

# Factors affecting mobile shopping: a Vietnamese perspective

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## Abstract

**Purpose** – Mobile shopping is the current trend for firms to conduct business, having great advantages over electronic shopping as well as traditional shopping. The purpose of this paper is to discuss not only the driving forces of mobile shopping behaviors from the theory of reasoned action (TRA) perspective, but also the additional promotion and barrier sides of the mobile business.

**Design/methodology/approach** – A structural equation modeling approach with latent constructs is applied on a self-administered survey data of 208 Vietnamese consumers to test the hypotheses.

**Findings** – The results of this study have proved the predictive power of TRA in exploring consumer behavior in the context of mobile shopping. Also, both promotion and barrier variables have significantly strong impacts on the intention to adopt mobile shopping.

**Research limitations/implications** – Future studies would benefit from investigating other variables (e.g. specific aspects of trust and risk) and using actual behavior (e.g. online purchases).

**Practical implications** – Business managers should pay attention to both promotion and barrier factors to understand how and why Vietnamese consumers adopt mobile shopping.

**Originality/value** – This pioneering study adapts the TRA model with extended promotion and barrier variables to explain mobile shopping in the context of Vietnam.

**Keywords** Self-efficacy, Trust, Mobile shopping, TRA, Perceived risk, Perceived cost

**Paper type** Research paper

## Introduction

Mobile devices and technologies have developed significantly in recent years (Hanafizadeh *et al.*, 2014; Malaquias and Hwang, 2016). Based on this platform, mobile applications and business services have proliferated rapidly around the world (Celik, 2016; Lu, 2014). In line with this trend, mobile shopping has become a popular behavior among e-shopping alternatives (Chong *et al.*, 2012; Hsieh, 2014), with this type of shopping allowing customers to connect to service providers through wireless connections (e.g. 3G, 4G, 5G) and enabling transactions to be performed anytime and anywhere (Dai and Palvi, 2009; Lu, 2014). Mobile shopping is also considered to be faster, more powerful and more effective than computer-based e-commerce (Hsieh, 2014; Nassuora, 2013).

## JEL Classification — M31, O33

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A comprehensive literature review reveals that one of the most frequently discussed topics in previous studies is what factors affect customer intention in the adoption of this modern type of shopping (Dai and Palvi, 2009; Gerpott and Thomas, 2014; Zhang *et al.*, 2012). Previous studies have mainly deployed technological driving factors (e.g. perceived usefulness, perceived ease of use, interactivity and relative advantage) that are borrowed from well-established models such as the technology acceptance model, innovation diffusion theory and the unified theory of acceptance and usage of technology in order to successfully explain and predict the consumer intention to adopt mobile shopping. However, researchers have suggested distinguishing and exploring the role of promotion and barrier factors that differ from the technological perspective toward mobile shopping adoption (Gerpott and Thomas, 2014; Zhang *et al.*, 2012). The inclusion of both affective (e.g. attitude) and cognitive (e.g. subjective norm, self-efficacy, trust) promotion factors is gaining increasing interest, yet barrier factors (e.g. perceived risk, perceived cost) are rarely examined in the context of mobile shopping (Gerpott and Thomas, 2014; Ovčjak *et al.*, 2015; Sanakulov and Karjaluo, 2015; Zhang *et al.*, 2012).

Notably, previous studies were mostly conducted in developed countries (Slade *et al.*, 2015) where infrastructure technologies for shopping are highly developed, in turn reducing the perceived cost to a minimum level. Moreover, electronic shopping and mobile shopping have become an integral part of consumers' lives, leading to high levels of positive attitude and perceived behavioral control in contrast to a low level of perceived risk amongst consumers for online purchasing in those developed countries (Hanafizadeh *et al.*, 2014; Malaquias and Hwang, 2016). Evidence exists proving that perceptions of promotion and barrier factors of consumers toward mobile technologies differ between developed and emerging countries (Hanafizadeh *et al.*, 2014; Malaquias and Hwang, 2016), which in turn leads to contrasting levels in the adoption of mobile shopping. This generates the need to investigate the role of both promotion and barrier factors toward forming the intention to adopt mobile shopping in emerging countries, serving to help policy makers and companies in those countries build appropriate strategies to develop mobile shopping services that sufficiently match customer requirements (Hsieh, 2014).

Vietnam is an emerging country with a fast-growing market, an interesting case for researchers to explore the driving forces of consumer adoption of mobile shopping (Le *et al.*, 2013; Lin *et al.*, 2014). However, according to Lin *et al.* (2014), mobile shopping in Vietnam is still in its early stages, developing quite slowly due to the consumer perception of high risk and cost as well as a lack of trust in mobile shopping. The ultimate success of mobile shopping depends on consumers' perceptions and whether they are willing to adopt this modern shopping approach. As such, managers should have appropriate strategies to promote the development of mobile shopping. Therefore, to better understand how and why Vietnamese consumers decide to use mobile shopping, this study develops and examines a model of both promotion and barrier factors affecting the intention to adopt mobile shopping. The study contributes to the body of literature by providing greater explanatory power for investigating the question of why consumers decide to use mobile shopping in Vietnam.

## Literature review and hypotheses development

### *Mobile shopping and its advantages*

Mobile shopping is defined as the ability to purchase goods anywhere through a mobile device (Nassuora, 2013). Mobile shopping also refers to transactions with a monetary value, either direct or indirect, that is conducted over a wireless telecommunication network (Hsieh, 2014). Mobile shopping is thus a natural extension of traditional e-commerce that allows users to conduct business in a wireless mode, anytime and

anywhere (Chong *et al.*, 2012; Kourouthanassis and Giaglis, 2012). However, compared to traditional e-commerce, mobile shopping has plenty of unique advantages, as summarized in Table I.

It is worth noting that the current potential of mobile shopping far exceeds that of e-commerce due to the increasing number of people who own mobile phones (Chong *et al.*, 2012). For example, mobile shopping services with additional features and different presentation, processing and interaction modalities compared to a desktop computer have enabled a whole new set of unprecedented service capabilities, including location awareness, context sensing and push delivery. This has sparked wholly new service categories, such as location-based and context-aware services (Hsieh, 2014; Kourouthanassis and Giaglis, 2012), generating immense interest in academia and industry alike as to the research challenges and innovation opportunities associated with them (Kourouthanassis and Giaglis, 2012).

*Promotion and barrier factors of mobile shopping in the Vietnamese context*

Mobile shopping is considered to be a new and novel shopping medium, with plenty of unique features and characteristics that might significantly affect the adoption intention of consumers (Hsieh, 2014; Lu, 2014). Hence, this research aims to address a conventional query (i.e. what affects the adoption intentions of consumers) in a new context (i.e. mobile shopping) in an emerging country (i.e. Vietnam) (Zhang *et al.*, 2012) by extending the theory of reasoned action (TRA) to effectively predict behavioral intentions in the context of mobile shopping. TRA was not originally developed for studies on mobile shopping (Wei *et al.*, 2009). Hence, it lacks important constructs in the mobile shopping context such as trust and perceived risk (Pavlou, 2003), as well as perceived cost and self-efficacy (Chong *et al.*, 2012; Chong, 2013).

Advantages	Source
<i>Ubiquity</i> The use of mobile devices enables consumers to receive information and conduct transactions anywhere, anytime	Zhang <i>et al.</i> (2012), Nassuora (2013)
<i>Accessibility</i> Mobile devices enable consumers to be contacted at virtually any time and place	Sanakulov and Karjaluoto (2015)
<i>Convenience</i> The portability of mobile devices and their functions from storing data to access to information or persons are significant	Sanakulov and Karjaluoto (2015)
<i>Localization</i> Location-based applications enable consumers to receive relevant information on which to act	Zhang <i>et al.</i> (2012)
<i>Instant connectivity</i> Instant connectivity or “always on” is becoming more prevalent with the emergence of mobile data networks (3G, 4G). Users of mobile data services will benefit from easier and faster access to the internet	Nassuora (2013)
<i>Time sensitivity</i> Access to real-time information (such as quantities in stock or a clearance sale at a nearby shop) that leads to a spontaneous purchase transaction	Anil <i>et al.</i> (2003)
<i>Security</i> Mobile devices offer a certain level of inherent security	Nabavi <i>et al.</i> (2016)

**Table I.**  
Mobile shopping advantages compared to traditional e-commerce

First, unlike traditional e-shopping (e.g. computer-based e-shopping), mobile shopping is a relatively new shopping trend in Vietnam. Therefore, Vietnamese consumers may avoid using mobile shopping because they think their skills are inadequate, leading them to doubt their ability to successfully execute the transaction. Mobile transactions cannot be completed successfully if the consumers cannot perform confidently under the system limitations (e.g. small screen, limited battery, limited connection speed and bandwidth). Hence, self-efficacy, which is defined as an individual's self-confidence in his or her ability to perform a behavior (Bandura, 1977), is a factor that should be considered when explaining mobile shopping adoption in Vietnam.

Second, unlike in developed countries, mobile shopping in emerging countries like Vietnam is at an early stage. Therefore, there is a lack of experience and skills within businesses to gain trust and decrease the perception of risk amongst consumers. Additionally, consumers with little experience and low-level skills of mobile shopping tend to neglect mobile shopping because of a high perception of risk (Featherman and Pavlou, 2003; Hsieh, 2014; Ibrahim *et al.*, 2014). For example, Vietnamese consumers may have a high perception of risk because of the lack of appropriate government policies, regulations and mobile services laws to secure transaction information and personal information (i.e. privacy and security risk) (Topaloglu, 2012). Hence, the role of promotion (e.g. trust) and barrier (e.g. risk) factors is very important in the context of mobile shopping (Bianchi and Andrews, 2012; Ibrahim *et al.*, 2014; Nassuora, 2013; Pavlou, 2003; Pavlou and Fygenson, 2006; Slade *et al.*, 2015). Indeed, the roles of trust and perceived risk in a mobile shopping context seem to be much more important than their role in a traditional e-commerce context (Zhang *et al.*, 2012), especially in emerging countries like Vietnam.

Finally, it has been argued that in the process of transference from traditional e-shopping to mobile shopping, consumers have to bear various costs such as equipment (buying cellular-enabled mobile devices), access (mobile internet fees) and conversion (Chong *et al.*, 2012). In an emerging country like Vietnam, these costs may increase the total cost of using mobile shopping to a level higher than that of wired e-commerce and impede the intention to use mobile shopping. For instance, the lowest price of a cellular-enabled smartphone is equivalent to the average monthly income of Vietnamese people (about VND 4m). Furthermore, mobile internet fees are relative high compared to the maximum data capacity supplied. Also, it is worthy to note that while sharing a PC between members in Vietnamese families is popular, individuals in families tend to use smartphones for personal purposes, and there is therefore no sharing of smartphones between family members. Hence, perceived cost has a more important role regarding behavioral intention in the context of mobile shopping than traditional e-commerce in Vietnam. Based on the arguments above, we expect perceived cost to have a significant role in explaining the intention to adopt mobile shopping in Vietnam.

Prior studies have suggested that the higher level of positive attitude, subjective norm, trust and self-efficacy leads to the higher possibility of mobile shopping adoption while the increase of perceived risk and cost weakens consumer adoption intention (Gerpott and Thomas, 2014; Ovčjak *et al.*, 2015; Sanakulov and Karjaluoto, 2015; Zhang *et al.*, 2012). Hence, positive attitude, subjective norm, trust and self-efficacy could be considered as promotion factors whilst perceived risk and cost could be seen as barrier factors toward mobile shopping intention. Since self-efficacy, perceived trust/risk and perceived cost have important role toward mobile shopping intention adoption, we expect that the integration of these variables into the TRA will increase efficiency and effectiveness in explaining the intention to adopt mobile shopping.

Although previous studies have examined facilitator factors (San-Martin *et al.*, 2015; Wang *et al.*, 2015) and barrier factors (Lian and Yen, 2013, 2014), these research studies have investigated two group of factors separately and independently. As far as we know,

there is just a handful of studies examining both of these in one single framework (Gupta and Arora, 2017) such as TRA, while some findings, both in the psychology (Westaby *et al.*, 2010) and marketing (Chatzidakis and Lee, 2012; Claudy *et al.*, 2014; Claudy *et al.*, 2013) fields, support the argument that promotions and barriers can be integrated and studied together. Therefore, this study aims at filling the gap by incorporating and examining both the promotions and barriers of mobile shopping adoption under the TRA framework. As such, we contribute to the mobile shopping and innovation adoption literature by generating a deeper and broader knowledge of the combined effect of facilitators and barriers in consumer decision making in the adoption of mobile shopping. We further contribute by not only investigating affective promotion factors (e.g. consumer attitudes) but also examining cognitive facilitator factors (e.g. subjective norm, self-efficacy, trust) which in turn form a more comprehensive picture of how affective and cognitive components jointly influence the consumer intention to adopt mobile shopping. It is worth noting that the integration of these promotion and barrier factors is in line with previous studies that suggest exploring the role of promotion and barrier factors that differ from the technological perspective (Gerpott and Thomas, 2014; Zhang *et al.*, 2012).

#### *TRA-related factors and the intention to adopt mobile shopping*

Mobile shopping is still in an early phase in Vietnam and, therefore, the number of people using mobile shopping is still limited. Therefore, studying behavioral intention is more appropriate than studying actual use (Yang, 2005). With this in mind, we focus on the intention to adopt mobile shopping as a dependent variable. This is consistent with studies conducted in countries which have the same level of development with regard to mobile shopping as Vietnam (Chong *et al.*, 2012; Wei *et al.*, 2009; Zarpou *et al.*, 2012). The intention to adopt mobile shopping is defined as the subjective evaluation of an individual's ability to perform online transactions via mobile devices and wireless connectivity (Ajzen, 1991; Yang, 2005).

According to recent literature reviews and meta-analysis studies (Gerpott and Thomas, 2014; Ovčjak *et al.*, 2015; Zhang *et al.*, 2012), the TRA (Ajzen and Fishbein, 1975) is one of the most widely used models to explain the adoption of mobile services. TRA posits that behavioral intentions are a function of an individual's attitude toward behavior and the subjective norms surrounding the performance of the behavior. Even though several competing theories of TRA have been developed, such as the technology acceptance model, model of information systems success or unified theory of acceptance and use of technology in the context of technology adoption, TRA has been argued to possess a consistent robustness and parsimony in explaining different behaviors including mobile service adoption over time (Bagozzi, 2007; Benbasat and Barki, 2007). According to TRA, the consumer behavioral intention is predicted by consumer attitudes toward the behavior in question and subjective norm.

Consumer attitudes are the predisposition to perform or not to perform a behavior (Ajzen, 1991). According to Eagly and Chaiken (1993, p. 1), they are defined as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor". Attitude is considered as an important factor influencing behavioral intention in TRA. The positive association between attitudes and intention is extensively confirmed in different domains of e-commerce (Nabavi *et al.*, 2016; Pavlou and Fygenson, 2006) and mobile technology usage including mobile internet, mobile services and mobile shopping adoption (Ovčjak *et al.*, 2015; Sanakulov and Karjaluoto, 2015; Zhang *et al.*, 2012). Therefore, the first hypothesis is as follows:

- H1.* Attitudes toward mobile shopping have a positive effect on the intention to adopt mobile shopping.

The subjective norm is defined as a social influence regarding whether one should take part in mobile shopping (Ajzen, 1991) or not. This influence may come from friends, family or mass media. In TRA, the subjective norm has an important role in explaining technology acceptance. Empirical results demonstrate that the subjective norm (or social influence) has a significant impact on mobile shopping adoption intention in China and the USA (Chong *et al.*, 2012), Malaysia (Wei *et al.*, 2009) and Hong Kong (Khalifa and Shen, 2008). Hence, we believe that the subjective norm has an important role toward mobile shopping in Vietnam and propose the following hypothesis:

*H2.* Subjective norm has a positive effect on the intention to adopt mobile shopping.

*Other promotion factors of the intention to adopt mobile shopping*

It is important to note that consumer belief in the ability to achieve desired outcomes may form a positive attitude toward the usability of an unfamiliar technology like mobile shopping (Venkatesh and Davis, 1996). In an IT context, previous studies demonstrated empirical evidence that self-efficacy can help overcome anxiety (Compeau *et al.*, 1999; Fagan *et al.*, 2004). Furthermore, Hill *et al.* (1986) found that self-efficacy predicts intentions to use a wide range of technologically advanced products. Self-efficacy is considered as a personal judgment about the adequacy of knowledge, skill and willpower to accomplish an online shopping task (Celik, 2016). In a mobile shopping context, self-efficacy is consumers' judgment of their ability to use mobile shopping effectively (Compeau and Higgins, 1995). According to the Vietnam Digital Landscape 2017 report by WeAreSocial (2017), Vietnamese mobile users have a tendency to use mobile devices for hedonic purposes such as watching online videos, joining social network platforms (Facebook, Twitter and Instagram) and playing games in addition to utilitarian purposes including seeking product information, checking e-mail and using location-based services. This implies that the more capable Vietnamese consumers are of using a mobile phone, the more likely they are to feel comfortable using other services delivered through the smartphone. Thus, Vietnamese consumers who are confident in their skills to use mobile devices and mobile technologies are more likely to adopt mobile shopping. Hence, we suggest the following hypothesis:

*H3.* Self-efficacy has a positive effect on the intention to adopt mobile shopping.

Researchers have agreed that trust only exists in a risky and uncertain environment (Grabner-Kräuter and Kaluscha, 2003; Nassuora, 2013; Slade *et al.*, 2015). When using mobile shopping, Vietnamese consumers must face risks at different levels (Bianchi and Andrews, 2012; Grabner-Kräuter and Kaluscha, 2003; Slade *et al.*, 2015) because of the intrinsic nature of mobile shopping (Shaw, 2014; Srivastava *et al.*, 2010). For example, Vietnamese consumers may receive products which differ from the sellers' description in terms of color, quality and size. Even worse, they might lose money without receiving purchased items. As a result, Vietnamese consumers will keep away from untrusted sellers, and gravitate toward buyers whom they perceive to be competent and trustworthy. Hence, "trust" needs to be examined in studies of mobile shopping adoption in the Vietnamese context. We define trust as the perception of consumers that mobile shopping does not pose any threats to security and their personal information (Wei *et al.*, 2009). A great number of prior studies on the intention to adopt mobile shopping have considered trust as the most important construct in the research model. Most of them have proved the positive effect of trust on the intention to adopt mobile shopping (Chong *et al.*, 2012; Nassuora, 2013; Wei *et al.*, 2009). Hence, we believe that trust plays an important role when it comes to mobile shopping in Vietnam, and consequently, the next hypothesis is proposed as below:

*H4.* Trust has a positive effect on the intention to adopt mobile shopping.

*Barrier factors of the intention to adopt mobile shopping*

As mentioned above, trust plays an important role in mobile shopping, where consumers are vulnerable to greater risks of uncertainty and a sense of loss of control (Lu *et al.*, 2011; Zhou, 2014). Based on the definition of risk by Featherman and Pavlou (2003), we define perceived risk in a mobile shopping context as the potential for loss in the pursuit of a desired outcome of using mobile shopping. Pavlou (2003) emphasized uncertainty and risk in the context of the internet and suggested the need to ameliorate risk as having a direct effect on the intention to adopt online transactions. Prior studies have demonstrated that many customers are unwilling to perform online transactions because they perceive that there can be a potential risk (Al-Jabri and Sohail, 2012; Ibrahim *et al.*, 2014; Slade *et al.*, 2015). Hence, perceived risk is a barrier to the intention to adopt mobile shopping. Also, this viewpoint has been demonstrated in many current studies (Sanakulov and Karjaluoto, 2015). In the Vietnamese context, consumers may have feelings of uncertainty about mobile shopping and the importance of possible negative outcomes, because to them mobile shopping is considered as inherently risky. For example, consumers might consider security and privacy (Topaloğlu, 2012) as an important part of the acceptance of online transactions due to the separation between payer and payee (e.g. spatial and temporal). They might also have concerns about vulnerability to security violations resulting from the wireless communications infrastructure. There are evidences that credit card information is stolen during the online purchase of products and services in Vietnam (*ThanhNienNews*, 2015). In addition, consumers might be confused by the complexity of the current mobile payment system in Vietnam; this in turn increases their perception of risk regarding the security of mobile shopping. Hence, we believe that perceived risk has an important role in mobile shopping in Vietnam and thus postulate the following hypothesis:

*H5.* Perceived risk has a negative effect on the intention to adopt mobile shopping.

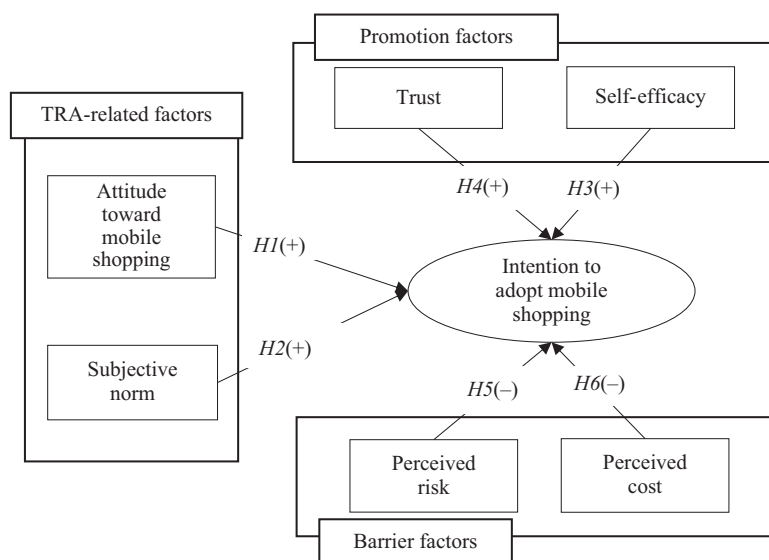
Perceived cost is the perception that using mobile shopping is costly (Wei *et al.*, 2009). Perceived cost is one of the reasons that have slowed down the development of mobile shopping. Furthermore, perceived cost is considered as one of the most important barriers to the application of mobile services at present (Anil *et al.*, 2003; Wei *et al.*, 2009). Dai and Palvi (2009) reported that perceived cost has a significant effect on the intention to adopt mobile shopping in China. A similar result has been found in Wei *et al.*'s (2009) research on the intention of consumers to adopt mobile shopping in Malaysia. Vietnamese consumers' cost perception for using mobile shopping could be considered as the total of the perceived cost of a cellular connection and a smartphone. Due to its high price and limited data capacity, consumers might perceive the cost of mobile internet access as much higher than wired internet. Also, the average price of a smartphone with a cellular connection is still high. As a result, we assume that Vietnamese consumers would have high perception of cost of using mobile shopping which impedes their intention to adopt mobile shopping. Thus, we propose the next hypothesis:

*H6.* Perceived cost has a negative effect on the intention to adopt mobile shopping (Figure 1).

**Methodology**

*Research sample*

In order to collect data to assess the measurement and test hypotheses, a survey is designed for this research. Items adopted in previous well-established studies were translated into Vietnamese, and then were translated back to English by a language instructor.



**Figure 1.** Extended TRA research model and hypotheses

Two versions of the English questionnaire were compared to check the wording of the Vietnamese version.

This research survey targeted customers of the three main telecommunication service providers in Vietnam (i.e. Vinaphone, Mobifone and Viettel). Furthermore, these customers needed to have smartphones with 3G subscriptions that provide functions to facilitate mobile shopping. Data were collected in a self-administered survey and conducted in-store. The questionnaires were distributed directly to respondents. To minimize bias on the answers, we emphasized that the study only focused on personal opinions – there were no right or wrong answers. Furthermore, the respondents were clearly informed that the study concerned mobile shopping.

In total, 250 questionnaires were sent out and returned. Of these 250 questionnaires, 42 were rejected because of missing data. The remaining 208 valid samples were used for further data analysis. According to Kline (2011), the sample size of 200 cases corresponds to the approximate median sample size in surveys of 93 structural equation model (SEM)-adopted published papers in management science field (for a review, please also see Shah and Goldstein, 2006). Furthermore, the research model in the present study is not too complex; thus, the sample size of 208 consumers is satisfactory for SEM analysis (Kline, 2011). The profile of the participants is shown in Table II.

### Measurements of constructs

All the measurement scales were adapted from previous empirical studies. Specifically, the attitude measurement was adopted from Taylor and Todd (1995). The subjective norm measurement was adopted from Kalinic and Marinkovic (2015), while the self-efficacy measurement was adopted from Luarn and Lin (2005). The trust measurement was adopted from Wei *et al.* (2009). The perceived risk and perceived cost measurement is adopted from Wu and Wang (2005). Finally, the mobile shopping intention is adopted from Davis *et al.* (1989). The detailed items and academic sources of the measurement item are shown in Table III. The seven-point Likert scale was employed to measure consumer perceptions with: 1 = totally disagree; 4 = neither disagree nor agree; 7 = totally agree.



**Table II.**  
Research sample  
description

Attribute	Quality	%
<i>Gender</i>		
Male	100	48.08
Female	108	51.92
<i>Age</i>		
Under 25	40	19.23
From 25 to under 34	60	28.85
From 35 to under 44	63	30.29
From 45	45	21.63
<i>Occupation</i>		
Student	35	16.83
Employees of state companies	50	24.04
Employees of private companies	51	24.52
Self-employed business	40	19.23
Other	32	15.38

#### *Analysis procedure*

Cronbach's  $\alpha$  and confirmatory factor analysis (CFA) are applied using SPSS and AMOS to test reliability, convergent validity and discriminant validity. Subsequently, the SEM is used to test the hypotheses. Finally, statistics on the model fit will be reported.

## **Results**

### *Validation of measures: reliability and validity*

The results of Cronbach's  $\alpha$  test showed that all measurements achieve internal consistency ( $\alpha > 0.7$ ). The constructs were assessed to ensure convergent and discriminant validity by performing CFA using AMOS. Since skewness values ( $-0.69$  to  $+0.48$ ) and kurtosis values ( $-1.08$  to  $+0.03$ ) of all items are in an appropriate range ( $\pm 2.58$ ), it could be concluded that they are normally distributed (Tabachnick and Fidell, 2007).

The results, summarized in Table IV, indicated that the measurement model fit the data well ( $\chi^2 = 457.13$  (df = 327),  $p = 0.000$ ; CMIN/df = 1.4; RMSEA = 0.04; GFI = 0.87; AGFI = 0.85; IFI = 0.97; NFI = 0.90; CFI = 0.97, SRMR = 0.05; PClose = 0.86).

All composite reliability (CR) measures exceeded the minimum value of 0.60 and all average variances extracted (AVE) exceeded the minimum value of 0.50. Also, Cronbach  $\alpha$  values were higher than 0.70. The individual item loadings on the constructs were all significant ( $p < 0.001$ ;  $t$ -value  $> 6$ ) with values ranging from 0.65 to 0.90, showing that the convergent validity of the constructs was acceptable.

As shown in Table V, the squared correlation between each of the constructs (highest value 0.47) was less than the AVE value from each pair of constructs (lowest value 0.57), demonstrating discriminant validity.

### *Checking for common method bias*

To test common method bias, we adopted an approach of single-common-method factor (Podsakoff *et al.*, 2003). The results show that common-method factor model has slightly better fit indices than those of the basic model (RMSEA: 0.04 vs 0.04; GFI: 0.90 vs 0.87; AGFI: 0.85 vs 0.85; IFI: 0.98 vs 0.97; NFI: 0.92 vs 0.90; and CFI: 0.98 vs 0.97). However, the correlations between the constructs are almost the same between the two models. Thus, the common-method biases are not problematic in this research (Podsakoff *et al.*, 2003).

Constructs	Items	Notation	Source
Attitude (ATT)	I like the idea of using mobile shopping	ATT1	Taylor and Todd (1995)
	Using mobile shopping is a wise idea	ATT2	
	Using mobile shopping is a good idea	ATT3	
	Using mobile shopping is a positive idea	ATT4	
Subjective norm (SN)	Relatives and friends have an influence on my decision to use mobile shopping	SN1	Kalinic and Marinkovic (2015)
	Mass media (e.g. TV, radio, newspapers) have an influence on my decision to use mobile shopping	SN2	
	I would use mobile shopping more often if the service was widely used by people in my community	SN3	
	It is the current trend to use mobile shopping	SN4	
Self-efficacy (SE)	I could conduct mobile shopping transactions using the mobile banking systems...		Luarn and Lin (2005)
	...if I had just the built-in help facility for assistance	SE1	
	...if I had seen someone else using it before trying it myself	SE2	
	...if someone showed me how to do it first	SE3	
Trust (T)	I believe payments made through mobile shopping channel will be processed securely	T1	Wei <i>et al.</i> (2009)
	I believe transaction conducted through mobile shopping will be secure	T2	
	I believe my personal information will be kept confidential while using mobile shopping technology	T3	
	I think using mobile shopping in monetary transactions has potential risk	PR1	
Perceived risk (PR)	I think using mobile shopping in product purchases has potential risk	PR2	Wu and Wang (2005)
	I think using mobile shopping in merchandise services has potential risk	PR3	
	I think using mobile shopping puts my privacy at risk	PR4	
Perceived cost (PC)	I think the equipment cost is expensive of using mobile shopping	PC1	Wu and Wang (2005)
	I think the access cost is expensive of using mobile shopping	PC2	
	I think the transaction fee is expensive of using mobile shopping	PC3	
Intention to adopt mobile shopping (MS intention)	I intend to use mobile shopping	I1	Davis <i>et al.</i> (1989)
	I expect that I would use mobile shopping	I2	
	I plan to use mobile shopping	I3	
	I am ready to use mobile devices to make commercial transactions	I4	

**Table III.**  
Measurements of research constructs

### Hypotheses testing

Structural equation modeling analysis was carried out for two comparative models to clarify the contributions of this study in explaining the adoption of the intention of mobile shopping. The TRA model estimates the effects of attitude and subjective norm on the intention to adopt mobile shopping. The extended TRA model adds trust, self-efficacy, perceived risk and perceived cost to examine their impacts on the intention to adopt mobile shopping. The results indicated an acceptable fit for the two estimation models. Although the estimation results were consistent with each other for the two models, the predictive power of the extended TRA model was significantly higher than the original TRA model, with  $R^2$  values of 0.61 and 0.19, respectively (see Table VI). The results of the extended TRA model seem to be more robust and provide greater insight.

Constructs and indicators	Factor loadings	<i>t</i> -value	Cronbach's $\alpha$	CR	AVE
Attitude (ATT)			0.88	0.88	0.65
ATT1	0.84	(fixed)			
ATT2	0.81	13.30			
ATT3	0.77	12.36			
ATT4	0.82	13.50			
Subjective norm (SN)			0.88	0.88	0.71
SN1	0.91	(fixed)			
SN2	0.84	14.40			
SN3	0.77	13.06			
Self-efficacy (SE)			0.86	0.86	0.67
SE1	0.84	(fixed)			
SE2	0.81	12.61			
SE3	0.80	12.38			
Trust (T)			0.87	0.87	0.69
T1	0.88	(fixed)			
T2	0.77	12.74			
T3	0.84	14.17			
Perceived risk (PR)			0.82	0.82	0.53
PR1	0.74	(fixed)			
PR2	0.71	9.43			
PR3	0.79	10.30			
PR4	0.66	8.77			
Perceived cost (PC)			0.90	0.90	0.75
PC1	0.89	(fixed)			
PC2	0.81	14.65			
PC3	0.89	16.83			
MS intention (I)			0.96	0.95	0.82
I1	0.86	(fixed)			
I2	0.94	19.73			
I3	0.95	20.24			
I4	0.87	26.46			

**Table IV.**  
Constructs and indicators

**Note:** All factor loadings are significant at  $p < 0.001$

**Table V.**  
Means, standardized deviation and correlations

Variables	Mean	SD	Correlations							
			1	2	3	4	5	6	7	
1. Attitude	4.72	1.38	0.81							
2. Subjective norm	3.81	1.42	0.10	0.84						
3. Self-efficacy	4.70	1.30	0.26	0.27	0.82					
4. Trust	3.42	1.44	0.20	0.28	0.48	0.83				
5. Perceived risk	3.57	1.20	-0.25	-0.26	-0.63	-0.62	0.72			
6. Perceived cost	3.79	1.50	0.57	-0.01	-0.01	-0.03	0.06	0.86		
7. MS intention	4.40	1.57	0.29	0.34	0.58	0.64	-0.64	-0.08	0.91	

**Notes:** MS, mobile shopping. The values of AVE are on the diagonal

Regarding extensive variables, analysis results show that trust had the most powerful and positive impact on the intention of consumers to adopt mobile shopping ( $H4$ ,  $\beta = 0.34$ ,  $t = 4.4$ ,  $p < 0.001$ ), followed by attitude toward mobile shopping ( $H1$ ,  $\beta = 0.26$ ,  $t = 3.6$ ,  $p < 0.001$ ). Self-efficacy and subjective norm also had a positive impact on the intention to adopt mobile shopping ( $H3$ ,  $\beta = 0.18$ ,  $t = 2.1$ ,  $p < 0.05$ ;  $H2$ ,  $\beta = 0.12$ ,  $t = 2.2$ ,  $p < 0.05$ , respectively). Among the extended variables, perceived cost and perceived risk were

Table VI.  
Hypotheses testing results

Relationship	TRA model		Research model	
	Std. $\beta$	$t$ -value	Std. $\beta$	$t$ -value
<i>H1</i> : attitude → MS intention	0.26	3.6***	0.21	2.8**
<i>H2</i> : subjective norm → MS intention	0.32	4.4***	0.12	2.13*
<i>H3</i> : self-efficacy → MS intention			0.19	2.4*
<i>H4</i> : trust → MS intention			0.33	4.3***
<i>H5</i> : perceived risk → MS intention			-0.23	-2.4*
<i>H6</i> : perceived cost → MS intention			-0.18	-2.5*
$R^2$ (intention)		0.19		0.59
Effect size (ES)		-		49.4%
CMIN/df		1.1		1.4
RMSEA		0.02		0.04
CFI		0.99		0.97
TLI		0.99		0.97
GFI		0.96		0.88
AGFI		0.94		0.85
SRMR		0.03		0.05
PClose		0.92		0.83

**Notes:** MS, mobile shopping;  $ES = (R_i^2 - R_{i-1}^2) / (1 - R_{i-1}^2)$ ;  $i = 2, 3$ . \* $p < 0.1$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$

two barrier factors. As expected, these factors had equally strong and negative effects on the intention to adopt mobile shopping (*H5* (perceived risk),  $\beta = -0.21$ ,  $t = -2.3$ ,  $p < 0.05$  and *H6* (perceived cost),  $\beta = -0.21$ ,  $t = -3.11$ ,  $p < 0.05$ ).

## Conclusion

This research is conducted in response to the need to extend TRA with additional promotion and barrier constructs to answer the frequently asked question as to what factors affect consumers' intention to shop online in a new context (i.e. mobile shopping) (Ovčjak *et al.*, 2015; Sanakulov and Karjaluo, 2015; Zhang *et al.*, 2012) for an emerging country like Vietnam. Hence, a theoretical model is proposed based on the TRA framework with trust/self-efficacy as a promotional factor, and perceived risk/perceived cost as a barrier, to explain the intention to adopt mobile shopping. The analytical results show the reliability and validity of the constructs and the good fit of the extended model. In addition to the improvement upon the predictive power of the original TRA model, promotion and barrier variables are found to have significant direct effects on the intention to adopt mobile shopping. Therefore, this study has some important contributions from both academic and practical perspectives.

### Main findings and theoretical implications

This study shows consistencies with prior studies in terms of confirming the predictive power of TRA in explaining diverse types of behaviors. Furthermore, the results once again confirm that TRA is supportable and robust in the mobile shopping setting (Zhang *et al.*, 2012) in an emerging country like Vietnam. Also, TRA is a useful theoretical framework to integrate additional variables. This study attempts to integrate important promotion and barrier factors in a mobile shopping context to investigate how the existence of those variables influences customer behavioral intentions. However, it is worthy to note that unlike prior studies, this study does not intend to increase the variance explained by adding an abundance of variables. Instead, based on recent literature review and meta-analysis studies (Gerpott and Thomas, 2014; Nabavi *et al.*, 2016; Zhang *et al.*, 2012), we select only the most important variables (i.e. trust, self-efficacy, perceived risk, perceived cost).

Discussing and investigating the role of those promotion and barrier variables in explaining the intention to adopt mobile shopping provides a more comprehensive understanding compared with the few previous studies which have applied TAM or TPB to explain mobile shopping behaviors. Interestingly, the addition of those variables significantly increases the explanatory power of TRA in predicting variance explaining the intention to adopt mobile shopping (from 19 to 61 percent) in the Vietnamese context, while still retaining the simplicity and robustness of the model. Therefore, future studies on the mobile shopping context should consider using TRA as a fundamental framework to provide a deeper and broader understanding of consumer behavior.

As an affective promotion factor, the strong impact of attitude on behavioral intention is well confirmed in a number of previous studies regarding mobile services, including mobile shopping (Armitage and Conner, 2001; Kuo and Yen, 2009; Pavlou and Fygenson, 2006). Notably, a recent meta-analysis confirms that the correlation between attitude and behavior in a mobile service setting is very high (0.632) (Zhang *et al.*, 2012). Hence, we might conclude that attitude is an important factor to explain mobile shopping intention. That is, the more positive attitude consumers have toward mobile shopping, the greater the possibility consumers will adopt it. Furthermore, it may conclude that the role of attitude toward consumer behavior is solid across the electronic commerce domain, including e-business, traditional electronic commerce, mobile commerce or even social commerce (Ovčjak *et al.*, 2015; Sanakulov and Karjaluoto, 2015; Zhang *et al.*, 2012). As a result, forming and consolidating positive consumer attitudes could be considered as the key of success in mobile business.

Regarding cognitive promotion factors, subjective norm is found to have a positive significant effect on the intention to adopt mobile shopping, consistent with previous studies (Ovčjak *et al.*, 2015; Sanakulov and Karjaluoto, 2015; Zhang *et al.*, 2012). It means that consumers are more likely to adopt this new trend of shopping if other important contacts (e.g. friends, family, colleagues) receive positive results from using mobile shopping. Furthermore, since mobile shopping is considered as a relatively new, novel and innovative shopping trend, consumers need evidence that mobile shopping is likely to be typical or normal, effective, adaptive and appropriate. That makes the role of subjective norm become more salient in an innovation adoption context such as mobile shopping. However, subjective norm is a weaker predictor than attitude in the current setting. The literature consistently suggests the limited ability of norms in predicting intention or behavior (Armitage and Conner, 2001; Trafimow and Finlay, 1996). Many scholars conclude that norms are important but need to be conceptualized into normative (social, subjective or injunctive) and informational (descriptive) social influences (Armitage and Conner, 2001; Sheeran and Orbell, 1999), rather than seeing norms as a unitary construct (Terry and Hogg, 1996). Thus, future studies on mobile shopping should consider including the descriptive norms to improve the role of norms in explaining mobile shopping intention.

The impact of self-efficacy on the intention to adopt mobile shopping is consistent with the findings of previous studies (Ovčjak *et al.*, 2015; Sanakulov and Karjaluoto, 2015; Zhang *et al.*, 2012), which have found that self-efficacy has a significant influence on the intention to adopt mobile services. This indicates that consumers who are confident of their abilities to use mobile services (e.g. mobile shopping) are more likely to adopt such shopping services (Compeau and Higgins, 1995). Also, the finding suggests that a consumer's intention to adopt mobile shopping can be achieved by reinforcing consumer self-efficacy through providing adequate knowledge, training mobile shopping usage skills and forming and consolidating their willpower.

The last cognitive promotion factor, trust, has strongest positive impact on the intention to adopt mobile shopping. Trust has been confirmed to have an important role in the

adoption of mobile services (Chong *et al.*, 2012; Lu *et al.*, 2011; Pavlou, 2003; Pavlou and Fygenson, 2006; Shaw, 2014; Srivastava *et al.*, 2010). However, to our best knowledge, there is no study which confirms trust as the most significant factor affecting the intention to adopt mobile shopping. This is because trust can differ from country to country (e.g. cultural difference) (Slade *et al.*, 2015). For example, Vietnamese people express the importance of trust through the idiom, “Fool me once, shame on you. Fool me twice, shame on me.” In the increasingly intense competitive e-commerce industry, including mobile shopping, trust is significant in building solid, long-term relationships between businesses and consumers. Furthermore, trust is seen as a common mechanism for reducing perceived risk in mobile shopping, since it supports the increase of a positive outcome expectation as well as a certainty perception deriving from a particular behavior (Pavlou, 2003). Thus, understanding consumer trust has become one of the main focuses in technology adoption research. This generates the need to conduct more studies on trust to better understand the impact of this variable on behavioral intention.

The negative impact of perceived risk on the intention to adopt mobile shopping has been evidenced in previous studies (Al-Jabri and Sohail, 2012; Khalifa *et al.*, 2012; Lu *et al.*, 2011). However, few studies show the non-significant effect of perceived risk on the adoption intention of mobile services (Kapoor *et al.*, 2015; Tan *et al.*, 2014). This is understandable because, like trust, risk is also a cultural construct. However, given the novelty of mobile shopping technology, and the lack of laws and regulations, it is likely that Vietnamese consumers' behavioral intentions toward adopting mobile shopping will be negatively affected by perceptions of risk as confirmed by research findings. The research finding that perceived cost has a strong effect on the intention to adopt mobile shopping demonstrates consistence with previous studies (Anil *et al.*, 2003; Dai and Palvi, 2009; Wei *et al.*, 2009). The research results also show that the perception of risk and cost are two major barriers to adopting mobile shopping. Therefore, the more we understand these two barrier factors, the better we promote the development of mobile shopping. One possibility to attain a deeper and broader understanding of risk and cost is to treat them as multi-dimensional constructs. Risk could be conceptualized and operationalized as security and privacy risks (Thakur and Srivastava, 2014), while cost includes financial risk, performance risk, time-lost risk, psychological risk and source risk (Ibrahim *et al.*, 2014). Such a view may provide a more comprehensive understanding of risk and cost.

The results indicate that affective and cognitive promotion factors have significant impacts on consumer intention, which consolidate the understanding that both individual effect and cognition have influence on consumer behavior (Bagozzi *et al.*, 1999). Also, it could be concluded that examining and investigating the adoption of mobile services (e.g. mobile shopping) is needed to integrate other variables that are different from well-established technological factors (Gerpott and Thomas, 2014; Zhang *et al.*, 2012). Furthermore, this study contributes by investigating how promotion and barrier factors serve as important antecedents to better explain mobile shopping (i.e. higher level of variance explained) in addition to attitude and the subjective norm. As such, it is necessary to consider both facilitator and inhibitor factors in a single research model to develop a more comprehensive knowledge of how and why drivers and barriers explain and predict mobile shopping.

To sum up, this study reinforces the theory of the factors affecting the intention to use mobile shopping through the integration of new factors into the TRA model in order to form an applicable model for Vietnam.

#### *Managerial implications*

From a practical perspective, managers and marketers of businesses who have the intention to join mobile shopping market could benefit from the result of this research.

First, the research results show that the intention to adopt mobile shopping is affected by both facilitator and barrier factors. These findings provide managers and marketers with a more comprehensive insight of their advantages and disadvantages when performing investment into mobile businesses. Therefore, the businesses should not only spend their resources on promoting drivers, but also allocate resources on weakening the barriers of mobile shopping.

Second, the research results also support managers and marketers to choose the main drivers to be consolidated and main barriers to be weakened in each group of factors (i.e. facilitator vs inhibitor). As such, they can invest their resources on the most important factors based on the magnitude of their impact on mobile shopping intention. Furthermore, the findings also suggest that managers and marketers should consider both affective and cognitive components of promotion factors. In the present study, trust (i.e. cognition) and attitude (i.e. affect) have the strongest and most positive effects on consumers' intentions to adopt mobile shopping, while perceived risk and cost are two considerable barriers these intentions. Hence, business managers and marketers should develop solutions to inhibit the perception of high risk and cost by, for example, emphasizing the great values of this new shopping trend since perceived values could be a counterbalance of negative perception (Kuo and Yen, 2009). Also, this enhances consumer trust in mobile shopping as well as attitude toward this new kind of shopping experience (Sweeney and Soutar, 2001).

Third, the results show that subjective norm has a positive effect on mobile shopping intention. In the context of the current study, the consumer perception of the subjective norm can be influenced by peers, family and media. Based on these groups, managers and marketers are suggested to develop marketing strategies for each group to maximize their influence on consumers. For example, managers and marketers of mobile shopping should utilize the mass media influence in creating a generally favorable environment for the adoption of mobile shopping, putting social pressure on an individual to adopt it sooner, rather than later (Khalifa *et al.*, 2012).

Finally, self-efficacy is a characteristic that managers need to keep in mind when building up a mobile shopping system. Such a system must be easy to access, browsing should be comfortable and processing (especially payment) should be simple (Compeau and Higgins, 1995). Furthermore, the mobile shopping system should also include a user manual and frequently asked questions section in order to support consumers in some complicated situations. A trial period is also a useful feature that should be integrated to help consumers gain confidence in mobile shopping systems.

#### *Limitations and future research directions*

This study has some limitations. First, although this study shows that trust and perceived risk have the strongest impacts on the intention to adopt mobile shopping, it does not examine their antecedents. Previous studies have stressed the importance of examining drivers of trust and risk (Coulter *et al.*, 2012; Kim *et al.*, 2008; Lin *et al.*, 2013; Pavlou, 2003). The consideration of these antecedents would benefit both scholars and practitioners in terms of providing a better understanding of how trust and risk are formed and consolidated, thereby proposing more effective solutions for the development of mobile shopping (Lin *et al.*, 2013). Thus, we recommend that future studies should integrate antecedences of trust and risk to attain this better understanding. Second, the intention to adopt is a self-reported variable which is used extensively in consumer behavior science. However, using this variable may lead to faulty conclusions, as intention may differ significantly from actual behavior. Hence, we suggest that future research should also cover actual use. In addition, the sample for this study was collected in one single province only. The results of this study would be more globally applicable if the sampling scope was expanded.

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