumers viewed smartphones as a necessity, they perceived to be overly dependent on their smartphones and have a strong propensity for continuous usage making the smartphone an integral part of their everyday life [7].

To develop the frame work of this study the Technology Acceptance Model (TAM) introduced by Davis (1986) [8] was adopted. This is because (TAM) is a well known theory that was used by many authors to predict users' adoption behaviour towards the technology [9]. There are four variables in (TAM) model; it perceived ease of use (PEU) perceived usefulness (PU), Attitude (A) and Behavioural intention (BI). However in this research, only three variables i.e. PU, PEU and BI are being used to investigate smartphone technology acceptance among Malaysian young adults. In reference to this

study, PU defines the extent to which an individual believe that using smartphone technology will improve his or her job performance. Meanwhile PEU was defined as the degree to which a person believes that using smartphone technology would be free of effort and BI defines positive or negative feelings that Malaysian young adults hold on smartphone technology.

2. Literature review

Technology Acceptance Model (TAM) was found by Fred Davis [8] which was developed from Theory Reasoned Action (TRA) by introducing two new variables which are perceived ease of use and perceived usefulness and he firstly used the TAM model to predict users' acceptance towards information technology [10]. The TAM model was used by many scholars in various fields purposely to measure the utility and usability which influenced technology acceptance which determined how users applied that technology in specific task [12]. Besides, [11] stated that TAM is one of the most influential models that have been widely used by many authors to predict the adoption behaviour of the user towards the technology. Moreover, the two component in TAM; perceived ease of use and perceived usefulness are the most powerful influencer that can be manipulated and generalised across any different settings [2].

There are several studies that have been carried out using TAM model. [13] investigated the relationship between mobile learning adoption and self-efficiency and the outcome of the research conveyed that the level of users' experience with mobile will influence their perception and ease of use of mobile learning. Meanwhile, [15] investigated on the internet usage differences between male and female and the final outcome of the research testified that PEU strongly affect female student compared to male student in using internet. Apart from that the usefulness features that are available in smartphone such as high processing speed with high-performance hardware and the ability to connect to the internet anywhere trough Wi-Fi (Wireless Fidelity) network and also larger screen size are the major reasons behind drastic increases in M-banking adoption among Korean people [15] while [16] stated that when a person use the technology for effective purpose such as playing computer games, listening to music, surfing the internet will make the users tend to attach more to PU of high-utilitarian to that technology.

Meanwhile [17] stated that external stimulation like social effect directly influenced individual behaviour and indirectly affected their behaviour to use certain technology. On other hand different types of users have different attitudes and behaviour towards the acceptance of mobile commerce [18]. With the advanced micro-computing technology in particular smartphones, ubiquitous access for social networking cite by smartphone user was created without limitations thus increasing the social networking addiction among consumers [19]. Moreover [20] also emphasized that consumers will depend heavily on smartphone because of past experience that influenced their future purchase behaviour. Besides, [21] argued that it is important to design a service that adds value and matches the behavioural pattern of the consumers to achieve successful mobile service for consumers' convenience. On the other hand [22] had found that consumers' satisfaction and probability of switching behaviour were influenced by the attractiveness of that particular product.

3. Methodology

This paper is aimed to explore the smartphone technology acceptance among Malaysian young adults. Furthermore this study was conducted among undergraduate and post graduate students of Universiti Utara Malaysia (UUM) with aim to find how this three factors; PU, PEU and BI affect the smartphone technology acceptance among Malaysian young adults. In this study, PU and PEU are the independent variables and BI is used as the dependent variable. The reason why postgraduate and undergraduate students were chose as sample is simply because they perceived to be mature and going to face the real job market soon. Moreover this group has the most potential power to purchase any smartphone they prefer. By conducting research on this group, it will give a clear figure about radical transformation of smartphone technology and at the same time contributes to the understanding of Malaysian young adults smartphone technology consumption behaviour.

To develop the questionnaire of this study, all items were adapted from [8]. Some minor changes were made on the sentence of questionnaire using smartphone technology context. The questionnaire was purposely developed to seek information from students about their interest, intention and perception towards smartphone technology. This study was accomplished by conducting five-point-likert-scale questionnaire survey and more than 500 questionnaires were randomly distributed using scientific approach. The SPSS 19.0 package was used to calculate frequencies, means, percentage, Chi-square test, reliability (Cronbach coefficient), Pearson correlation (PCA) and factor analysis.

This study employed simple random sampling method in collecting the data as stated [23] that this method will help to understand the characteristic of the sample. Non-response bias test was conducted between early and late respondents in relation to compare mean score between PU, PEU and BI to ensure the data is free from non-response bias. The reason why non-response bias test was conducted is because according to [24] early and late respondents have different characteristics.

4. Findings

4.1 Respondent profile

Table 1: Summary of Gender

Items (Variable)		Frequency Total= 427	Percentage (%)
Gender	Male	140	32.8
	Female	287	67.2
	Total	427	100

There were only 427 usable questionnaires identified at the end of data analysis process. The demographic data indicated that majority of respondents are females which are 287 students or (67.2%) while there are only 140 (32.8%) male students.

Table 2: Summary of smartphone usage

Items (Variable)		Frequency Total= 427	Percentage (%)
Period of using smartphone	Less than a Year	161	37.7
	1 year to 3 years	190	44.5
	More than 3 years	76	17.8
	Total	427	100

Table 2 shows that period of using smartphone and majority of respondents agreed that they start using smartphone within 1 to 3 year(s) which recorded as 44.5% (190 students) from total responds rate while 37.7% (161 students) answered that they use smartphone less than a year and 17.8% (76 students) stated that they used their smartphones more than 3 years.

Table 3: Non-response bias

Variable	Early response rate		Late response rate		t-value
	Mean	SD	Mean	SD	
PEU	1.74	0.40	1.77	0.48	-0.637
PU	4.09	0.48	3.85	0.57	4.474
BI	4.34	0.43	4.19	0.50	3.300

The independent t-test (non- response bias test) was conducted to compare the mean score between early and late respondents. The low response rate will cause the non-response Bias which will affect during validity analysis. Moreover, the total response rate of this study was larger than the minimum recommended respond rate as suggested by [25]. The result of non- response bias test indicated that the variance value of early and late respondents was equal. Thus it is not necessary to analyse the data of two groups separately.

4.2 Factor Analysis and Reliability Analysis

Factor analysis was conducted to reduce wide range variable number into manageable groups [25]. On other hand, [26] stated that the factor analysis was used by many authors to determine the construct adequacy of a measuring device. After finished the data collection process, the gathered data were preceded to Confirmatory factor analysis (CFA) process to measure the internal consistency of the measurement model. There are 8 items were deleted from PEU and one items from BI during Confirmatory Factor Analysis (CFA) process which have the communality value below 0.50 and cross-loaded more than one component. However no variable was omitted from PU during factor analysis process this because the communality value of all items in PU was above 0.5.

Table 4: Factor analysis for independent variables

Code	Item	Loading
Perceived usefulness		
PU1	Using smartphone technology improves the quality of the work I do.	.636
PU2	Using Smartphone technology gives me greater control over my work.	.656
PU3	Smartphone technology enables me to accomplish tasks more quickly.	.693
PU3	Smartphone Technology supports critical aspects of my job.	.713
PU4	Using Smartphone technology increases my productivity.	.771
PU5	Using Smartphone technology improves my job performance.	.777
PU6	Using smartphone technology allows me to accomplish more work than would otherwise be possible.	.724
PU7	Using smartphone technology allows me to accomplish more work than would otherwise be possible.	.755
PU8	Using smartphone technology enhances my effectiveness on the job.	.745
PU9	Using Smartphone technology makes it easier to do my job.	.649
PU10	Overall, I find the Smartphone technology is Useful in my job.	.636
Eigenvalue: 2.849		
Variance: 49.716		

Reliability: .908		
Perceived Ease of use		
PEU1	I find Smartphone technology is complicated to use.	.747
PEU3	Interacting with the smartphone technology is often frustrating.	.670
PEU6	Interacting with smartphone technology requires a lot of mental effort.	.719
Eigenvalue: 1.527		
Variance: 56.356		
Reliability: .537		

Table 4 indicates the factor analysis result for the first independent variable PU indicates the communalities variance of 49.7 percent with Eigen value of 2.849 which is above minimum value suggested by [25]. Besides the second independent variable PEU was explained as 56.3 percent with Eigen value of 1.527. As expected, all loading value for this research is above 0.5.

Table 5: Factor analysis for dependent variable

Code	Item	Loading
Behavioural Intention		
BI 1	I like using smartphone technology.	.745
BI 2	I feel good about using smartphone technology.	.721
BI 3	I think positively toward using smartphone technology.	.725
BI 4	I intended to use smartphone technology.	.729
BI 5	I predict that I would use smartphone technology.	.752
BI 6	I plan to use smartphone technology.	.782
BI 7	I intend to be a heavy user of smartphone technology.	.660
BI 8	I intend to use smartphone technology in near future.	.758
BI 9	I am willing to use smartphone technology.	.770
BI 10	I will use smartphone technology in regular basis in near future.	.691
Eigen value: 8.828		
Variance: 36.785		
Reliability: .917		

Table 5 indicates the summary of factor analysis for dependent variables BI of smartphone technology acceptance. The BI was explained 36.7 percent variance through varimax rotation and the eigenvalue value is 8.828. As expected the result of loading value for BI was above 0.6 [24].

The reliability statistic (Cronbach's alpha) of PU, PEU and BI indicates that all variables are ranging from 0.537 to 0.917 which above the minimum Cronbach's alpha value (0.5) suggested by [25] and [27]. The Cronbach's α was used to examine the reliability of each construct variables [24]. Thus this study assumes that all variables are sufficient enough to conduct further analysis.

Hierarchical Regression analysis

Table 7: Hierarchical Regression analysis test between Perceived Ease of Use (PEU) and Perceived Usefulness (PU)

Mediating variable	R Square (R ₂)	Beta	F	Sig.
PEU	.031	-.177	13.749	.000
BI				

From the regression summary above, the R₂ is indicating bivariate correlation between dependent (behavioural intention) and independent variable (perceived ease of use) where the goodness of fit is explained as 3.1 percent. This indicate that PEU plays less role in terms of mediating toward BI, F= 13.749 and p<.000. The beta value is ($\beta = -.177$) which indicates there is a relationship between PEU and BI. In addition, PEU and BI have significant values at .000 which is less than 0.5.

Table 8: Model summary of for perceived ease of use and Perceived usefulness

Mediating variable	R Square (R ₂)	Beta	F	Sig.
PU	.017	-.129	7.174	.000
BI				.008

Table 8 explains the Hierarchical regression test between PU and BI. The result of R² value is .017, which indicates that BI plays most important role in terms of mediating PU which explains 1.7 percent of the total variance in smartphone technology acceptance among Malaysian young adults. Besides the R₂ value of BI is p<.000 and statistically significant with F=7.174 while PU was p<.008. The beta value is -.129 which reveals that BI has mediation relationship between PU as suggest by [28]

Table 9: Model summary of perceived ease of use, Perceived usefulness and Behavioural intention

Mediating variable	R Square (R ₂)	Beta	F	Sig.
PEU	.261	-.115	74.981	.000
PU				.007
BI				.000

The result of R₂ value is 0.261, which explains 26.1 percent of variance in PU and BI which is statistically significant with F= 74.981. In addition, PEU and BI have the same significant value which is p<.000 while PU was p<.007. The beta value of PEU is -.115 and this indicates that PEU has a mediation relationship with PU and BI. The strength of independent variable (PEU) to predict independent variable (BI) and mediating variable (PU) during regression test is indicating that there is a partial correlation among the variables. There is no multi-co linearity problems were found in this study.

5. Conclusion

This study was an exploration about smartphone technology acceptance among Malaysian young adults. It can be assumed that Malaysian young adults are aware about smartphone technology and they are only concerned about features of the smartphone instead of price. This is supported by [29]; [1] as they agreed that smartphone is the attractive tool for students and majority of Malaysian university students prefer expensive phone and always love to explore what are the latest models available in market. In addition, the simplicity of smartphone technology empowering the user to accomplish their tasks effectively which leads to greater increase in PU. Meanwhile, the advanced capabilities and innovative features of smartphone technology manipulate the Malaysian young engagement and interest to these devices. Therefore, it is concluded that PU encourages Malaysian young adults to have strong desire to engage with the smartphone technology.

6. References

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