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Consumers' behavioral intentions to use mobile data services in Malaysia

TM Faziharudean[1]* and Tan Li-Ly[2]

[1]Faculty of Business and Accountancy, University of Malaya, Kuala Lumpur, Malaysia.
[2]Graduate School of Business, University of Malaya, Kuala Lumpur, Malaysia.

Mobile data services have gained its popularity among mobile phone users even throughout the world, the voice calls revenue decreases and the mobile phone industry has been experiencing market saturation. With limited research pertaining to what are the factors that affect customers' behavioral intention to use mobile data services, this study attempts to identify these factors and the extent to which they have affected customers' behavioral intention to use mobile data services. A questionnaire survey was conducted in 2008 at Klang Valley, Malaysia. The samples used were mainly from the working population and graduate students. There were 404 valid respondents for the survey. The findings show that the factors perceived usefulness, perceived enjoyment, perceived mobility, social influence and perceived ease of use (in descending order of importance) had significant positive influences on consumers' usage intentions for mobile data services. However, media influence and perceived monetary value were found to have no significant impact. The result from this study on technology adoption provides an insight perspective to product developers and marketers on consumers' behavioral intentions to use the new emerging services that might replace the importance of voice data in the near future.

Key words: Mobile data services, m-commerce, mobile telephone.

INTRODUCTION

The usage of mobile phone has diversified from only to make and receiving voice calls to increasingly being used for mobile data services, such as SMS or MMS. As many countries throughout the world have experienced saturation in its mobile phone market (Business Monitor International, BMI, 2008) the mobile operators has intensified their marketing tactics by offering a broader range of products and loyalty programs that are not limited to voice calls, but by aggressively promoting its mobile data services. However, there are limited studies investigating the perceived value of mobile data services and how the value impacts consumers' adoption and usage decisions. Among the study on the potential consumers' intentions to adopt mobile data services is from Hong and Tam's (2006) study, which identified

besides the dominant factor, perceived usefulness, other factors such as perceived enjoyment, perceived monetary value and social influence have strong effects on adoption intention. The effects of perceived services availability on perceived usefulness and perceived ease of use were also found to be significant. This paper would extend the study by Hong and Tam (2006) and other past studies on the adoption of new technologies. By identifying the factors that would influence the usage behavior of consumers, it will contribute to the understanding of what can be done to meet consumers' need in using mobile data services.

BACKGROUND OF MOBILE SERVICES IN MALAYSIA

IDC Report (2008a) showed that in the year 2007, the total number of mobile subscribers in Malaysia was 23.3 million, an increase of 20% compared to the year 2006. The mobile phone market remained attractive in Malaysia

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*Corresponding author. E-mail: deanfeissal@um.edu.my. Tel: +603-21673008. Fax: +603-26173050.

with total revenue of RM 14.6 billion (USD$4.4 billion) in 2007, an increase of 16.5% compared with the previous year. The total non-voice revenue was RM 3.2 billion (USD$1.0 billion), which contributed to 22.1% of total revenue in 2007. In a year-on-year revenue comparison, SMS grew by 18.6%, MMS by 43.6%, and other data services grew by 51.4% (IDC Report, 2008b). 67.1% of the total non-voice revenue segment in 2007 came from SMS (USD$0.7 billion). As shown in Table 1, Mobile internet is leading and contributes the highest advanced data services revenue in Malaysia. 'Personalization' is refers to content download services such as ring tones; and 'others' refers to revenue generated from mobile device services (for example, Blackberry) and value added services, that contributed more than 20% of the revenue. The increasing roles of mobile data services in Malaysia based on the facts presented above has raised to the following research questions to be addressed in this study:

1. What are the factors that drive consumers' intentions to use mobile data services?
2. To what extent do these factors affect consumers' intentions to use the mobile data services?

A survey by the Malaysian Communications and Multimedia Commission (MCMC) indicated that the Klang Valley (comprising of Selangor and Kuala Lumpur) has the largest share of the subscribers' base (30.7%) in 2007 (Table 2). Moreover, Kuala Lumpur achieved the highest mobile subscribers' penetration rate. Thus, the Klang Valley anticipated being leaders in the adoption of mobile data services and an appropriate choice for the study of consumers' behavioral intentions to use mobile data services.

LITERATURE REVIEW

Mobile data services can be generally classified into four categories: Communication services, information content services, entertainment services and commercial transaction services (International Telecommunication Union (ITU), 2002; Sadeh, 2002). Mobile communication services are the most extensively used form of mobile data services including SMS, MMS, e-mails, and mobile chatting (ITU, 2002). Information content services deliver information content such as news headlines or location-based information. The mobile entertainment services according to Hong et al. (2008) include ringtones and mobile music. Commercial transaction services include the usage of mobile phones to conduct financial transactions and shopping for goods and services.

Models of technology adoption

There are four commonly accepted models of technology adoption:

Table 1. The Composition of wireless telecom's share in Malaysia for Year 2007 (US$ million).

Item	US$ million	Percentage
Mobile gaming	3.4	3.4 %
Mobile Internet	36.6	36.9 %
Mobile music	0.2	0.2 %
Mobile television	2.4	2.4 %
Personalization	21.4	21.6 %
Others	35.1	35.4 %

Source: Ericsson analysis, Pricewaterhouse Coopers, 2008; Ovum Q2, 2008.

Table 2. Cellular phone penetration rate per 100 inhabitants by state.

Negeri	2004	2005	2006	2007
Johor	48.8	63.8	70.0	71.4
Kedah	39.6	45.7	60.2	58.8
Kelantan	27.3	35.2	51.5	46.1
Melaka	56.1	60.3	87.6	85.5
Negeri Sembilan	48.3	59.0	75.6	73.0
Pahang	32.1	45.2	56.6	59.0
Pulau Pinang	53.6	72.2	72.6	73.1
Perak	40.9	46.3	57.1	57.5
Perlis	35.5	51.0	70.6	58.2
Selangor	60.7	74.8	76.3	76.1
Terenganu	28.3	39.5	62.4	59.2
Sabah	23.6	31.4	36.9	39.6
Sarawak	31.7	36.6	51.5	43.3
W.P. Kuala Lumpur	69.7	89.3	93.1	91.4
State	2004	2005	2006	2007

Source:Malaysian Communications and Multimedia Commission, 2007.

Theory of reasoned action (TRA)

The TRA by Fishbein and Ajzen (1975) explain general concepts of adoption behavior: behavioral attitude, subjective norm, intention to use and actual usage.

Technology acceptance model (TAM)

TAM by Davis (1989) revealed that two powerful factors that influence the adoption of technology are: perceived usefulness and perceived ease of use. As summarized by Phuangthong and Malisawan (2005), the TAM has been applied to many different end-user technologies such as email (Davis, 1989), word processors (Davis et al., 1989), groupware (Taylor and Todd, 1995), spread-sheets (Mathieson, 1991) and the world wide web.

Theory of planned behavior (TPB)

TPB extended TRA by introducing the construct of perceived behavioral control (Venkatesh et al., 2003), and good in explaining individual acceptance and usage of many different technologies (Harrison et al., 1997; Mathieson, 1991; Taylor and Todd, 1995). However, the review by Taylor and Todd (2001) reported that it did not provide a complete explanation of usage intention as compared TAM.

Decomposed theory of planned behavior (DTPB)

DTPB is identical to TPB when predicting intention (Venkatesh et al., 2003), but similar to TAM, it decomposed attitude, subjective norm and perceived behavioral control into its underlying belief structure within technology adoption contexts. Therefore, it identifies specific salient beliefs that may influence ICT usage (Taylor and Todd, 2001). It is thus possible to provide a more complete explanation of usage as it incorporates additional factors that are not present in TAM, but have been shown to be important determinants of behavior (Ajzen, 1991).

The technology adoption studies related to mobile data services

Relevant previous studies on the technology adoption related to mobile data services are described in the following sections.

The adoption of multipurpose information application

The result of the study by Hong and Tam (2006) showed that the determinants of adoption decisions are not only different from those made in the workplace, but also depend on the nature of the target technology and its usage context. It identified strong effects of perceived usefulness, perceived enjoyment, perceived monetary value and social influence. In subsequent research, Hong et al. (2008) attempted to identify and empirically explained the factors that drove consumers' continued usage intention for mobile data services in Hong Kong based on the DTPB model. The study discovered that attitude, social influence, media influence, perceived mobility and perceived monetary value influenced consumers' intention to continue using the mobile data services, but perceived ease of use, perceived usefulness and perceived enjoyment influence attitude towards continued usage of mobile data services.

The consumers' acceptance of mobile data services

In DTPB, the attitudinal belief category typically consists of behavioral beliefs based on the likely consequences of the behavior (Venkatesh and Brown, 2001), that establishes the attitude towards using a technology, which in turn affects usage intention.

Attitudinal beliefs: Besides perceived usefulness and perceived ease of use, perceived enjoyment or fun is an important factor determining technology adoption (Bruner and Kumar, 2005; Davis et al., 1992). Hong et al. (2008) also expanded on Ajzen's theory of planned behavior (Ajzen 1991; 2002) that theorized having a more positive attitude towards a behavior, leads to a greater intention to carry out that behavior. The attitude in this context is based on the consumers' direct experience in assessing mobile data services with ease of use (Fazio and Zanna, 1981). Hence, the hypotheses for attitudinal beliefs were:
(a) Perceived usefulness, perceived ease of use and perceived enjoyment have positive influence on consumers' attitude towards continued usage of mobile data services; and (b) consumers' attitude has a positive influence on their intention to continue usage of mobile data services.

Normative beliefs: The social influence from consumers' peers and superiors concerning technology use also important antecedent of consumer behavior in information technology adoption contexts (Mathieson, 1991; Taylor and Todd, 1995; Venkatesh et al., 2003). The hypotheses adopted by Hong et al. (2008) for normative beliefs were: Social and media influence have positive influences on consumers' intention to continue usage of mobile data services.

Perceived behavioral control: Hong et al. (2008) included the notion of perceived behavioral control associated with an external constraint in the mobile data services environment for its adoption. Perceived mobility is the extent to which mobile data services are perceived as being able to provide pervasive and timely connections. The hypothesis derived was: Perceived mobility has a positive influence on consumers' intention to continue usage of mobile data services.

Perceived monetary value: Finally, Hong et al. (2008) proposed perceived monetary value in the construct that may affect mobile data services' usage behavior. Most consumers cognitively encode prices as expensive or cheap (Jacoby and Olson, 1977). Consumer perception of monetary value of goods or services is the effect of the mental accounting process of their perceptions of quality and sacrifice (Dodds et al., 1991, Suri et al., 2003). It is perceived positive when perceptions of quality are greater than sacrifice (Monroe, 1990) and this affects consumers' intention to use a product (Cronin et al., 2000; Dodds et al., 1991; Zeithaml, 1998). The hypothesis derived was: Perceived monetary value from the use of mobile data services has a positive influence on consumers' intention to continue usage of mobile data
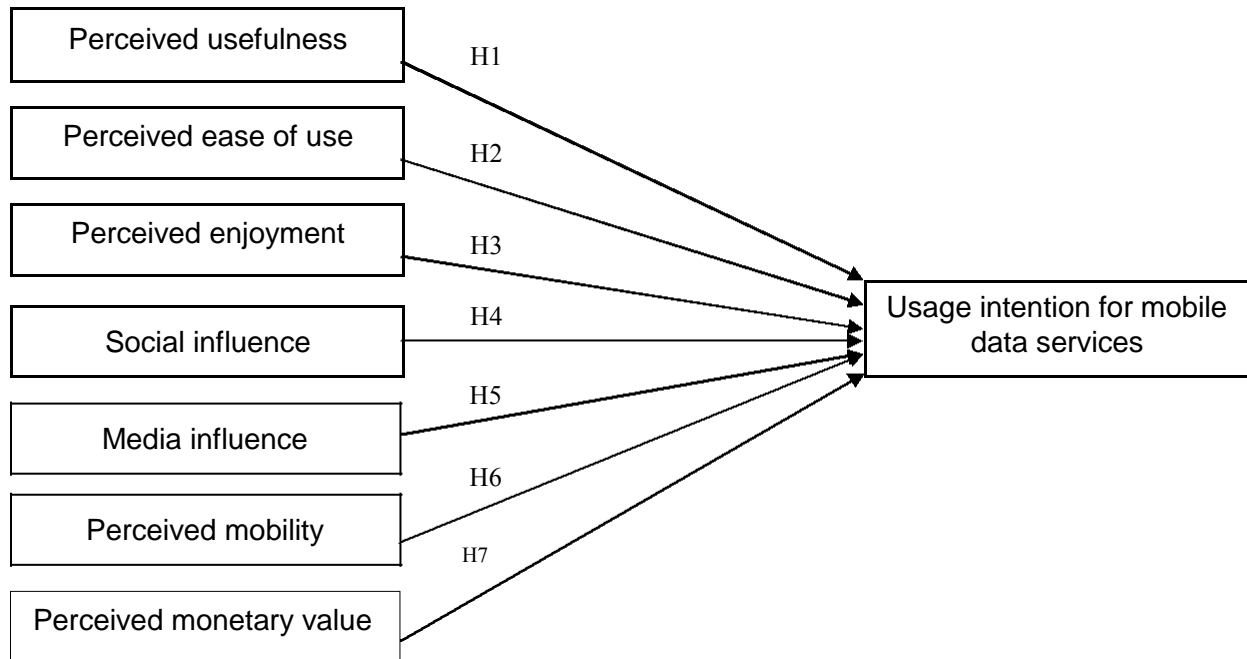
Figure 1. Theoretical framework and hypotheses.

services.

Predicting consumer intention to use mobile commerce

The study by Lin and Wang (2005) proposed a model to explain and predict consumer intention to use m-commerce systems which integrates TAM with both a trust construct (perceived credibility) and TPB's perceived behavioral control construct (for example, perceived self-efficacy and perceived financial resources). Attitude construct was eliminated in an attempt to simplify the model. The findings of the study strongly support the appropriateness of using the integrated model to understand the acceptance of m-commerce by individuals. It has a greater ability to predict and explain the behavioral intention of users to use an information system, with only five constructs.

The Studies on mobile data services in the Malaysian context

In Malaysia, Wong and Hiew (2005a) conducted a study on drivers and barriers that could be used to encourage mass market adoption of mobile entertainment services. The results showed that perceived benefit has the significant contribution on the adoption of mobile enter-tainment in Malaysia. Hence, Wong and Hiew (2005b) suggested that the adoption of mobile entertainment in Malaysia is driven by the attributes of mobile services,

which include: Ubiquity, personalization, localization, timeliness, network stability and mobility. Their further study on the correlation between factors that affect the adoption of mobile entertainment services in Malaysia (specifically the perceived benefit; issues pertaining to pricing, product and technological standardization; influence from peers, community and media; and privacy and security) showed that there is a strong positive correlation between all the variables, with pricing issues/ perceived benefit showing the strongest relationship.

RESEARCH METHODOLOGY

Development of theoretical framework and hypotheses

For this study, the theoretical framework and hypotheses were adapted from Lin and Wang (2005) and Hong et al. (2008) as discussed in the literature review (Figure 1). As this study was conducted in Malaysia where the usage of mobile data services is in its growing stage, the consumers' usage intention for mobile data services was used instead of their continued usage intention, as what had been studied by Hong et al. (2008) in Hong Kong.
The hypotheses for this study are as follow:

H1: Perceived usefulness has a positive influence on consumers' usage intention for mobile data services.
H2: Perceived ease of use has a positive influence on consumers' usage intention for mobile data services.
H3: Perceived enjoyment has a positive influence on consumers' usage intention for mobile data services.
H4: Social influence has a positive influence on consumers' usage intention for mobile data services.
H5: Media influence has a positive influence on consumers' usage intention for mobile data services.

H6: Perceived mobility has a positive influence on consumers' usage intention for mobile data services.

H7: Perceived monetary value from the use of mobile data services has a positive influence on consumers' usage intention for mobile data services.

Measurement

A self-administered questionnaire adapted from Hong et al. (2008) was used to collect the needed data using seven-point Likert-type scales. Table 3 presents a summary of the description of measures adapted for this study.

Sampling design and data collection

The data collection was conducted in Klang Valley that has the largest share of the mobile phone subscribers' base in Malaysia. The respondents were selected using the convenience sampling technique with questionnaires distributed throughout the Klang Valley. Mobile data services in this study are defined as mobile services that are used for entertainment and information purpose only.

As the objective of this study was to examine the factors that may affect consumers' intention to use mobile data services in personal usage contexts, only those who were using mobile data services for personal purposes and whose bills were paid by either themselves or their parents/family were included in the analysis. Respondents who are economically dependent on their family (for example students and elderly people) were included because they are a significant part of the mobile data services' consumer population. Respondents were also asked to identify the mobile data services they had frequently used.

DATA ANALYSIS AND RESULTS

The survey received a total of 440 respondents of which 404 of them (92%) met the eligibility criteria and were therefore, included for further analysis. This study used the statistical package for the social science (SPSS) for Windows 16.0.

Frequency distribution and respondent profile

The demographic distributions of the 404 valid respondents are shown in Table 4. More than half of respondents (69%) stated they intended to use mobile data services "entirely" or "mainly" for personal use. Gender distribution is quite balanced. The majority of respondents in this study were ethnic Chinese (71%), reflecting the large Chinese population in urban area in Malaysia. As for the age group, 71% of respondents are below 31 years old, and 72% of respondents are single. The respondents also came from different working backgrounds with the majority being students (46%), and report a monthly income of below RM 2,001 (49%). Maxis users dominated the sample of respondents. Postpaid mobile subscribers in this study are slightly higher in number than prepaid subscribers.

Distribution of frequent users of mobile data services

It was found that browsing the internet to search for information is the most popular service (57%), followed by content download (43%), updating information (35%)and accessing social sites, such as Facebook and Friendster (28%). Female respondents are more inclined than males to download ring tones, music, games, graphics, and movie content, whilst males demonstrate higher levels of interest in obtaining updates for latest news, sports, stock market, traffic and weather.

Measures of central tendencies and dispersion

All items in this research questionnaire had Skewness and Kurtosis with values between - 3 and +3 which is satisfactory for social science studies (Coakes and Steed, 2003). The significance value of 0.000 suggests violation of the assumption of normality ($P \leq 0.05$). However, Pallant (2007) argued that it is acceptable with large sample size. Therefore, the data collected are considered acceptable for analysis.

Factor analysis on variables

Exploratory factor analysis was used in this study. As the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) value is 0.926 is greater than 0.6 (Pallant, 2007), and Bartlett's Test of Sphericity value is significant (p = 0.000), the data set is suitable for factor analysis. Kaiser's criterion method was adopted to determine the number of factors or components, and those with an Eigen value of 1 or more were retained (Pallant, 2007). 7 components record Eigen values above 1. Together they explained 83.5% of the variance. The result from the study also indicated that all items have communality values above 0.3 and thus qualified for further analysis.

Reliability analysis

The Cronbach's Alpha results, which are presented in Table 5, show values all above 0.8, suggesting very good internal consistency reliability (Pallant, 2007). The value for reliability of scale for overall variables is 0.87, showing good internal consistency reliability for the scale with the samples. As a result, all variables are retained for the subsequent analysis.

Multivariate analysis: Multiple regression analysis

As shown in Table 6, the correlation between the model independent variables and dependent variable (Behavioral intention) is greater than 0.3 and the bivariate

Table 3. Description of measures adapted for this study.

Variables	Description of measures	Reference
Perceived usefulness Hong et al. (2008)	I would find "mobile data services" to be useful in my daily life.	Davis et al. (1989)
	Using "mobile data services" would help me accomplish things more quickly.	Davis et al. (1989)
	Using "mobile data Services" would increase my productivity.	Davis et al. (1989)
	Using "mobile data services" would help me perform many things more conveniently	Davis et al. (1989)
Perceived ease of use Hong et al. (2008)	I expect that learning how to use "Mobile Data Services" would be easy for me.	Davis et al. (1989)
	I expect that my interaction with "mobile data services" would be clear and understandable.	Davis et al. (1989)
	I would find "mobile data services" to be easy to use.	Davis et al. (1989)
	I expect that it would be easy for me to become skillful at using "Mobile Data Services".	Davis et al. (1989)
Perceived enjoyment Hong et al. (2008)	I expect that using "mobile data services" would be enjoyable.	Davis et al (1992)
	I expect that using "mobile data services" would be pleasurable.	Davis et al (1992)
	I expect to have fun using "mobile data services".	Davis et al (1992)
	I expect that using "mobile data services" would be interesting.	Davis et al (1992)
Social Influence (example, peers, family members, superiors and colleagues) Hong et al. (2008)	People who are important to me would think that I should use "mobile data services".	Mathieson (1991)
	People who influence my behavior would think that I should use "mobile data services".	Mathieson (1991)
	People whose opinions I value would prefer that I use "mobile data services".	Mathieson (1991)
Media Influence (example, television, radio, newspapers and magazines) Hong et al. (2008)	The media and advertising consistently recommend me to use "mobile data services".	Nysteen et al. (2005)
	The media and advertising suggest that using "mobile data services" is a good idea.	Nysteen et al. (2005)
	The media is full of reports, articles, and advertisements suggesting "mobile data services" to be worth using.	Hong et al. (2008)
Perceived monetary value Hong et al. (2008)	I expect that "mobile data services" would be reasonably cheap.	Dodds et al. (1991)
	"Mobile data services" would offer a good value for money.	Dodds et al. (1991)
	I believe that at the current price, "mobile data services" would provide a good value.	Dodds et al. (1991)
Perceived mobility Hong et al. (2008)	I expect that I would be able to use "mobile data services" at anytime, and anywhere.	Venkatesh (2000)
	I would find "Mobile Data Services" to be easily accessible and portable.	Venkatesh (2000)
	I expect that "mobile data services" would be available for use whenever I need it.	Venkatesh (2000)
	In general, I expect that I would have control over using "mobile data services" anytime and anywhere.	Hong et al. (2008)
Behavioral intention Hong et al. (2008)	I intend to use "mobile data services" in the future.	Davis et al. (1989)
	I expect that I would use "mobile data services" in the future. I expect to use "mobile data services" frequently in the future.	Davis et al. (1989)
		Davis et al. (1989)

Table 4. Demographic distribution of respondents.

Categories	Frequencies (N=404)	Percentage (%)
Intend usage purpose for mobile data services		
Entirely personal	129	31.9
Mainly personal	150	37.1
Half Personal, half business	114	28.2
Mainly business	11	2.8
Who will pay the usage bills for mobile data services		
Myself	301	74.5
Parents or Family	103	25.5
Gender		
Male	177	43.8
Female	227	56.2
Age		
20 years old and below	138	34.2
21-30 years old	147	36.4
31-40 years old	74	18.3
41-50 years old	27	6.7
Ethnic group	18	4.4
Malay	57	14.1
Chinese	286	70.8
Indian	33	8.2
Other	28	6.9
Marital status		
Single	291	72.0
Married without children	22	5.5
Married with children	90	22.3
Divorced/separated/widow	1	0.2
Education		
Primary school	3	0.8
Secondary school	45	11.1
Certificate/diploma/college	95	23.5
Bachelor degree	198	49.0
Post graduate/professional cert.	63	15.6
Occupation		
Administrative/clerical	14	3.5
Executive/senior executive	66	16.3
Assistant manager/manager	49	12.1
Senior manager and above	14	3.5
Professional	43	10.6
Full-time student	187	46.3
Currently not working/retired	13	3.2
Other	18	4.5

Table 4. Continued

Monthly income		
RM 2,000 and below	197	48.7
RM 2,000 – RM 4,000	101	25.0
RM 4,001 – RM 6,000	63	15.6
RM 6,001 – RM 8,000	25	6.2
RM 8,001 and above	18	4.5
Telecom company		
Maxis	274	67.8
Digi	86	21.3
Celcom	42	10.4
U Mobile	2	0.5
Mobile plan		
Postpaid	220	54.5
Prepaid	184	45.5

Table 5. Cronbach's Alpha for each variable.

Variables	No of measurement items	Cronbach's Alpha
Perceived usefulness	4	0.932
Perceived ease of use	4	0.914
Perceived enjoyment	4	0.952
Social influence	3	0.936
Media influence	3	0.904
Perceived monetary value	3	0.833
Perceived mobility	4	0.926
Behavioral intention	3	0.950

Table 6. Correlations.

	Behavioral intention	Perceived usefulness	Perceived ease of use	Perceived enjoyment	Social influence	Media influence	Perceived monetary value
Perceived usefulness	0.648						
Perceived ease of use	0.589	0.509					
Perceived enjoyment	0.642	0.605	0.657				
Social influence	0.522	0.583	0.363	0.434			
Media influence	0.425	0.393	0.383	0.392	0.405		
Perceived monetary value	0.419	0.376	0.444	0.391	0.323	0.347	
Perceived mobility	0.513	0.391	0.555	0.469	0.266	0.418	0.515

Note: Correlation is significant at the $P \geq 0.01$ level (2-tailed).

correlation between independent variables is less than 0.7. This result illustrates that the assumption of multi-collinearity has not been violated. Therefore, all variables are retained for multiple regression analysis. As part of the multiple regression procedure, the "collinearity diagnostics" were also performed to detect any multicollinearity problems. Pallant (2007) quoted the commonly used cut-off points for determining the presence of multicollinearity: Tolerance value <0.10 or VIF value > 10). Table 7 shows tolerance values all

Table 7. Multi regression analysis for the prediction of consumer's behavioral intention to use the mobile data services.

	Unstandardized coefficients		Standardized coefficients	T	Sig.	Collinearity statistics	
	B	Std. error	Beta (β)			Tolerance	VIF
(Constant)	-0.697	0.721		-0.967	0.334		
Perceived usefulness	0.200	0.035	0.265	5.732	0.000	0.489	2.045
Perceived ease of use	0.127	0.044	0.135	2.876	0.004	0.472	2.119
Perceived enjoyment	0.192	0.041	0.226	4.731	0.000	0.457	2.188
Social influence	0.159	0.043	0.153	3.695	0.000	0.612	1.634
Media influence	0.050	0.043	0.045	1.173	0.242	0.709	1.410
Perceived monetary value	0.027	0.041	0.026	0.659	0.510	0.669	1.495
Perceived mobility	0.127	0.035	0.155	3.619	0.000	0.568	1.761

$F=80.149$, $p < 0.001$, $R^2=0.586$.

greater than 0.10 and VIF values below 10, and thus assumption of multicollinearity has not been violated, based on the commonly used cut-off points for determining the presence of multicollinearity (Pallant, 2007). The model reaches statistical significance (Sig. = .000). The R^2 value for Table 7 is 0.586, which means that the model (which includes perceived usefulness, perceived ease of use, perceived enjoyment, social influence, media influence, perceived monetary value and perceived mobility) explains 58.6% of the variance in consumers' behavioral intention to use the mobile data services, ($F = 80.149$, $p < 0.001$).

Hypotheses testing

The results of the tested hypotheses, H1, H2 H3, H4, H5, H6 and H7 are as follows, with all supporting statistics being taken from Table 7. It is to test the first research question of the study – the factors that influence consumers' intentions to use mobile data services.

H1: Perceived usefulness has a positive influence on consumers' usage intention for mobile data services - with β= 0.265 and p < 0.05; H1 is supported.
H2: Perceived ease of use has a positive influence on consumers' usage intention for mobile data services - with β= 0.135 and p < 0.05; H2 is supported.
H3: Perceived enjoyment has a positive influence on consumers' usage intention for mobile data services - with β= 0.226 and p < 0.05; H3 is supported.
H4: Social influence has a positive influence on consumers' usage intention for mobile data services - with β= 0.153 and p < 0.05; H5 is supported.
H5: Media influence has a positive influence on con-

sumers' usage intention for mobile data services – with β= 0.045 and p > 0.05; H5 is not supported.
H6: Perceived mobility has a positive influence on consumers' usage intention for mobile data services - with β= 0.155 and p < 0.05; H7 is supported.
H7: Perceived monetary value for the use of mobile data services has a positive influence on consumers' usage intention for mobile data services - with β= 0.026 and p > 0.05; H8 is not supported.

Subsequently, to meet the second research question of the study - to find out how much the hypothesized factors influence the usage intention of mobile data services - the strength of Beta value (β) for standardized coefficients was considered. An independent variable makes a significant, unique contribution to the prediction of the dependent variable when the significant value is less than 0.05 (p < 0.05). Based on the results shown in Table 7, perceived usefulness, with the greatest Beta value (β = 0.265, p < 0.05) is the most significant contributor to the prediction of consumers' usage intention for mobile data services, followed by perceived enjoyment (β = 0.226, p < 0.05), perceived mobility (β =0.155, p<0.05), Social Influence (β = 0.153, p < 0.05) and, lastly, perceived ease of use (β = 0.135, p < 0.05). Media influence (β = 0.045, p > 0.05) and perceived monetary value (β= 0.026, p > 0.05) were found to have no significant influence on the consumers' behavioral intention to use the mobile data services, with significant values greater than 0.05 (p > 0.05).

IMPLICATIONS AND CONCLUSION

All factors identified have been empirically tested. The

implications and conclusions of the findings are as follow:

Perceived usefulness

Mobile data services in this study are perceived by consumers to be a useful and productive tool in accomplishing their daily activities. The result supports the previous technology acceptance study by Davis (1989) which revealed that perceived usefulness is one of the major factors that influences attitude and technology adoption.

Perceived enjoyment

Users perceived the mobile data services as interesting, fun, enjoyable, and entertaining. This is partly due to the nature of the mobile data services which cover mobile entertainment and information content service. The result supports the findings of previous studies (Bruner and Kumar, 2005; Davis et al., 1992) which have showed perceived enjoyment or fun is an important factor in determining technology adoption.

Perceived ease of use

The results also indicate that mobile users generally believe that to acquire the skill to use mobile data services is an easy, user-friendly learning experience. A perceived easy and clear interaction between users and the mobile data services promotes interest and consequently leads to consumers' intention to use the technology. The finding is in line with a study by Venkatesh et al. (2003) of the consistently prominent factors in explaining consumer behavior in a variety of adoption models are perceived usefulness and perceived ease of use.

Social influence

Social influence was found to have a significant positive impact on the prediction of consumers' usage intention for mobile data services. This supports previous research that social influence from consumers' peers and superiors concerning technology usage was an important determinant of consumer behavior in information technology adoption contexts (Mathieson, 1991; Taylor and Todd, 1995; Venkatesh et al., 2003).

Media influence

Media influence was found to be an insignificant predictor of mobile data service intention to use in this study. The result conducted through this study reveals that media and advertising do not effectively influence the purchase behavior of mobile data services. Mobile operators in Malaysia are apparently putting less focus in creating awareness and promoting the potential functionality of various mobile data services as their long term growth strategy.

Perceived mobility

Perceived mobility has a positive significant influence on consumers' usage intention for mobile data services. As the mobile data services in this study was scoped to mobile entertainment and information content services, consumers generally perceived that it is important to have strong mobility and coverage to enable them to access these services anytime and anywhere. Therefore, it is important for mobile data services to be able to provide pervasive and ubiquitous connection to motivate consumers' behavioral intention to use the services.

Perceived monetary value

Perceived monetary value from the use of mobile data services was found insignificant to consumers' intentions to use the service. Consumers generally have the perception that mobile data services offer less than good value for money. For instance, to download a game content, the standard mobile data charges or cost incurred could range from estimated RM1.00 (USD$0.30) to RM5.00 (USD$1.50) per download, depending on content size. This cost is in addition to the premium game content charges which can range from RM5.00 (USD$1.50) - RM8.00 (USD$2.40) per game content. For this reason, the customer will have to pay a total estimated price of RM6.00 (USD$1.80) - RM13.00 (USD$3.90) to download and enjoy a premium game content. As the majority of users perceived mobile data services are too expensive to be value for money, hence there is an apparent absence of significance of perceived monetary value in intention to use.

Limitations and suggestion for future research

A major limitation of this study is that the samples were taken only in a metropolitan area in Malaysia, with a large percentage of the respondents being young adult. Besides, the model applied in this study was developed for mobile data services and could have some limitations if applied to other services. With the mobile industry experiencing fast and dynamic change, including change in customers' behavioral intentions, there should be more research conducted to understand the ongoing changes in consumers' behavior.

For future research, the researcher may consider

exploring the difference in consumers' usage intention predictors across different categories of services, for example, communication services, entertainment services, information content services and commercial transaction services. Furthermore, the researcher may explore the moderators of the drivers of mobile data services usage behavior.

Conclusion

In conclusion, this study has empirically supported the identified factors affecting consumers' behavioral intention of mobile data services. The results and discussion derived from this study can be useful to mobile operators and content/application developers to strategize and entice consumers to use their services

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