An Empirical Analysis of Consumer Behavioral Intention Toward Mobile Coupons in Malaysia

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ABSTRACT

Mobile coupons present an exciting new opportunity to target consumers with highly customized offers. Research on the factors influencing attitude and behavioral intention of consumers using mobile coupons is scanty. This study uses the extended technology acceptance model (TAM) as the underpinning to analyze the attitude and behavioral intentions of consumers toward m-coupons. We tested this modified model using data collected from 781 respondents. The results suggest that our proposed model could explain about 66.5% of the variance in customers' intentions to use the mobile coupons. The results of these studies confirm that, in the mobile technology context, traditional adoption models such as TAM could be applied, but they need to be modified and extended in order to increase their robustness and relevance to the context. The results of the study show that perceived usefulness, perceived ease of use, perceived credibility, compatibility, and social factor influence the behavior and intention of consumers in using m-coupons.

Keywords: Mobile coupons, technology acceptance model, discount coupons, mobile marketing

1. INTRODUCTION

The advent of mobile commerce has resulted in a new form of sales promotion. Now, advertisers are deploying digital coupons on mobile phones, aiming to exploit the inherent location and real-time delivery capabilities that make for a more compelling solution than traditional paper coupons. A mobile coupon (m-coupon) is an electronic ticket solicited and/or delivered by mobile phone, which can be exchanged for a financial discount or rebate when purchasing a product or service [MMA, 2007]. Jupiter Research [2008] predicts that nearly 200 million mobile subscribers will use mobile coupons globally by 2013. Technology was the biggest barrier to entry for mobile coupons. The challenge for mobile coupon use, however, has shifted from technology to the willingness of consumers to adopt the innovation. Currently, many companies in Malaysia are using this new mobile channel to create new business opportunities. The mobile operators and other service organizations are providing a new service called "mobile coupons," which enables the downloading of coupons offered by different outlets onto the mobile phones for use later. At present, the m-coupon market is still at infant stage, and it seems that the business opportunities for this innovation are limitless.

Mobile phones are fast becoming ubiquitous. Almost everyone has a mobile phone in his or her pocket. The Malaysia mobile industry has been one of the fastest-growing markets in the world. Almost 93.9% of Malaysia's 27 million people had a mobile telephone service in the third quarter of 2008 [MCMC, 2008]. The rapid growth of the Malaysia mobile industry has largely been due to the development of a simple and highly popular mode of mobile communication. Short messaging system (SMS) statistics from the Malaysian Communication and Multimedia Commission indicate that more than 3,406 million SMS were sent in the first period of 2005 [MCMC, 2008]. This fact shows that consumers are increasingly using mobile phone text messages as a form of communication. Text messages can be customized, and the message can be sent to the target customer base on time. Text messages are slowly becoming another important marketing communication channel for electronic and print media.

Although little is known about consumers' attitudes toward wireless marketing channels, many organizations today are making considerable investments to take advantage of the new business possibilities offered by wireless technologies. Even though there are considerable researches on coupons, there are not many studies on mobile coupons. Little is still known about consumers' attitudes toward adopting, or not adopting, and factors that influence consumers' attitudes and value perceptions about them. It is likely that the new media environment would alter consumers' couponing behavior identified in previous research. However, little attention is given to relatively new types of coupons such as mobile coupons (m-coupons). This paper, therefore, seeks to analyze whether the behavioral attitude and intention of consumers using m-coupons shows the same

result as that from traditional discount coupons and whether there is a difference in influential factors.

We investigate how a new pattern of coupon distribution, which media technology brought about, has changed consumers' existing attitude and behavior toward m-coupon use. Consumers' primary reasons for adopting and intending to adopt mobile coupons remain unclear. The primary objective of this research, therefore, is to determine the acceptance of m-coupons from consumers' perspectives and to explore the factors that can influence their intention to use mobile coupons in Malaysia. We discuss the implication of the findings of this research. We also propose a new model for future research, which explains the causal relationships among mobile coupon consumers' attitude and intentions.

2. THEORETICAL BACKGROUND: A LITERATURE REVIEW

This section discusses the definition and history of coupons (2.1), print coupon redemptive behavior (2.2), the technology acceptance model (2.3), models applied to study mobile technology adoption (2.4), and research model and hypotheses (2.5).

2.1. Definition and History of Coupons

A coupon is a certificate that entitles the bearer to a certain price reduction on a specified product when the goods are purchased, and the retailer honors the discount [Price, 1999]. In coupon promotions, retailers maintain the original price of the product, and it is only coupon holders who are entitled to a discount. Coupons give consumers opportunities to obtain promoted products at reduced prices. Individuals who respond to coupon offers have been referred to as "coupon prone" consumers.

Coupons have been a promotional strategy for more than 100 years. Couponing is one of the oldest, most effective, and most widely used tools to promote sales [Belch and Michael, 1995]. Coupons are very useful mechanisms for carrying out different marketing management functions like sales promotion, brand promotion, and inventory management. Past studies indicate that coupons provide organizations with several benefits, including the ability to attract new buyers, brand switchers, and deal-prone consumers [Blattberg and Neslin, 1990]. One of the challenges of the paper coupon is the difficulty of effectively targeting potential customers interested in the particular promotion. The second challenge is that coupons must be saved and need to be shown or exchanged to redeem at the point of purchase.

2.1.1. E-Coupons

Electronic coupons (e-coupons) differ from traditional paper coupons primarily because of the nature of distribution. E-coupons are usually published on Web pages, and interested customers can download and print them before redemption at a physical store [Blundo, Cimato, and De Bonis 2005]. A number

of specialized Web sites offer Internet coupons (also called print-at-home coupons), in the form of images or bar codes. E-coupons are the electronic version of the real-world coupons, consisting of a sequence of bytes, and can be redeemed at online stores during e-commerce transactions [Jakobsson et al., 1999].

2.1.2. Mobile Coupons

A mobile coupon is an electronic ticket solicited and/or delivered by mobile phone that can be exchanged for a financial discount or rebate when purchasing a product or service [MMA, 2007]. Customarily, coupons are issued by manufacturers of consumer-packaged goods or by retailers to be used in retail stores as a part of sales promotions. They can also be used to attract customers to entertainment attractions and services. They are often distributed through Short Message Service (SMS), Multimedia Messaging Service (MMS), Bluetooth, and other mobile means. The customer redeems the coupon at a store or online. In some cases, the retailer could forward it to a clearinghouse or directly to the issuer for reimbursement.

2.2. Print Coupon Redemption Behavior

There is a continuing debate about the determinants of coupon use. Many researchers have sought to explain coupon deal redemption in terms of the socioeconomic and demographic characteristics of consumers or to identify the psychological factors that motivate consumers to use coupons [Blattberg et al., 1978; Narasimhan, 1984; Bawa and Shoemaker, 1989]. Although they have contributed a lot to our understanding of coupon redemption behavior, there is no coherent evidence for the effectiveness of coupon programs [Mittal, 1994]. Many researchers have sought to identify the characteristics of coupon-prone or deal-prone consumers. According to Bawa, Srinivasan and Srivastava [1997], there are five factors that might affect consumer response to coupons. They are: (a) coupon characteristics, (b) mailer characteristics, (c) brand characteristics, (d) product characteristics, and (e) consumer characteristics.

Shimp and Kavas [1984] applied Ajzen and Fishbein's theory of reasoned action to conceptualize coupon use. They found that both personal attitudes and subjective norms played major roles in determining intentions to use coupons. Bagozzi, Baumgartner, and Yi [1992] studied the intentions to redeem a coupon and the act of coupon redemption. They found that coupon use was influenced jointly by consumers' self-efficacy (confidence in the ability to use coupons), instrumental beliefs (beliefs that it should lead to a favorable outcome), and affect toward means (liking for the act). All these findings suggest that, by paying attention to the design of the direct mail coupon promotion, manufacturers may be able to increase coupon use by reinforcing the perceived

benefits, reducing the perceived costs, and strengthening the link between intentions and redemption behavior [Bawa et al., 1997].

Other researchers have investigated the impact of coupon characteristics on both redemption behavior and redemption intentions [Bawa et al., 1997; Chakraborty and Cole, 1991; Bonniei et al., 1997]. Some of the characteristics most likely to influence the intention to redeem a coupon are (a) the coupon face value, which determines the saving provided, and (b) delivery vehicle (e.g., print coupons, e-coupons and m-coupons), which determines the effort required to collect and redeem it. The other factor is (c) whether the coupon is for a preferred brand or for a brand the consumer occasionally purchases. Higher face value coupons are associated with higher redemption rates [Reibstein and Traver, 1982; Bawa et al., 1997]. When brand loyalty and deal proneness is controlled, the coupon characteristics have little effect on redeeming coupon [Chakraborty and Cole, 1991].

Bonnici, Campbell, Fredenberger, and Hunnicutt [1996] used factor analysis to identify the underlying factors that deter consumers from coupon redemption. Their study revealed that consumers perceive couponed products to be of low quality and feel embarrassed to use coupons in their shopping activities. Coupon use increases as one perceives higher satisfaction and pride with their use [Babakus, Tat, and Cunningham, 1988]. Han, Yoon, and Cameron [2001] investigated how Web user's attitude, intention, and behavior in using online coupons are affected by off-line coupon attitudes. The results indicated that all three independent variables affect Web users' attitude and intention to use online coupons, but do not affect their online couponing behavior.

2.3. Technology Acceptance Model (TAM)

The technology acceptance model (TAM) is an adaptation of the theory of reasoned action (TRA). It is specifically introduced to explain computer use behavior. Developed by Davis [1989], TAM has formed the foundation of many studies in information systems. TAM proposed two measurable variables for technology acceptance; i.e., perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness explains the user's perception to the extent that the system will improve the user's workplace performance; perceived ease of use explains the user's perception of the amount of effort required to use the system or the extent to which a user believes that using a particular system will be effortless [Davis 1989]. Davis et al. [1989] found that PU and PEOU correlated significantly with both self-reported current use and self-predicted future use.

According to TAM, behavioral intention (BI) is a major determinant of use behavior; and that behavior can be predicted by measuring BI. BI is viewed as being determined by how a person considers the perceived usefulness (PU) and ease of use (PEOU) of the systems studied. Since its introduction by Davis [1989] and Davis et al. [1989], TAM has been widely used by researchers to explain user acceptance of technology.

TAM has received extensive empirical support through validations, applications, and replications for its prediction power [Taylor and Todd, 1995]. One of the major theoretical limitations of TAM is the exclusion of the possibility of influence from social and personal control factors [Elliot and Loebbecke, 2000]. The attitude toward adopting a technology is believed to be the result of personal and social influences, and the fact that TAM does not account for social influence is a limitation. Several researchers tried to extend or modify the TAM model to improve its predicting power. In response to this, a number of modifications and changes to the original TAM models have been made [Karmakar and Dooley, 2008].

Venkatesh and Davis [2000] extended the original TAM model to explain perceived usefulness and use intentions in terms of social influence and cognitive instrumental processes. The extended model, referred to as TAM2, was tested in both voluntary and mandatory settings. The results strongly supported TAM2 [Venkatesh and Davis, 2000]. Later, Venkatesh et al. [2003] proposed a unified model, the UTAUT, based on studies of eight prominent models in IS adoption research. It is the most intensive "model elaboration" of the TAM. The model was empirically examined and found to out-perform the eight individual models (adjust $R^2 = 0.69$), including the TAM, by using the data from different user groups using different information systems in different organizations [Han, 2005].

2.4. Models Applied to Study Mobile Technology Adoption

The acceptance of technology has been studied actively already for a couple of decades. Mobile commerce has, in recent years, become a new research issue on the IS agenda. TAM has been the most frequently used base for m-commerce adoption, followed by the theory of reasoned action (TRA) [Fishbein and Ajzen, 1975] and the theory of planned behavior (TPB) [Ajzen, 1991; Okazaki, 2005].

A number of researchers have studied user acceptance of mobile technology and services such as the mobile Internet, text messaging, contact services, mobile payment, mobile gaming, and mobile parking services, based on IS adoption models. Pedersen [2002] conducted an exploratory study about early adopters' behavior with regard to using mobile Internet services. He decomposed the TAM and the TPB to build a new research model in order to understand the phenomena. He found that, at least from a measurement perspective, adoption research models might successfully be applied to the study of mobile service adoption. However, he argued that simple IS adoption research models (e.g., the TAM) should be extended with both subjective norms and behavioral control in attempts to explain the adoption of mobile commerce services. He further recommended that his model could be modified when applied to study other mobile commerce services.

Kwon and Chidambaram [2000] used the TAM to investigate patterns of cellular phone adoption and use in an urban setting. The results of their study confirmed that users' perceptions influence their behavior toward cellular phones, specifically, the perceived ease of use. Hung et al. [2003] used the TAM for evaluating the acceptance and use of mobile commerce by collecting data from students. The perceived usefulness and ease of use were found to have positive impacts on the users' attitudes and behavioral intention. Lapczynski [2004] integrated four technology acceptance models (TAM, TAM2, TPB, TTF) and created a robust model for mobile computing devices. He added three new factors (adaptability, mobility, and security) that act as antecedents of perceived usefulness, which is one of two foundational belief constructs in technology acceptance model theory.

Kleijnen, Wetzels, and Ruyter [2004] investigated consumer acceptance of wireless finance and found that the variables of perceived cost, system quality, and social influence correlated significantly with attitude toward use. The variables such as participants' age, computer skills, mobile technology readiness, and social influence proved to have moderating effects in the mobile phone use context. Social Influence was added to the model, and found to display significant effect on BI. Bedford [2005] used the UTAUT model to investigate acceptance and use of m-commerce. He added trust as one of determinants of behavior intent. The trust factor increased the total variance of the basic model by 2%. Lin and Wang [2005] tested the integrated TAM model by adding perceived credibility, perceived self-efficacy, and perceived financial resources. The results support the integrated model in predicting consumers' intention to use m-commerce.

Hsu, Wang, and Wen [2006] used the decomposed theory of planned behavior to study the factors influencing attitude and behavioral intention of consumers using m-coupons. The results of their study demonstrated that personal innovativeness has no direct relation to behavioral attitude. Behavior and attitude of consumers are largely influenced by endorsement of family and friends. Shen and Chen [2008] used an integrated research model (TPB) to explore the factors that influence consumer intention of using mobile advertising in China. Existing knowledge, perceived usefulness, and perceived ease of use all had positive effects on consumers' use intention.

Amin [2008] extended the applicability of the technology acceptance model (TAM) to mobile phone credit cards and included ''perceived credibility (PC),'' the ''amount of information about mobile phone credit cards (AIMCs),'' and ''perceived expressiveness (PE),'' in addition to ''perceived usefulness (PU)'' and ''perceived ease of use (PEOU).'' The results indicate that PU, PEOU, PC, and the amount of information contained on mobile phone credit cards are important determinants in predicting the intentions of Malaysian customers to use mobile phone credit cards.

The results of these studies confirm that, in the mobile technology context, traditional adoption models such as TAM could be applied, but need modification and extension in order to increase their prediction and explanation power [Han, 2005]. The findings from these studies regarding mobile phone emphasize that social factors, perceived credibility, compatibility, and personal innovativeness should be included in the basic TAM model.

2.5. Research Model and Hypotheses

This study uses the extended technology acceptance model (TAM) as the underpinning model to analyze the attitude and behavioral intentions of consumers toward m-coupons. The research model tested in this paper is shown in Figure 1.

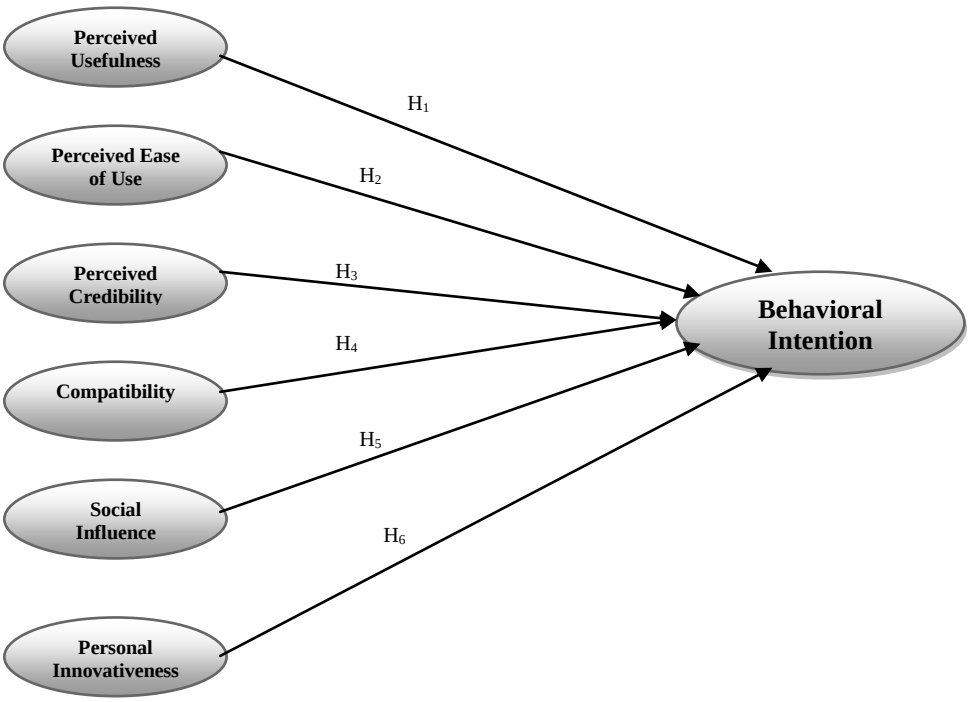

Figure 1. A Model for M-Coupon Behavioral Intentions

Drawing upon the mobile context as discussed in section 2.4 and the studies on technology adoption models as discussed in section 2.3, we decided to modify the TAM by including additional essential variables that specifically relate to the mobile service context. We examined six key determinants of technology acceptance, which include perceived usefulness (PU), perceived ease of use (PEOU), social influence (SI), compatibility (COMP), perceived credibility (PC), and personal innovativeness (PI). In the extended model, like many other studies of TAM, the "attitudes" construct is removed in an attempt to simplify the model [Lin and Wang, 2005].

Social influence, as shown in the unified theory of acceptance and use of technology (UTAUT) and other theories (such as the TRA, the TAM2, and the TPB), has reinforced its ability to explain technology acceptance behavior as the use of technology becomes mandatory. Shimp and Kavas [1984] applied Ajzen and Fishbein's theory of reasoned action to conceptualize coupon use. They found that both personal attitudes and subjective norms played major roles in determining intentions to use coupons.

Perceived credibility is a vital factor in a mobile environment. Based on Wang et al. [2003], perceived credibility is defined as the extent to which a person believes that using m-service will be free of security and privacy threats. There are two key elements in perceived credibility; namely, security and privacy [Lu et al., 2003]. In a wireless environment, security encompasses confidentiality, authentication, and message integrity. Mobile transmissions are more susceptible to hacker attacks and security vulnerabilities. Evidence shows that there is a significant direct relationship between perceived credibility and behavioral intention [Lin and Wang, 2005]. Perceived credibility was also found to have a significant positive influence on the behavioral intentions to use online banking [Wang et al., 2003]. Consequently, perceived credibility is used as a TAM construct to reflect the security and privacy concerns in the acceptance of m-commerce.

Personal differences strongly influence adoption. There is evidence that acceptance of innovations depends as much on individual adopter differences as on the innovation itself [Karmakar and Dooley, 2008]. Compatibility is defined as the degree to which an innovation is perceived to be consistent with existing values of potential adopters [Rogers, 1995]. According to diffusion theory, adoption of innovations is a function of personal innovativeness, or willingness to try the innovations [Jeffres and Atkin, 1996]. Many studies used personal innovativeness as a predictor to explain the adoption of innovations. Rogers [1995] asserted that innovativeness affects the rate of adoption.

Consequently, we examined six key determinants of technology and innovation acceptance in this paper. These determinants are: perceived usefulness (PU), perceived ease of use (PEOU), social influence (SI), compatibility (COMP), perceived credibility, and personal innovativeness (PI). The prior

research review provides us the grounds to develop the hypotheses for this paper. The following, therefore, are the hypotheses we tested in this paper.

H_1: The perceived usefulness by the consumer has a positive effect on the behavioral intention toward using m-coupons.

H_2: The perceived ease of use by the consumer has a positive effect on his or her behavioral intention toward using m-coupons.

H_3: The perceived credibility by the consumer has a positive effect on the behavioral intention toward using m-coupons.

H_4: The compatibility of the consumer in using mobile phone has a positive effect on his or her behavioral intention toward using m-coupons.

H_5: Social influence has a positive effect on behavioral intention toward using m-coupons.

H_6: The personal innovativeness of the consumer has a positive effect on his or her behavioral intention toward using m-coupons.

3. RESEARCH DESIGN AND DATA ANALYSIS

This section discusses the research design for this study (3.1) and data analysis (3.2).

3.1. Research Design

The general aim of this research is to determine the factors that explain the adoption and use of mobile coupon by consumers. In this paper, we carried out a survey with 1,000 mobile phone users in Malaysia in 2008 to investigate their attitude and intention to use mobile coupons. Survey is a widely used data collection technique in behavioral science research. The data were gathered by means of a questionnaire.

The conceptual framework that guided the hypotheses formulation and questionnaire design was depicted earlier in Figure 1. The framework consists of seven research constructs as indicated earlier.

Table 1 provides the key variables, items used to operationalize the variables, and their respective sources. Items selected for the constructs were adapted mainly from prior studies to ensure content validity. Items for perceived ease of use and perceived usefulness were taken from the previous validated inventory and modified to fit the mobile technology studied [Han, 2005]. A pre-test was conducted to validate the instrument. Feedback was obtained about the

layout of the questionnaire and question ambiguity. Some changes were made to the questionnaires as deemed appropriate.

Table 1
Convergent Validity and Internal Consistency Reliability

Description	Item	Cronbach Alpha	Based On
Perceived Usefulness	a. Using m-coupons would make me a smart consumer. b. Using m-coupons would make my shopping easier. c. Using m-coupons would save money. d. Using m-coupons make shopping more enjoyable. e. Overall, m-coupons are very useful.	0.963	Venkatesh and Davis, 1996
Perceived Ease of Use	a. Downloading m-coupon via mobile phone is very easy. b. Mental effort taken to download m-coupon via mobile phone is effortless. c. The task of sending text messages via mobile phone is very simple. d. The task of interacting with the m-coupon ads via mobile phone is very simple. e. Learning to operate the m-coupon is easy for me. f. Using the m-coupons takes too much time from my normal duties. g. Overall, the m-coupon is easy to use.	0.952	Venkatesh and Davis, 1996
Personal Innovativeness	a. When I hear about new mobile technology I look for possibilities to experiment with it. b. I don't want to experiment with new mobile technology. c. I am usually the first to try new information technology. d. I like to experiment with new information technology.	0.856	Han, 2005
Social Influence	a. Most people who are important to me think I should use m-coupons. b. My close friends think I should use m-coupons. c. Most members of my family think I should use m-coupons. d. My peers think I should use m-coupons.	0.934	Shimp and Kanvas, 1984

Table 1 (Cont'd)

Description	Item	Cronbach Alpha	Based On
Perceived Credibility	a. I trust using m-coupon does protect my privacy. b. I am not worried about security in using m-coupons. c. M-coupon use may permit other persons to gain access to my personal important information. d. I am concerned about mobile phone viruses in a transaction over the mobile connection.	0.926	Pikkarainen et. al., 2004
Compatibility	a. Using m-coupons fits into my work style. b. I think that using m-coupons fits well with my life style. c. Using m-coupons is compatible with all aspects of my work.	0.937	Hans, 2005
Behavioral Intention	a. I intend to get more details about m-coupons. b. I intend to download m-coupons. c. I intend to use m-coupons frequently in my personal life. d. I intend to use m-coupons in doing my shopping.	0.962	Venkatesh, Morris, Davis and Davis, 2003

The revised questionnaires were distributed to 1,000 participants in Malaysia, as noted earlier. The areas covered for the survey were Selangor, Kuala Lumpur, Johor, and Sarawak. These areas were selected based on the number of hand phone users in Malaysia. It was found that 22.1% of hand phone users are located in Selangor; 13.5%, in Johor; 8%, in Sarawak; and 8.6%, in Kuala Lumpur [MCMC, 2007]. There were 824 returned responses, for an overall response rate of 82.4%. There were 43 invalid returned responses, which were eliminated before the final data analysis. The main reason given for non-participation was lack of time to complete the survey. Of the respondents, 52% were male. The majority of the respondents (91%) belonged to the age group of 19-33 years old. For 45% of the respondents, monthly income ranged from RM2000 to RM6000. A profile of the respondents is presented in Table 2.

Table 2

Profile of Respondents

Variable	Frequency	(%)	Variable	Frequency	(%)
Gender			Location		
Female	374	48	Selangor and KL	463	59
Male	407	52	Johor	171	22
			Sarawak	147	19
Household Income:			Age		
Under RM 2000	331	42	Under 18	31	4.0
RM 2001 – RM 4000	216	28	19 to 25	482	61.5
RM 4001 – RM 6000	134	17	26 to 33	223	28.5
RM 6001 – RM 8000	45	6	34 to 41	36	4.5
RM 8001 – RM 10000	18	2	42 to 48	6	1.0
RM 10001 and Above	24	3	Above 50	3	0.5
Race					
Malay	396	51	**Total Number of Respond-ents**	**781**	**100**
Chinese	275	35			
Indian	73	09			
Others	37	05			

3.2. Data Analysis

The Statistical Package for Social Science (SPSS), version 16, and Structural Equation Modeling Software (AMOS), version 16, were used to analyze the data. We conducted a reliability test to ensure that the constructs and item responses could be used for further analysis. The Cronbach alphas for all the constructs were more than 0.8 and exceeded the suggested value of 0.70 recommended by Hair et al. [2006]. The result demonstrated that the survey

results have high reliability and ensured a proper ground for further analysis. We also conducted confirmatory factor analysis using AMOS 16 to test the measurement model. We followed the two-step analytical procedure to conceptualize the structural model. The first step was to examine the measurement model, and then the structural model was assessed.

Different indicators were used to assess the overall fit qualities of the model. The adjusted chi square (Cmin/df) represents the first fit indicator. The comparative fit index (CFI) was also used as a fit indicator. Finally, we also analyzed the standardized value and the significance (t-value) of the estimated measurement parameters (paths).

4. RESULTS

In this section, we discuss our results with regard to the measurement model and the structural model.

4.1. Measurement Model

The reliability and convergent validity of the factors was estimated using composite reliability, average variance extracted, and factor loadings (Table 3). The composite reliability was estimated to evaluate the internal consistency of the measurement model. The composite reliabilities of the measures included in the model ranged from 0.8483 to 0.9666. All were greater than the benchmark of 0.70 recommended by Hair et al. [2006]. The average variance extracted of the measures included in the model ranged from 0.5836 to 0.8553. A variance extracted of greater than 0.50 indicates that the validity of both the construct and the individual variables is high Hair et al. [2006].

4.2. Structural Model

Following prior analysis, the structural model shown in the path diagram could then be estimated. We assessed the model fitness and whether the relationships were consistent with theoretical expectations. Comparison of all fit indices, with their corresponding recommended values, provided evidence of a good model fit. Properties of the causal paths, including standardized path coefficients, t-values, and variance explained for each equation in the hypothesized model, are presented in Figure 2.

Table 3
Factor Loading, Composite Reliability, and Average Variance Extracted

Construct	Item	Factor loading	Composite Reliability	Average Variance Extracted
Perceived Usefulness	PUa	0.905	0.9666	0.8529
	PUb	0.938		
	PUc	0.912		
	PUd	0.939		
	PUe	0.923		
Perceived Ease of Use	PEOUa	0.868	0.9510	0.7357
	PEOUb	0.888		
	PEOUc	0.870		
	PEOUd	0.894		
	PEOUe	0.894		
	PEOUf	0.753		
	PEOUg	0.828		
Compatibility	COMa	0.867	0.9261	0.8069
	COMb	0.915		
	COMc	0.912		
Social Influence	SIa	0.803	0.9230	0.7501
	SIb	0.907		
	SIc	0.871		
	SId	0.880		
Personal Innovativeness	PIa	0.794	0.8483	0.5836
	PIb	0.700		
	PIc	0.768		
	PId	0.790		
Perceived Credibility	SECa	0.981	0.9473	0.8183
	SECb	0.857		
	PRIa	0.910		
	PRIb	0.865		
Behavior Intention	BIa	0.911	0.9594	0.8553
	BIb	0.915		
	BIc	0.938		
	BId	0.935		

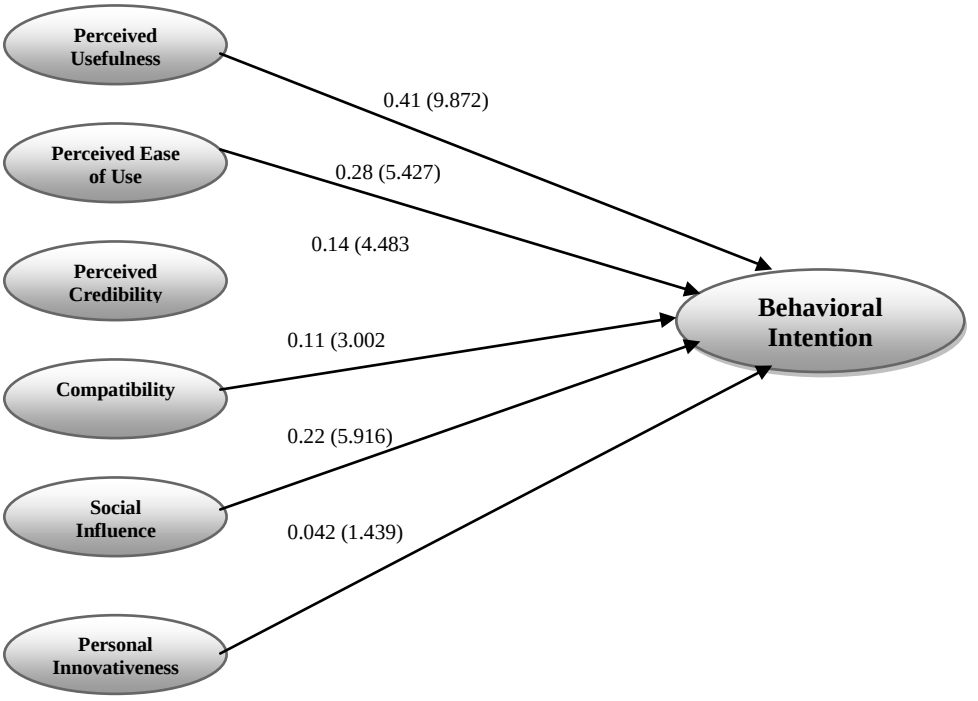

Figure 2. Structural Model of Behavioral Intention to Use M-Coupons

As shown in Table 4, all the model-fit indices exceeded their respective common acceptance levels suggested by Hair et al. [2006], therefore demonstrating that the measurement model exhibited a fairly good fit with the data collected.

Table 4
Fit Indices for Measurement and Structural Models

Fit Indices	Recommended Value	Measurement Model
χ2/d.f.	≤3.00	2.652
GFI	≥0.90	0.939
AGFI	≥0.90	0.912
NFI	≥0.90	0.944
CFI	≥0.95	0.946
RMSEA	≤0.06	0.044

The properties of the causal paths shown earlier in Figure 2, including standardized path coefficients, *t*-values, and variance explained, for each equation in the hypothesized model, are presented in Table 5.

Table 5
Verification Results of the Relationship of Each Construct

Hypothesis	Relationship	Path Coefficient	t-value	p	Verification Results
H_1	Perceived Usefulness → BI	0.414	9.872	0.001	Established
H_2	Perceived Ease of Use → BI	0.282	5.427	0.001	Established
H_3	Perceived Credibility → BI	0.136	4.483	0.001	Established
H_4	Compatibility → BI	0.108	3.002	0.003	Established
H_5	Social Influence → BI	0.219	5.916	0.001	Established
H_6	Personal Innovativeness → BI	0.042	1.439	0.150	Not Significant

As expected, hypotheses H1, H2, H3, H4, and H5 were supported in that perceived usefulness, perceived ease of use, perceived credibility, compatibility, and social influence had significant positive effects attitudes toward m-coupons. Altogether, they account for 66.5% of the variance in behavioral intention. Perceived usefulness strongly determined the behavior intention to use m-coupons. Perceived usefulness ($\beta = 0.41$) contributed more to mobile coupon behavioral intention to use than perceived ease of use ($\beta = 0.28$), social influence ($\beta = 0.22$), perceived credibility ($\beta = 0.14$), and compatibility ($\beta = 0.11$). The relationship between personal innovativeness and intention was insignificant, with a *p*-value of 0.15. This result is consistent with the finding of previous research on m-coupons by Hsu et al. [2006]. The one possible explanation could be the lack of knowledge and awareness about m-coupons in the society. Another possible explanation could be the fact that the innovation is generally new in Malaysia, compared with other forms of coupons.

5. CONCLUSIONS

The findings of the study strongly support the appropriateness of using the extended TAM model to understand the acceptance of mobile coupons in Malaysia from consumers' perspectives. Our result confirms that the behavior intention of mobile coupons is directly influenced by perceived usefulness, perceived ease of use, compatibility, perceived credibility, and social influence. There is no direct relationship between personal innovativeness and behavioral intention, and this result is consistent with the research findings of Hsu et al., [2006]. This model explains 66.5% of variance, which is considered higher for technology acceptance models [Lin and Wang, 2005].

5.1. Implications for Research

The current study contributes to contemporary research on mobile coupons by offering insights into the factors that could contribute to consumer use. First, it has successfully extended TAM with perceived credibility and social influence. This extended TAM model was applied to mobile coupons, and this approach represents a significant departure from the contexts examined in prior studies of mobile services. Consistent with prior studies, perceived usefulness and perceived ease of use were found to be significant antecedents of the behavioral intention to use m-coupons [Venkatesh et al., 2004; Hans, 2005; Hsu et al., 2006]. This study supports prior research, which found the significant effect of perceived credibility on behavioral intention to use IT/IS in the context of mobile marketing [Pikkarainen et. al., 2004; Hsu et al, 2006].

5.3. Implications for Practice

The validated model provides a useful framework for managers needing to assess the possibility of success for m-coupon introductions, and to pro-actively design mobile coupon campaigns. Results illustrate the importance of perceived usefulness related to the adoption of mobile coupons services. Increasing the perceived usefulness of m-coupons by potential customers is very important for mobile marketing practitioners.

Social influence also plays a very important role in behavioral intention to redeem mobile coupons. The attitude and behavior of consumers are still largely influenced by the endorsement of family and friends. Marketing practitioners need to take this factor into consideration when promoting mobile coupons.

The ease of use of mobile coupons plays a significant part in adopting this innovation. The cause of an underused m-coupon may be that potential users do not have enough knowledge resources to use it. Furthermore, organizing education and training courses in various mobile computing technologies can facilitate people's familiarity with m-coupon applications and help them develop positive ease of use beliefs in m-coupons.

The results also indicate that security and privacy issues are important concerns for consumers in using m-coupons. Mobile marketing practitioners need to obtain explicit permission from customers before they send mobile coupons. In addition, companies should try as much as possible to overcome their concerns about spamming.

5.3. Limitations and Suggestions for Future Research

Although this study provides new insights into mobile coupon redemption, there are still various research avenues to pursue. The antecedents of mobile coupon behavioral intentions are similar for adopters and non-adopters. Motivation for not adopting mobile coupons might illustrate different patterns. Future research efforts need to use different variables to study the reasons for not adopting this particular service.

The second limitation concerns the sample. Although the sample size was quite large, it consisted of Malaysian consumers only. This fact has an effect on generalization of the findings. An interesting avenue for further research could be, for example, a detailed study on mobile service use across countries.

The third limitation is that our data contain intention measures rather than behavioral measures. Follow-up studies, therefore, should consider using actual behavioral data. The study results prove several factors that markedly affect the behavior and attitude of consumers in using m-coupons, which can be used for further research.

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