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Perception of Young Consumers on Mobile Phone Applications in Malaysia

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Abstract: The main objective of this research is to explore the perception of young consumers on mobile applications in Malaysia. The perception of consumers on M-Commerce applications seems to be positive, especially communication, emergency, entertainment, content delivery and transaction. However, there is a less preference on location factor. The correlations for most of mobile applications are correlated and it is significant either at 0.01 or 0.05. The third finding shows that emergency, entertainment, content delivery, transaction and location have a positive impact on M-commerce. Finally, there is a need for service providers carefully take the needs and considerations of various users into account to provide better services and attract them to M-Commerce because this study found that the overall research model can be considered as not a perfect-fit model.

Key words: M-Commerce • Mobile phone applications • Malaysia

INTRODUCTION

Mobile Commerce (M-Commerce) refers to “any transaction with monetary value that is conducted via a mobile network” [1, 2] and “mobile commerce applications can run in a fixed-topology wireless network (an infrastructure wireless network), such as the cellular network and in an ad hoc network (a non-infrastructure wireless network), in which all users and servers are mobile or portable” [3-5]. M-commerce transactions have been indeed developed among others in an industry-led consortium called MeT-forum, later MeT Ltd [6]. With the rapid development of communication technologies, various kinds of mobile applications have become popular [7]. The emergence of M-Commerce transaction can be grouped into five types, which are Internet E-commerce over wireless access networks, location-based services, ticketing applications, retail shopping and banking [8]. These applications have been made possible through various developments in mobile telephone technology such as GPRS, WAP and the 3G standard [9].

In Malaysia, several major telecommunication operators such as Maxis Communication Bhd., Celcom Malaysia and Digi Telecommunication have been granted licenses to operate the new 3G standard [9]. Broadband Internet service providers are now moving into a second

phase of market development, from marketing broadband as a high-speed Internet access service to an enabler of higher end services such as triple play and digital home concepts [10]. The total number of mobile subscribers in Malaysia is approximately 30,379,000 [11] with a penetration rate of around 106% due to multiple subscriptions. There has been an increase in the popularity of pre-paid mobile telephones following the development of pre-paid systems where the user purchases a fixed amount of access beforehand rather than the traditional system of paying for use afterwards. This convenient system has influenced the penetration rate tremendously, particularly among youth subscribers, who account for more than 30% of the total of mobile subscribers in Malaysia. However, M-Commerce is still a relatively immature technology and is still at the early stage in Malaysia [12].

The main objective of this research is to explore the perception of young consumers on mobile applications in Malaysia. The main reasons to choose this group is young consumers are technology savvy, early adopters of new technologies and always willing to try new things. Rapid changes in mobile applications often attract their attention and they are easily prompted to take on a new promotional package or service. Although there are quite a number of studies on M-Commerce application [13-16],

not many studies have looked at the relationship between young consumers and mobile applications. The second objective is to study the fitness of the research framework based on six factors (communication, emergency, entertainment, content delivery, transaction and location).

Literature Review: M-Commerce is characterised by novel, location based services delivered by a variety of handheld terminals [13] and ubiquitous mobile networks allowing real-time, anywhere or anytime connectivity to services [17]. Development of M-Commerce and M-Payment will depend on some type of convergence or establishment of symbiotic relationships between different actors and systems that exist in a landscape of relevant stakeholders (Figure 1) [18].

M-Commerce transactions are important both conceptually and also pragmatically, especially when the M-Commerce revenues grow [8]. The mobile channel is used not only for distribution and commerce transactions, but also for communications, entertainment and marketing [19]. The mobile channel is a multi-faceted interactive,

inter-operable network composed of various mobile delivery technologies used by companies to market to an individual and deliver communication, personalisation, information and entertainment products and services to individual consumers [20-25]. M-Commerce user requirements focus on functionality, profitability and credibility (Figure 2) [7]. Muller-Veërse [26] estimated that around 90% of current SMS volume is person-to-person communication, with information services, email notification, SMS chat and distribution of ring tones accounting for the remaining 10%. The messaging frame is now being extended to include multimedia message services (MMS), which combine pictures, video and sound [27]. Many brands and media companies include text message numbers in their advertisements to enable interested consumers to obtain more information. This mode of advertising takes advantage of valuable channels of wireless communication to enhance customer relationships and to carry out direct marketing and promotional activities [28, 27].

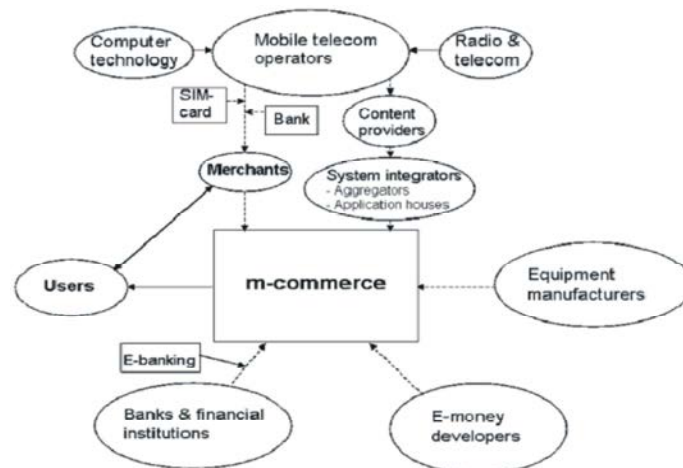


Fig. 1: Actors and Entities Involved in M-Commerce Source: [18]

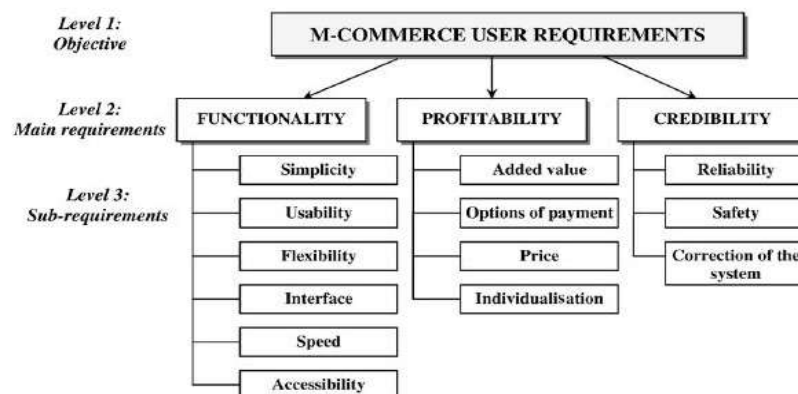


Fig. 2: M-Commerce User Requirements Source: [7]

Thus, Hypotheses Will Be Tested Are:

H1: Overall mobile phone applications have a significant important in Malaysian consumers' acceptance of M-Commerce.

H1a: Communication factor has a significant important in Malaysian consumers' acceptance of M-Commerce.

H1b: Emergency factor has a significant important in Malaysian consumers' acceptance of M-Commerce.

H1c: Entertainment factor has a significant important in Malaysian consumers' acceptance of M-Commerce.

H1d: Content delivery has a significant important in Malaysian consumers' acceptance of M-Commerce.

H1e: Transaction factor has a significant important in Malaysian consumers' acceptance of M-Commerce.

H1f: Location factor has a significant important in Malaysian consumers' acceptance of M-Commerce.

Over the last few decades, mobile applications have been evolving, with a wide variety now in use. Applications have been developed for existing mobile platforms including laptop PCs, PDAs, telephone handsets and specialty pagers. Mobile applications have focused on (a) delivering existing Internet services to the mobile customer, (b) using location sensing to deliver location based information, (c) using location sensing for tracking (fleet services, automobiles, pets, etc.) and (d) using broadband to deliver mobile entertainment content (music, games, etc.). Mahatanankoon *et al.* [29] suggested that usage of M-Commerce applications mainly revolves around buying products, locating friends and family, or receiving instant coupons.

Prior to this, Ankar and D'Incau [30] conducted a consumer survey on mobile applications adoptions in Finland. They found high adoption rates for communications and banking services. However, online games, music, news services and personalized shopping offers received low acceptance rates. The study did not provide reasons behind the different adoption rates for different mobile applications. The Technology Acceptance Model (TAM) has been widely used in many studies to identify factors influencing technology adoption among different consumer groups. Yang [31] surveyed 866 Singaporean students, analysed the results

through a TAM framework and found that consumer perceived usefulness, attitude toward using, perceived ease of use, innovativeness, adoption behaviour and demographic factors were important acceptance variables for M-Commerce. In Malaysia, a study conducted by Toh *et al.* [32] showed that perceived usefulness, social influence, perceived financial cost and trust were positively associated with consumer intention to use M-Commerce. Recently, Li and Yeh [33] found that design aesthetics, customisation, perceived usefulness and ease of use increased trust in M-Commerce.

Kumar and Lim [34] found that age affects mobile service perceptions and loyalty decisions. They found that Generation Y placed more emphasis on emotional value from mobile services, with psychological benefits such as enjoyment and fun being important determinants influencing their satisfaction with and loyalty to mobile services. Noble *et al.* [35] also noted that issues relating to socialisation, feelings of accomplishment and connectedness drove Generation Y consumers' product purchases and retail patronage. Based on a study conducted by Freestone and Mitchell [36], this generation seems technology savvy and willing to adopt new technology. Martin and Bush [37] commented that teenagers are trendsetters for one another and the population at large. They usually received consumption influence or examples from parents, peers, teachers and media. From previous literature, it appears that young consumers are willing to adopt new technology including M-Commerce. Therefore, it is important to find out what M-Commerce applications are important to this group of consumer.

Therefore, Other Hypotheses Will Be Tested Are:

H2a: The perceived communication value has a significant effect in Malaysian consumers' acceptance of mobile application.

H2b: The perceived emergency value has a significant effect in Malaysian consumers' acceptance of mobile application.

H2c: The perceived entertainment value has a significant effect in Malaysian consumers' acceptance of mobile application.

H2d: The perceived content delivery value has a significant effect in Malaysian consumers' acceptance of mobile application.

H2e: The perceived transaction value has a significant effect in Malaysian consumers' acceptance of mobile application.

H2f: The perceived location value has a significant effect in Malaysian consumers' acceptance of mobile application.

H3: Overall of mobile phone application model is fit.

MATERIALS AND METHODS

Primary data for this research was collected using a self-administered questionnaire designed to serve the purpose of the research objectives. The questionnaire was divided into two parts, demographic and consumers' preferences on mobile phone applications. The second part of the questionnaire was designed based on likert scale. Respondents were required to rate the applications based from 'Not important at all' to 'Very important' based on a five-point rating.

With reference to mobile applications suggested from previous studies [30, 38], respondents were asked about their perceived level of importance for various mobile phone applications. Six applications were measured: communication (e.g. short messaging service, chats), content delivery (e.g. read and receive updates, emails, Internet search), transaction based (e.g. online banking, booking, purchasing), location based (e.g. personalised shopping offers, advertisements, alert notification), emergency assistance (e.g. hotline numbers, report of emergencies, roadside assistance) and entertainment (e.g. listen/download music, games, movies). These six applications were categorized based on literature reviewed in earlier section.

The main targets of the respondents were high school and tertiary students in Malaysia who were using mobile phones. These groups of consumers tend to have a good understanding of M-Commerce and its applications, either from peer influence or from academic learning in information technology courses. 500 copies of questionnaires were distributed at major shopping centres in several cities (Kuala Lumpur, Petaling Jaya, Penang, Johor Bahru and Miri) in Malaysia.

Totally, 304 (76%) usable questionnaires were returned. Numbers of literatures have been found to determine the sufficient of sample. Sekaran [39] highlighted that the sample size would be 10 to 20 samples. There was another opinion has suggested that a homogeneous group should exceed 30 participants [40, 41]. Refer to these literatures, the sample size may too

small. Finally, Malhotra [42] suggested that the minimum sampling size for problem solving research is 200 samples. Thus, 304 respondents have been considered as sufficient enough in this study.

RESULTS

Demographics: Out of 500 questionnaires were distributed, only 312 questionnaires were returned. Out of the 376 returned questionnaires, 64 copies were incomplete. However, based on 312 questionnaire returned, only 304 questionnaires were analysed. This is due to the 8 respondents are non Malaysian. Cronbach Alpha values for all applications were higher than 0.646, which shows an acceptable level of reliability [43].

The sample consisted of 154 (50.7%) male and 150 (49.3%) female respondents. Majority of the respondents are between ages of 16-20 (53.9%). This is followed by 21-25 (22.7%), <16 (9.5%), 26-30 (7.2%) and >30 (6.6%). The largest group of the respondents are Chinese (90.1%). The other races are Malay (7.2%), Indian (2%), Eurasian (0.3%) and Sudonese (0.3%) (Table 1).

Descriptive Statistics and Correlation: All mobile phone applications (communication, emergency assistance and entertainment) are important to consumers, except location. This can be referred to the mean score is greater than 2.5. Respondents have rated location-based was less important. However, in terms of correlation, location has a highest correlation with transaction. All factors show a positive correlation, except communication and transaction and communication and location (Table 2). Overall, this analysis of study has supported H1, H1a, H1b, H1c, H1d and H1e. However, only H1f is not supported (Table 3).

Table 1: Demographics

	Frequency	Percent
Gender		
Male	154	50.7
Female	150	49.3
Age		
Less than 16 years old	29	9.5
16-20 years old	164	53.9
21-25 years old	69	22.7
26-30 years old	22	7.2
More than 30 years old	20	6.6
Race		
Malay	22	7.2
Chinese	274	90.1
Indian	6	2.0
Eurasian	1	.3
Sudonese	1	.3

Table 2: Descriptive Statistics and Correlation

	Mean	Std. Deviation	1	2	3	4	5	6
Applications	3.03							
1. Communication	3.99	1.032	1.000	.202**	.195**	.055	-.039	-.048
2. Emergency	3.31	1.267	.202**	1.000	.082	.282**	.360**	.303**
3. Entertainment	3.19	1.192	.195**	.082	1.000	.142*	.111	.193**
4. Content Delivery	2.78	1.119	.055	.282**	.142*	1.000	.522**	.495**
5. Transaction	2.51	1.117	-.039	.360**	.111	.522**	1.000	.615**
6. Location	2.39	1.127	-.048	.303**	.193**	.495**	.615**	1.000

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

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

Table 3: Hypotheses Testing 1

Hypothesis	Decision
H1: Overall mobile phone applications have a significant important in Malaysian consumers' acceptance of M-Commerce.	Supported
H1a: Communication factor has a significant important in Malaysian consumers' acceptance of M-Commerce.	Supported
H1b: Emergency factor has a significant important in Malaysian consumers' acceptance of M-Commerce.	Supported
H1c: Entertainment factor has a significant important in Malaysian consumers' acceptance of M-Commerce.	Supported
H1d: Content delivery has a significant important in Malaysian consumers' acceptance of M-Commerce.	Supported
H1e: Transaction factor has a significant important in Malaysian consumers' acceptance of M-Commerce.	Supported
H1f: Location factor has a significant important in Malaysian consumers' acceptance of M-Commerce.	Not Supported

Table 4: Regression Weights

			Estimate	S.E.	C.R.	P
Communication	–	M-Commerce	.008	.066	.119	.905
Emergency	–	M-Commerce	.541	.077	7.014	***
Entertainment	–	M-Commerce	.230	.076	3.030	.002
Location	–	M-Commerce	.857	.063	13.596	***
Transaction	–	M-Commerce	.898	.062	14.455	***
Content	–	M-Commerce	.727	.064	11.385	***

Table 5: Hypotheses Testing 2

Hypothesis	Decision
H2a: The perceived communication value has a significant effect in Malaysian consumers' acceptance of mobile application.	Not Supported
H2b: The perceived emergency value has a significant effect in Malaysian consumers' acceptance of mobile application.	Supported
H2c: The perceived entertainment value has a significant effect in Malaysian consumers' acceptance of mobile application.	Supported
H2d: The perceived content delivery value has a significant effect in Malaysian consumers' acceptance of mobile application.	Supported
H2e: The perceived transaction value has a significant effect in Malaysian consumers' acceptance of mobile application.	Supported
H2f: The perceived location value has a significant effect in Malaysian consumers' acceptance of mobile application.	Supported

Regression Weights: This study found that five mobile applications (emergency, entertainment, location, transaction and content) have an impact on M-Commerce, except communication. This can be referred to the P value < 0.05 (Table 3). Thus, this study has supported H2b, H2c, H2d, H2e and H2f, except H2a (Table 4).

Testing of Model Fit: The chi-square value (CMIN) is 37.117 and P value is <0.001, which is can be as an accepted value (<2.0). However, The CMIN/DF ratio is 4.124, which is larger than the accepted ration (1-3) (Figure 3 and Table 4). GFI, AGFI [44], NFI, CFI, IFI and TLI coefficients closer to unity indicate a good fit, with acceptable levels of fit being above 0.90. AGFI > 1.0 is

associated with just-identified models and models with almost perfect fit. AGFI < 0 is associated with models with extremely poor fit. The closer the RMR to 0 for a model being tested, the better the model fit [45]. The study shows that the fit indices of GFI (0.962), AGFI (0.912), NFI (0.896), RFI (0.826), IFI (0.919), TLI (0.862) and CFI (0.917) are between 0.80 and 0.90. For RMR and RMSEA, evidence of good fit is considered to be values less than 0.05; values from 0.05 to 0.10 are indicative of moderate fit and values greater than 0.10 are taken to be evidence of a poorly fitting model [46]. The value of RMR is 0.082 and RMSEA is 0.102, which can be categorised as a poorly fit. Finally, due to unfitness of the model, this, we have concluded that H3 is not supported (Table 6).

Figure 3: Path Analysis

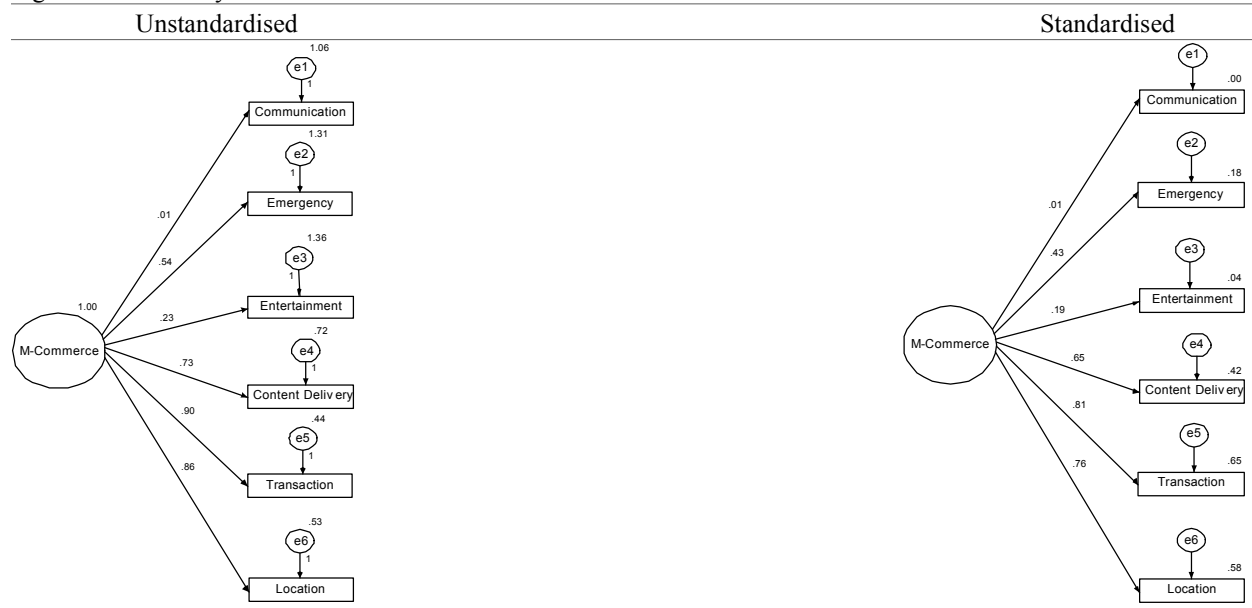


Table 6: Testing of Model Fit

Fit Measure	Value
CMIN	37.117
DF	9.000
P	.000
CMIN/DF	4.124
GFI	.962
AGFI	.912
PGFI	.412
NFI	.896
RFI	.826
IFI	.919
TLI	.862
CFI	.917
RMR	.082
RMSEA	.102

Table 7: Hypothesis Testing 3

Hypothesis	Decision
H3: Overall of mobile phone application model is fit.	Not Support

DISCUSSION

All mobile phone applications especially communication, emergency assistance and entertainment are important to consumers. However, respondents responded that location factor is not one of the important factors in M-Commerce. Communication will be the most important factor of M-commerce application. This can be referred to mean score for communication is 3.99, which is the highest factor compared to other factors. Previous

studies found that communication activities are related to person to person communication [26], advertisement [28, 27] and MMS [27].

In terms of correlation, transaction shows the highest correlation with content (.522) and location (.615). It is no doubt that M-Commerce transactions emergence with Internet E-commerce over wireless access networks, location-based services, ticketing applications, retail shopping and banking [8]. Businesses venturing into the M-commerce marketplace may also find this study useful in gaining insights into consumer adoption behaviour. Overall, most of the factors are significant at the 0.01 or 0.05 level and it is between no correlation and weak positive correlation, weak positive correlation and moderate positive correlation and moderate positive correlation and strong positive correlation. Even communication and content delivery, as well as transaction and entertainment are positive correlation; however, the study found that it is not significant either at 0.05 or 0.01 level. The study also found that communication has a negative correlation with transaction and location.

The second part of the study has proved that five mobile applications (emergency, entertainment, location, transaction and content) have an impact on M-Commerce, except communication. Even, based on the mean score, the respondents have a positive perception on communication, however, surprisingly, in terms of M-Commerce aspect; it has less impact. Even GFI, AGFI, IFI and CFI are exceeding 0.90; however, the overall study

also proved that research model is not a good-fit. This can be referred to chi square is exceeding 2; RMR is exceeding 0.08; and PGFI, NFI, RFI and TLI are less than 0.90. For the chi-square, the ratio of less than 2.0 indicates a good fit [47]. Another three relative indices, GFI, AGFI and TLI were computed to provide a more robust evaluation of model fit [48, 49]. Kline [50] recommends at least four tests, such as chi-square; GFI, NFI or CFI; TLI; and RMR [45]. Refer to Kline [50] recommendation, GFI, NFI and GFI are above 0.90, thus this model still can be considered as a good-fit model.

CONCLUSION

Overall, young consumers' perceptions on mobile applications are positive. The can be referred to the analysis from the respondents' feedbacks. However, only location factor still a less important in mobile application. The mean score is exceeding 2.5 out of 5. The correlation is significant either at 0.01 or 0.05 for most of the factors, except between communication with content delivery, transaction and location; between emergency and entertainment; and entertainment with transaction. However, even perceptions of young consumers are positive, but the overall of the research model is not a perfect model. Thus, further study need to be done and service provides need to find a solution to improve their services for M-Commerce.

As an emerging technology, the success of M-commerce in Malaysia still depends on many other factors, examples government policies, telecommunications infrastructure, marketing strategies of service providers, harmonisation of technical standards and the protection of consumer privacy, trust and privacy in terms of M-Commerce transactions. However, "user acceptance is one of the key fundamentals for development and success of M-Commerce" [51].

Managerial Implications: The first idea of this research on young consumers in Malaysia is based on 30% of the total mobile phone subscribers. Based on market segmentation, it is can be considered as a big portion of the mobile phones subscribers population and it is very important to study this group in terms of their perception on mobile phone applications provided by service provides in Malaysia. In terms of marketers' perspective, the adoption of technology driven innovations and it is very important to understand consumer behaviour in relation to new service development. This study provides an idea on young consumers' perception on mobile phone applications especially related to communication,

emergency, entertainment, content delivery, transaction and location. Marketers should carefully take the needs and considerations of various users into account to provide better services and attract them to M-Commerce.

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