Attitudes of Different Segments of Consumers towards Mobile Advertising

A Study of Mobile Subscribers in an Emerging Market

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Abstract

Global ICT developments are unlikely to alter drastically in the face of the recent economic downturn, owing to the pervasive nature of ICT. The growth rate of mobile phone subscribers is rising exponentially, especially in developing countries. Mobile advertising (m-advertising) is one of the main new revenue growth areas for mobile operators. A set of hypotheses have been devised to examine the attitude of different segments of consumers towards m-advertising. These hypotheses are empirically tested by using multi-group analyses. The empirical results (n=400) identify age, gender and ethnicity moderate factors influencing the acceptance of m-advertising in an emerging market. Using AMOS 16, the survey results collected in early 2011 offer valuable insights for key stakeholders to devise strategies to enhance m-advertising adoption in Malaysia and could provide valuable lessons for other emerging nations.

Introduction

Mobile devices have unlocked new possibilities for underdeveloped communities to increase their reach for information and knowledge instantaneously at a fraction of the cost [1]. Yet, due to the decline in average revenue per user (ARPU) on voice calls, mobile operators have determinedly sought other means of revenue. Empirical evidence backed that m-advertising presents a new revenue channel independent of subscriber ARPU [2]. According to IAB and IHS Screen Digest [3], worldwide expenditure on m-advertisements (i.e. search, display and messaging) in 2011 was US$5.3 billion (see Table 1). Out of the spending, search draws in the highest revenue with US$3.3 billion [3]. Revenue from m-advertising in Asia surpassed North America and Europe.

Table 1: M-advertising Spend by Type (US$ Million) in 2011 [3]

Region	Display	Search	Messaging	Total
Europe	367	900	114	1,380
North America	572	811	295	1,677
Latin America	31	74	83	188
Asia Pacific	491	1,384	41	1,916
Middle East & Africa	44	124	4	172

While earlier studies have offered valuable insight into m-advertising (see [4,5,6,7), nevertheless, the studies on the attitude of different segments of mobile subscribers towards m-advertising in developing countries is still under studied. This study helps to fill in this gap in the literature. The research findings can act as a guideline for the players in the m-advertising industry to aid the industry in targeting the right audience.

Literature Review

There is growing interest in business models based on advertising-funded content attributable to widespread take-up of personalization services [8]. Some of the early m-commerce applications started in Europe and Asia [9]. Nonetheless, there is a scarcity of research on the achievement of diverse mobile services models catering for different consumer segments. For that reason, examining the attitude of different consumer segments towards m-advertising is crucial to the industry.

Bulk of the prior studies has been carried out in developed nations; however, the theoretical models utilized may not be fitting for developing countries which have different ecosystem. The ecosystem in developing economies is in different stage of development. As such, that factors which impact m-advertising adoption in countries in different stages of development may differ. For example, in studying the use of mobile devices, Kshetri and Cheung [10] revealed that the rapid increase in the use of mobile devices in China can be credited to the access to quality telecommunication infrastructure, low-priced mobile services, competitive mobile plans (i.e. prepaid) and increasing disposable income. On the other hand, a similar study conducted in Germany by Fraunholz and Unnithan [11] discovered that the high usage of mobile devices in Germany is attributable to the competitive pricing structure, availability of quality services, as well as greater convergence of mobile communication technologies and the Internet altering the lifestyle of people on the move who could now access information anywhere anytime.

Furthermore, many studies adapted prior theories which predominantly focused on technology use in organizational context to understand end consumers' use of technology. Venkatesh et al. [12] stated that there remains the need to investigate the key factors that influence the context of consumer technology use. It is hence essential to explore systematically the adoption patterns and use decisions as one process for forecasting actual use of m-advertising [13].

After assessing a few technology acceptance models, this study adapts Mobile Phone Technology Acceptance Model (MOPTAM) [14] for the purpose of understanding the behavioral intention of different segments of consumers in adopting m-advertising in an emerging market (see Figure 2). The key determinants (i.e. independent variables) of MOPTAM model are listed as: perceived usefulness (PU), perceived ease of use (PEoU), social influence (SI) and facilitating conditions (FC) (see Table 2). This paper includes moderating factors such as age and gender in addition to ethnic group which is unique in Malaysian context given that individuals residing in Malaysia are of different cultural background. This will shed some light into understanding consumer adoption of m-advertising in a multi-racial developing nation.

Theoretical Framework and Hypotheses

In this study, the dependent variable is the intention to adopt m-advertising. "Behavioral Intention (BI) is the intention to enact behavior" of using m-advertising [15]. BI (i.e. independent

variable) influences Actual Use (AU) [14]. Yi et al. [16] discovered a strong causal link between BI and AU, which implies that consumer intention should strongly influence AU. BI infers AU as observed in a number studies [17,18]. Hence, this study only looks at BI and does not include AU in the theoretical framework.

Table 2: The Four Core Determinants of the Theoretical Framework

Model Determinant	Definitions
Perceived Usefulness (PU)	The degree to which a mobile subscriber believes that using m-advertising will help him or her attain gains in individual performance [19]
Perceived Ease of Use (PEoU)	The individual's perception of the extent of effort needed to use m-advertising services [14]
Social Influence (SI)	The perception of the mobile subscriber that most people who are important to him/ her, think he/ she should or should not use m-advertising services [20]
Facilitating Conditions (FC)	The degree to which a mobile subscriber believes that hard and soft infrastructure exists to support the use of m-advertising [19]

Gender as a moderator

The relationships between the four core constructs and BI will be moderated by gender, age and ethnic group. Study on gender differences reveals that men are often regarded as task-oriented [21]. Therefore men are expected to place more importance on PU, which focuses on task accomplishment. Gender effects may influence m-advertisement patterns due to the different roles played by men and women in society [22]. In a study carried out in Finland, Leppäniemi and Karjaluoto [23] learned that women are more proactive than men in responding to m-advertising campaigns. Nonetheless, Shavitt et al. [24] debated that male mobile subscribers show a more approving attitude toward advertisements in general than female mobile subscribers. In China, He and Lu [25] investigated consumer's perceptions towards SMS-based m-advertising using Unified Theory of Acceptance and Use of Technology (UTAUT) and task-technology fit theory. The findings revealed that the effect of SI was moderated by age, gender and voluntariness of use. The effect was stronger for women, especially younger women. Ergo, this paper hypothesizes:

H_1: Gender moderates the effect of PU on BI, such that the effect will be stronger among men.

H_2: Gender moderates the effect of SI on BI, such that the effect will be stronger among women.

Age as a moderator

Akin to gender, age is theorized to play a moderating role as well. Prior literature suggested that younger individuals may set more importance on extrinsic rewards [26]. In other words, PU is more significant for younger individuals. On the whole, younger consumers are keener towards traditional advertising [24]. As expected, Kaasinen [27] asserted that both the younger and older consumers display a very positive attitude toward mobile advertisements; yet, the older consumers are more cautious. Leppäniemi and Karjaluoto [23] discovered that m-advertising is not simply for teenagers, their results showed that consumers in the age group of 36 to 45 years old have a higher probability to respond to SMS calls-to-action in a television program, take part in SMS sweepstakes and other contests. This study hypothesizes:

H_3: Age moderates the effect of PU on BI, such that the effect will be stronger among younger individuals.

H_4: Age moderates the effect of SI on BI, such that the effect will be stronger among older individuals.

Ethnic group as a moderator

Erumban and Jong [28] looked into the role of cultural factors in ascertaining ICT adoption across nations and their results suggest a strong relation between the two. They deem that adoptions are individual decisions amounted up into group decisions, and such individual decisions are affected by many non-economic factors, related to cultural and psychological characteristics of individuals, organizations, societies and nations. Malaysia is a distinctive ecosystem with three main races. This study will further examine the influence of ethnicity in the adoption of m-advertising. Ergo, this study hypothesizes:

H_5: Ethnicity will moderate the effect of PU on BI

H_6: Ethnicity will moderate the effect of SI on BI

Research Methodology

This study utilizes multi-mode surveys to gather responses to reach a broader coverage. Paper based face-to-face and Web based survey questionnaires are selected as the research instrument for this research. Web-based survey is apt to reach respondents in remote geographical areas. Employing multiple approaches to collect data can increase response rates, lessen non-response error and cut down costs [29]. Each question in the survey embodies a component of the research model. The questions are selected based on their theoretical importance as well as potential relevance to practice.

The research employs a five-point Likert scale throughout the questionnaire for all the statements requiring scaling apart from the demographic questions. Respondents are asked to indicate the extent to which they agree or disagree with a list of statements. The questions were coded as follow: strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5).

Sampling method

Cluster sampling method is applied to obtain a representative sample of the population. The distribution of respondents is based on the percentage split by state out of a total population of 28.33 million residents in 2010. Based on the recommended sample size of 10 cases per variable, the goal of this research is to reach out to 400 respondents. PU, PEoU, and SI were each measured using seven items respectively; FC was measured using 16 items; while BI was measured using five items.

Factor analyses

The study employs Exploratory Factor Analysis (EFA) and oblique rotation (i.e. promax) to ascertain if the data supported a five-factor structure for this sample. The results are then subjected to Confirmatory Factor Analysis (CFA) to gauge how well measured variables represent a smaller number of constructs [30]. Next, modification indices will be carried to identify potential modifications that should be made to the model to improve overall model fit. Apart from improving model fit, it is crucial that the suggested modifications also make theoretical sense.

It is observed that it is infrequent that a model fits well at first. The research will run modification indices using Analysis of Moment Structure (AMOS) 16 to produce the expected reduction in the overall model fit chi-square for each possible path that should be added to or removed from the model.

Multi-group analysis

The main goal of the study is to examine the impact of the moderating factors such as age, gender and ethnicity on the relationships of the factors influencing BI in adopting m-advertising. Multi-group analysis (also known as multiple sample analysis) will be used. This analysis is an extension from the single group specification and it is a practice of whether the measurement structure of the items in the model functions the same way across several groups. This will be carried out by comparing the structural weights for the groups. Multi-group analysis comprises of a multi-step approach to determine the baseline fit of the measurement model in each group using Structural Equation Modeling (SEM). The invariance or equality across the groups is examined for factor loadings, factor variances/ covariances and structural coefficients. The results will show if a factor influencing the decision to adopt m-advertising is significant in one group and not the other or if it affects one group much more than the other group of mobile subscribers.

Results and Discussion

In this study, there were 234 women (58.5 percent) and 166 men (41.5 percent). The sample is represented by 44.8 percent respondents between the ages of 26 to 35, 38.5 percent between the ages of 17 to 25, 11.8 percent between the ages of 36 to 45, as well as 3.2 percent between the ages of 46 to 55, and 1.8 percent above 55 years' old. As the survey is carried out in urban areas, the concentration of youth is greater. However, the mobile subscribers between the ages of 17 to 35 represent the biggest group of mobile subscribers in Malaysia. In this sample, 69.3 percent of the samples are Non-Bumiputra (i.e. Non-natives) and 30.8 percent of the samples are Bumiputras (i.e. Natives). Bumiputra is a Malay terminology commonly used in Malaysia, encompassing indigenous people of the Malay Archipelago.

Scale reliability

The data were first assessed for reliability using Cronbach's alpha. Internal consistency values of the measurement items were tested before entering into structural analysis. The results show that the sample is reliable for further data analysis (see Table 3). The composite reliability is also adequate for all the indicators included.

Table 3: Cronbach's Alpha

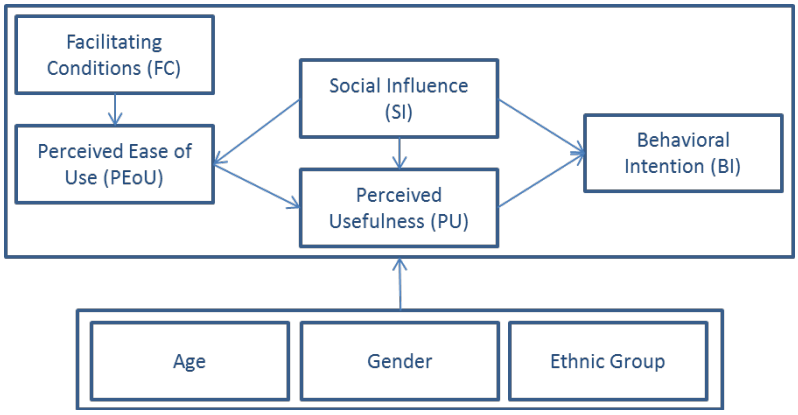
Constructs	Cronbach's Alpha	Number of Items
Behavioral Intention (BI)	0.892	5
Perceived Usefulness (PU)	0.848	7
Perceived Ease of Use (PEoU)	0.864	7
Social Influence (SI)	0.869	7
Facilitating Conditions (FC)	0.914	16

Cronbach's alpha in excess of 0.9 for FC implies possible redundancy in the questionnaire [31]. Factor analysis will be carried out to verify if data reduction is needed. Largely, all five constructs were so highly internally consistent, that there was the probability that some items in each construct are redundant.

Exploratory and confirmatory factory analyses

EFA with principal axis factoring (PAF) and oblique rotation (i.e. promax) is run using SPSS 16 and the Kaiser-Meyer-Oklin (KMO) value was 0.937, beyond the recommended value of 0.6 [32]. The Barlett's Test of Sphericity [33] shows statistical significance to indicate that factor analysis can be undertaken. The observed significance level is 0.000. It is thus deduced that the strength of the relationship among variables is strong.

Figure 2: Final Theoretical Model



Review of the pattern matrix disclosed the presence of many coefficients of 0.4 and above. It is also observed that none of the coefficients above 0.4 loads on seven variables and these variables will be taken off from the analysis. The 35 items of factors affecting adoption of m-advertising are then subjected to CFA. After the final model has been determined, the directions of the relationships between the constructs are assessed. Each direction of the path has been examined and the results show that the following modified model (x^2:*df*=2.724:1) has the best Goodness of Fit (GOF) measures compared to other combinations (see Figure 2).

Multi-group Analysis

This section examines the moderating effect of constructs (i.e. age, gender and ethnicity) on the relationship between two variables using multiple group analysis in AMOS. It has been proposed that consumers' demographics are expected to have a weighty influence on how mobile advertisements are processed [4].

Table 4: Testing for Age as Moderator

Model Characteristic	Unconstrained Model	Constrained Model
x^2	1438.9	1517.9
df	807	859
CFI	0.875	0.87
RMSEA	0.44	0.44
$P_{FC,PEoU}$	0.492 (17 to 25)*	0.3 (Combined)*
	0.182 (26 to 35)	
	0.279 (Above 35)*	
$P_{SI,PEoU}$	0.558 (17 to 25)*	0.71 (Combined)*

	0.729 (26 to 35)*	
	0.888 (Above 35)*	
$P_{PEoU,PU}$	0.232 (17 to 25)*	0.3 (Combined)*
	0.191 (26 to 35)	
	0.763 (Above 35)*	
$P_{SI,PU}$	0.431 (17 to 25)*	0.45 (Combined)*
	0.486 (26 to 35)*	
	0.053 (Above 35)	
$P_{SI,BI}$	0.324 (17 to 25)*	0.33 (Combined)*
	0.476 (26 to 35)*	
	0.308 (Above 35)*	
$P_{PU,BI}$	0.487 (17 to 25)*	0.49 (Combined)*
	0.327 (26 to 35)*	
	0.591 (Above 35)*	

* Significant at 0.05 level

Both models show acceptable fit indices (CFI and RMSEA) indicating their overall acceptability. The chi-square difference between models is 79 with 52 degrees of freedom. This is significant ($p < 0.001$), showing that constraining the model produces worse fit. Hence, the unconstrained model in which the relationships are freely estimated in the three groups is supported. This result suggests that age does moderate the selected relationships.

Looking at the standardized parameter estimates for the unconstrained model, FC→PEoU relationship is significant in both the younger respondents (17 to 25 years' old) and the older respondents (above 35 years' old); however, this is not the case for the young adults (26 to 35 years' old). The relationship is greater for 17 to 25 years' old, with a standardized estimate of 0.492, compared to a standardized estimate of 0.279 for participants above 35 years' old. Ergo, it appears that the impact of FC on PEoU is higher for the younger respondents. The SI→PEoU relationship is significant in all three age groups. The relationship is greater for respondents above the age of 35 (0.888), compared to 26 to 35 years' old (0.729) and 17 to 25 years' old (0.558). This result shows that the influence of SI on PEoU is higher for older adults. Looking at the standardized parameter estimates for the unconstrained model, PEoU→PU relationship is significant in both the younger respondents (17 to 25 years' old) and the older respondents (above 35 years' old), but not the young adults (26 to 35 years' old). The relationship is greater for respondents above 35 years' old, with a standardized estimate of 0.763, as compared to a standardized estimate of 0.232 for 17 to 25 years' old. Hence, the PEoU of m-advertising strongly influences older adults to perceive the mobile advertisement as being useful to them.

Table 5: Testing for Gender and Ethnic Group as Moderator

Gender		
Model Characteristic	Unconstrained Model	Constrained Model
x^2	1062.936	1091.684
df	538	564
CFI	0.894	0.893
RMSEA	0.05	0.048

Ethnicity		
Model Characteristic	Unconstrained Model	Constrained Model
x^2	1121.233	1148.499
df	538	564
CFI	0.884	0.884
RMSEA	0.052	0.051

$P_{FC,PEoU}$	0.264 (Female)* 0.301 (Male)*	0.3 (Combined)*
$P_{SI,PEoU}$	0.735 (Female)* 0.681 (Male)*	0.71 (Combined)*
$P_{PEoU,PU}$	0.529 (Female)* 0.204 (Male)	0.3 (Combined)*
$P_{SI.PU}$	0.199 (Female) 0.589 (Male)*	0.45 (Combined)*
$P_{SI,BI}$	0.363 (Female)* 0.278 (Male)*	0.33 (Combined)*
$P_{PU,BI}$	0.497 (Female)* 0.509 (Male)*	0.49 (Combined)*

* Significant at 0.05 level

$P_{FC,PEoU}$	0.273 (Bumiputra)* 0.342 (Non-Bumiputra)*	0.3 (Combined)*
$P_{SI,PEoU}$	0.727 (Bumiputra)* 0.719 (Non-Bumiputra)*	0.71 (Combined)*
$P_{PEoU,PU}$	0.324 (Bumiputra) 0.293 (Non-Bumiputra)*	0.3 (Combined)*
$P_{SI.PU}$	0.314 (Bumiputra)* 0.487 (Non-Bumiputra)*	0.45 (Combined)*
$P_{SI,BI}$	0.471 (Bumiputra)* 0.251 (Non-Bumiputra)*	0.33 (Combined)*
$P_{PU,BI}$	0.439 (Bumiputra)* 0.542 (Non-Bumiputra)*	0.49 (Combined)*

* Significant at 0.05 level

Both models show acceptable fit indices (CFI and RMSEA) demonstrating their overall acceptability. The chi-square difference between models is 28.75 with 26 degree of freedom. This is significant ($p < 0.001$), signifying that the constrained model produces worse fit. This result suggests that gender does moderate certain relationships in the model.

Looking at the standardized parameter estimate for the unconstrained results, it is discovered that the PEoU→PU relationship is only significant in women. This suggests that PEoU of m-advertising affects PU of the service for women only. The easier to use the service, the more women perceive m-advertising as being useful to them. However, looking at the standardized parameter estimate for the unconstrained results, it is revealed that the SI→PU relationship is only significant in men. The SI→BI relationship is greater for women, with a standardized estimate of 0.363, as compared to a standardized estimate of 0.278 for men. This finding is supported by Nysveen et al. [34] who suggest that females seem to prefer to use mobile service for social interaction than males.

As for testing for ethnic group as moderator, both models show acceptable fit indices (CFI and RMSEA) signifying their overall acceptability. The chi-square difference between models is 28.75 with 26 degree of freedom. This is significant ($p < 0.001$), indicating that the constrained model produces worse fit. This result proposes that ethnicity does moderate particular relationships in the model. Looking at the standardized parameter estimates for the unconstrained model, FC→PEoU relationship is significant in both groups of respondents (Non-bumiputra and Bumiputra). The relationship is stronger for Non-bumiputra, with a standardized estimate of 0.342, as compared to a standardized estimate of 0.273 for Bumiputra respondents. The SI→PEoU relationship is greater for Bumiputra, with a standardized estimate of 0.727, as compared to a standardized estimate of 0.719 for Non-bumiputra. This means that Bumiputra respondents are marginally more dependent on peers when it comes to ease of using m-advertising.

In addition, looking at the standardized parameter estimate for the unconstrained results, it is discovered that the PEoU→PU relationship is only significant in Non-bumiputra. The SI→BI relationship is greater for Bumiputra, with a standardized estimate of 0.471, as contrasted to a standardized estimate of 0.251 for Non-bumiputra. Similarly, Bumiputra respondents are more reliant on subjective norm when it comes to intention to adopt m-advertising. Lastly, PU→BI relationship is significant in both groups of respondents. The relationship is stronger for Non-bumiputra (0.542) compared to Bumiputra (0.439).

Conclusions

Emerging countries have overtaken the developed nations in 2008 in the percentage contribution to the global GDP. The high potential for rapid growth allows them to entice investors notwithstanding with a certain level of risk. Emerging economies are the main growth opportunity for the mobile industry. Therefore, these nations are major importers of telecommunication devices from developed nations. In emerging countries, there is prospect to realize incremental revenues by delivering m-advertising services that take advantage on growing mobile phone penetration. Mobile phone users in the developing economies have already established inclination to use their mobile phones to access value-added services. Delivering opportune and useful information to address basic wants among new mobile subscribers is going to be an important source of growth for the mobile communication industry and for the economy.

This study has attested the validity of the MOPTAM for research in the area of m-advertising. The findings have important implications for both policy-makers, industry and researchers. Practitioners may use the results to devise targeted marketing programs to improve adoption of m-advertising. For instance, the findings reveal that the young adults (aged 26 to 35) perceive the opinion of an influential referent to be crucial in perceiving the usefulness of m-advertising. The important implication of this study is that advertisers should be aware of different groups having varying degrees of affinity to mobile advertisement. As such, specific strategies should be in place for targeted groups to adopt this mode of advertising.

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