Do consumers want mobile commerce? A closer look at M-shopping and technology adoption in Malaysia

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Abstract
Purpose – Mobile shopping is expected to emerge as a new way of shopping as the Asia Pacific region moves towards the digital era. It is important to understand factors that influence consumers’ intentions to adopt this new shopping channel, especially in developing countries such as Malaysia where it has the fastest growing mobile penetration rate in the world. The purpose of this paper is to integrate the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB), and includes additional variables such as personal innovativeness (PI) and trust.

Design/methodology/approach – Empirical data from 453 consumers were tested against a proposed model using partial least squares structural equation modelling.

Findings – Findings suggest that most of the constructs in the model (i.e. trust, perceived ease of use, perceived usefulness, attitudes, PI and perceived behavioural control) influence a shopper’s intentions towards adopting mobile shopping. For example, consumers’ attitudes towards M-shopping adoption is higher if a system is not complex and easy to use; if consumers can easily pull out their mobile devices from their pockets to browse or shop by using just one finger, without a complicated process, they tend to use M-shopping channels. In addition, when mobile technology is user-friendly and free from mental effort, it creates positive perceptions that the system is useful, developing stronger intentions for consumers to adopt this alternative.

Originality/value – Since M-shopping is a personalised activity that involves money transactions, consumers are more cautious with adoption intentions, and do not follow social norms blindly. Thus, the empirical evidence from Malaysian consumers contributes to literature with insights into their specific m-shopping behaviour in this emerging market. In addition, from a theoretical perspective, the research model in this study integrates both TAM and TPB to provide a holistic view of consumers’ M-shopping adoption intentions in an emerging market, incorporating user-centric factors (i.e. trust and PI). An important finding which differs from other studies is that the relationship between subjective norms and behavioural intention to use M-shopping was not significant, which is contrary to the findings of previous studies. Moreover, attitude was found to mediate the effect of PEOU and PU on consumer’s intention towards mobile shopping adoption. The validated instrument would serve as a useful guideline for researchers during development and refinement of studies on M-shopping.

Keywords Malaysia, Innovation, Mobile commerce, M-shopping, Technology adoption, Mobile shopping

1. Introduction
Mobility has become the new way to drive innovation (Hou et al., 2016). Today, we see extensive developments of new services, such as mobile commerce, mobile social networking and digital content with the advancement of smartphones and tablets, and growing broadband network supplication (Phonthanukitithaworn et al., 2016). Rapid technology migration to mobile has redefined consumers’ experiences with various aspects
of daily life, creating new business opportunities across markets (Chao et al., 2013). To seize the advantages of the new digital ecosystem, retail industries have attempted to capitalise on mobile channels to serve and connect with customers better. In congruence, various mobile channels have been introduced in markets such as mobile banking, mobile payments and mobile shopping (Liesse, 2007). Statistics suggest that the world is experiencing rapid growth in the mobile industry, with 3.6 billion mobile subscribers at end of 2014 (GSMA Intelligence, 2015). Moreover, half of the world’s population already has mobile subscriptions, and the global penetration rate is expected to reach 60 per cent by 2020. Notably, the Asia Pacific region had an increase in mobile penetration, which was more significant in comparison to developed countries such as the USA and those in Europe that have already reached a mature stage (GSMA Intelligence, 2015). In Malaysia, the World Bank reports that the country recorded its highest penetration rate of 140 per cent, surpassing the penetration rate for the USA (Teller, 2014); in other words, every Malaysian citizen owns more than one mobile phone, on average.

Mobile shopping (M-shopping) has emerged as a new shopping channel for consumers in line with rapid technology migration towards mobile-mediated transactions. Deloitte Consulting estimates that USD$31bn worth of retail revenue will be transacted through mobile channels by 2016 (Brinker et al., 2012). The ubiquity of M-shopping enables shopping at any time and in any place, reshaping consumer experiences entirely in comparison to conventional shopping at brick-and-mortar stores. For example, consumers no longer need to be present at groceries stores to search for items to purchase, and they save time by not having to queue to pay for them. Consumers make purchases easily with mobile devices at any time and in any place, according to personal convenience. Prices offered through M-shopping are also lower than those found in conventional stores due to lower transaction costs (Wong et al., 2014). Thus, consumers enjoy savings not only financially, but also in terms of time spent shopping, and the flexibility to shop according to personal preferences. Hence, the importance of M-shopping cannot be understated.

Despite many advantages of M-shopping, use remains low in Malaysia, and Malaysian consumers’ attitudes towards this channel remain unclear. This study investigates factors that influence consumers’ intentions to adopt M-shopping. A few studies predict consumers’ intentions to adopt M-shopping, but there is no clear understanding of which factors affect adoption intentions in the context of an emerging economy such as Malaysia. Extant research focusses on the Technology Acceptance Model (TAM) and Theory of Planned Behaviour (TPB) models to explore consumer behavioural intentions (BI) regarding M-shopping (Gao et al., 2015; Kim et al., 2015; Wang et al., 2015; Yang, 2012; Qi et al., 2009), and various constructs such as compatibility, convenient, connectivity, perceived enjoyment, facilitating conditions, perceived risks and trust were added to the models to increase predictive power (Wong et al., 2014; Yang, 2010). Consequently, interesting findings have emerged from these studies. For example, some studies suggest that although consumers have positive attitudes towards various mobile activities such as mobile couponing, advertising, media, and social media, the majority does not possess positive attitudes towards M-shopping (Celik, 2016; Rao et al., 2011; Xu et al., 2009; Barutcu, 2008). Trust and personal innovativeness (PI) have been used broadly in a few studies, to extend TAM when studying consumer behaviours concerning mobile commerce such as mobile banking and payments, but have received less attention in M-shopping literature (Duane et al., 2014; Liébana-Cabanillas et al., 2014; Gu et al., 2009; Lee et al., 2012; Yang and Jolly, 2006). Thus, this study integrates TAM and TPB with PI and trust into a framework to study M-shopping adoption intentions among Malaysian consumers.

This paper contributes to mobile literature variously, both theoretically and practically. It advances a conceptual model that explores factors that affect consumers’ intentions towards M-shopping in the Malaysian context. This study combines several factors that
have been identified and tested empirically in extant research on e-commerce, M-commerce, online shopping and mobile payments, which include trust, attitude (ATT), perceived ease of use (PEOU), perceived usefulness (PU), PI, perceived behavioural control (PBC) and subjective norm (SN), to investigate their influence on the willingness of Malaysian consumers to use smartphones during M-shopping. An understanding of these factors will have significant implications for M-shopping service providers when developing more sophisticated features, services, and applications that meet consumers’ expectations, guiding M-shopping deployment strategies, information and marketing campaigns. It will also help M-shopping service providers with building positive relationships with customers in an M-commerce environment. Academically, additional knowledge about factors that influence consumers’ intentions to adopt M-shopping in an emerging economy will help researchers develop richer theoretical models.

2. Literature review

2.1 Mobile shopping

M-shopping occurs when any purchase-related activities are conducted using mobile devices such as smartphones or tablets through mobile internet (Groß, 2015; Wang et al., 2015; Ko et al., 2009). Consumer preferences for online shopping are shifting to mobile shopping channels, and it has become popular for contemporary consumers to order and pay for products using mobile device (Ahmad, 2013; Yang and Forney, 2013; Hung et al., 2012). Transactions performed through M-shopping include purchasing consumer goods and retail items, and payments for services such as hotel and airline ticket booking (Ozok and Wei, 2010). The advantages of M-shopping such as ubiquity, convenience, mobility, flexibility, personalisation, and dissemination have transformed conventional shopping experiences from brick-and-mortar stores to a new level of shopping, during which consumers are able to shop at any time and in any location according to their preferences with only one touch on their mobile devices (Wong et al., 2014; Wu and Wang, 2005). This new shopping trend has been recognised as a new business opportunity, and has garnered attention from many retailers. For example, the largest Chinese online company, Taobao and eBay from the USA have introduced mobile services to allow users to shop through mobile phones (Gao et al., 2015).

2.2 Technology acceptance model and theory of planned behaviour

TPB is arguably the pre-eminent model which relates consumer attitudes to decisions. It is designed “to predict and explain human behaviour in specific contexts” (Ajzen, 1991, p. 181). Ajzen extended the theory of reasoned action (TRA), by adding a new variable “perceived behavioural control”, to attitudes and subjective norms (the TRA constructs). Perceived behavioural control refers to the degree to which a person believes that they control any given behaviour. TPB is based on the assumption that consumers’ behaviours are guided, primarily, by their BI, which is determined jointly by PBC, SN and attitudes (Venkatesh et al., 2003). The theory has been used to explain behaviours such as consumption of certain diets, regular exercising, condom use, etc. (Ajzen, 2002). Researchers have also adopted this model to explain individual acceptance and use of IT such as mobile services, advertising and shopping as well (Noor et al., 2013; Yang, 2012; Sun et al., 2010).

On the other hand, the TAM has been popular in recent decades when studying adoption decisions regarding information technology (IT) (Chong and Shi, 2015). According to TAM, IT use depends on attitudes towards innovations, which in turn affect intentions to use them. The rationale behind TAM is that individuals react rationally when they want to adopt new IT by relating intention decisions to PEOU and PU (Venkatesh et al., 2012). If M-shopping is easy to use and results in positive performance, consumers will have positive attitudes towards adoption of and intentions to use it in the future (Davis, 1993).
It has been used broadly in many empirical studies to predict consumers’ intentions in varying contexts such as the internet and mobile commerce, banking, and payment adoption (Agrebì and Jallais, 2015; Liao et al., 2007; Bruner and Kumar, 2005; Wu and Wang, 2005; Luarn and Lin, 2005; Van der Heijden et al., 2003; Moon and Kim, 2001; Igbaria et al., 1997; Taylor and Todd, 1995; Davis, 1989). A more recent paper used an extended TAM to examine the adoption of wearable technologies (Chuah et al., 2016).

Despite broad use of TAM during research on IT adoption, some researchers have criticised it for offering only general information on an individual’s opinions of novel technology, without considering individual characteristics, and assuming use is volitional without constraints (Agarwal and Prasad, 1999; McMaster and Wastell, 2005). Therefore, it has been recommended that more variables should be integrated into TAM to increase its explanatory power (Hu et al., 1999). In literature, a few extended TAM models have been proposed.

Ajzen (1985) proposed extending TAM with constructs from TPB to predict consumer behaviours across various IT systems. Since M-shopping relates closely to mobile commerce and payments, it is an appropriate model to investigate consumers’ intentions towards M-shopping. A few attempts have been made to integrate the two models with other variables. For example, Mun et al. (2006) developed a model integrating TAM, TPB and innovation diffusion theory to understand IT acceptance by professionals. Another study in Singapore used TAM with PU, PEOU and attitudes to examine factors that affect mobile commerce adoption (Yang, 2005). Thus, incorporating variables from TPB into TAM is expected to provide a comprehensive understanding of consumer adoption intentions of M-shopping.

In the context of mobile payment, few other studies have used modified TAM models. For example, Kim and Lee used an extended TAM model to examine intention to use mobile payment. However, their study did not examine the effects of trust, attitudes or SN constructs. Moreover, in their conceptual model, they examined the effect of innovativeness on PEOU but not the direct effect on intention. Schierz et al. (2010) also used another extended TAM model to explain consumer acceptance of mobile payment services. Their study looked at the relationship between SN and attitudes but did not examine the effect of SN on intention. On the other hand, Yang et al. (2012) used a construct called social influences, made up of SNs and image. A few other studies have extended TAM using trust and PI to predict the acceptance of M-commerce and mobile payments in various contexts (Sellitto, 2015; O’Reilly et al., 2012; Wu and Wang, 2005). Thus, the current conceptual model integrates the original TAM and TPB models, with additional constructs of trust and PI to examine Malaysian consumers’ intentions to use M-shopping (refer to Figure 1).

3. Hypotheses and research model development

3.1 Trust

Trust is a subjective belief that a party will fulfil its obligations in a situation in which a trustor is subject to higher uncertainty and greater risk of loss of control (Lu et al., 2011; Zhou, 2013). Many extant studies identify trust as a determinant of BI in information system (Lee et al., 2015; Luo et al., 2010; Lin and Wang, 2006). In an M-shopping context, trust represents a retailer’s attitudes towards keeping a customer’s interest in mind, rather than self-benefitting, and can be measured using the availability of a vendor’s skills and abilities to fulfil its tasks, and its ability to keep promises and not deceive its customers. The common perception of distrust towards M-commerce is due primarily to distrust of mobile vendors and mobile payment systems themselves, where there is doubt of product quality since purchases are performed without visual inspection of tangible products. M-shopping appears to involve greater risk and uncertainty due to vulnerability of mobile networks in comparison to online shopping (Chen, 2013; Chen and Lan, 2014; Morosan, 2014; Zhou, 2013). Mobile shoppers are also concerned about security and privacy issue such as
potential disclosure of credit card accounts and password information to unauthorised parties (San-Martín et al., 2013). Thus, perceived risk and security issues influence the trust of mobile shoppers, and affects their intentions to engage in M-shopping. Research suggests that lack of trust is a primary reason that prohibits consumers from shopping online and performing electronic transactions (Liu et al., 2005). Many studies of electronic and mobile commerce suggest that trust correlates with BI, and is a necessary component of adoption behaviours (Kim et al., 2008; Tsu Wei et al., 2009; Wang et al., 2006; Zhang et al., 2012). Hung et al. (2012) use trust as a determinant of M-shopping continuance in Taiwan. Reflecting increasing importance of trust regarding many IT acceptances, we integrate trust into a model to examine Malaysian consumers’ M-shopping intentions. Thus:

H1. Trust positively influence consumers’ intention to adopt mobile shopping.

3.2 Perceived ease of use
PEOU represents the degree to which a person believes that using a system is free from physical and mental effort (Davis, 1989; Van der Heijden et al., 2003); it reflects effort involved in learning and using technology, and is a contributor to acceptance of new technologies (Moore and Benbasat, 1991). Davis (1989) explain that PEOU contributes to consumers’ attitudes through self-efficacy and instrumentality. Self-efficacy is a primary factor of intrinsic motivation towards behaviours, while instrumentality refers to the improvement in PEOU that contributes to increased performance through usefulness (Liébana-Cabanillas et al., 2014; Wang et al., 2003). Consumers are more likely to adopt a new system when they perceive it is easy to learn and use (Piikkarainen et al., 2004). Extant research indicates that PEOU has been used to study acceptance of IT such as
mobile payments (Kim et al., 2010; Schierz et al., 2010), commerce (Yang, 2005) and shopping (Wong et al., 2012). Attitudes (ATT) are defined as behavioural beliefs about technology adoption, and represent consumers’ positive or negative feelings about engaging in a behaviour (Ajzen and Fishbein, 1980). Therefore, it is highly likely that PEOU would also influence attitudes towards M-shopping in Malaysia:

\[ H2. \text{PEOU positively influence consumers’ attitude towards mobile shopping.} \]

3.3 Perceived usefulness

PU is a subjective perception that a technology is useful, which can enhance job performance (Davis, 1989; Ven der Heijden et al., 2003). Research suggests that an individual is more likely to accept new technology if he/she perceives that the activities associated with it will deliver better performance (Mallat, 2007; Vijayasarathy, 2004). For example, Chuah et al. (2016) showed that usefulness was one of the main drivers of smartwatch adoption. An online survey in Korea that examined M-internet adoption intentions, and another study on e-learning acceptance in a high-tech firm, found strong, positive effects of PU on BI (Ho Cheong and Park, 2005; Ong et al., 2004). When consumers perceive that M-shopping helps with their overall shopping experience as they are not being constrained by physical location and time, the perception is expected to generate positive feelings towards M-shopping. Since the literature consistently suggests a positive relationship between PU and consumers’ attitudes towards IT, we hypothesise:

\[ H3. \text{PU positively influence consumers’ attitude towards mobile shopping.} \]

PU is also influenced by PEOU because any new technology is perceived as more useful if it is easier to use (Venkatesh and Davis, 2000). Easy access to M-shopping sites from one’s own mobile device would assist consumers with achieving shopping goals (Yang, 2010). A user-friendly M-shopping site makes consumers perceive M-shopping as useful, enhancing their shopping experience (Yang, 2010). Several studies provide empirical support for a positive relationship between PEOU and PU, and their influence on ATT during new IT adoption (Chen, 2008; Kim et al., 2010; Van der Heijden et al., 2003; Wang et al., 2003). Therefore it is hypothesised that:

\[ H4. \text{PEOU positively influence PU of mobile shopping.} \]

3.4 Attitudes

A positive relationship between attitudes and intentions to use new technology has been validated in many extant studies, where PEOU and PU are antecedents to determining consumers’ attitudes towards adoption (Kang et al., 2006; Bauer et al., 2005; Yang and Yoo, 2004; Ajzen and Fishbein, 1980). Yang (2012) showed that attitudes are a strong determinant in a study of consumer technology traits during M-shopping adoption. Therefore, it is also highly likely that consumers’ intention to adopt mobile shopping are positively and directly influenced by attitudes towards M-shopping:

\[ H5. \text{Consumers’ attitudes positively influence intention to adopt mobile shopping.} \]

3.5 Personal innovativeness

PI represents a consumer’s willingness to try new IT (Agarwal and Prasad, 1998). Individuals with the PI trait are capable of handling high improbability, and can cope with uncertainty better since they are more willing to accept new technology (Rogers, 1995). Innovative consumers perceive fewer dangers while exploring and seeking new ideas (Joseph and Vyas, 1984; Lu et al., 2003). Such consumers are more willing to welcome
opportunities to use M-shopping as a new shopping channel. These consumers, who usually represent early adopters of innovation, often become sources of opinions on innovation among peers (Duane et al., 2014). PI has been used to predict consumer adoption of internet shopping in many extant studies (Varma Citrin et al., 2000). PI affects internet shopping behaviours both directly and indirectly through consumers’ attitudes and intentions (Limayen et al., 2000). Tan et al. (2014) and Slade et al. (2013) found that PI predicts mobile payment adoption intentions positively in Malaysia and the UK, respectively. Pagani (2004) suggests that consumers’ PI influences attitudes towards mobile services acceptance. In a recent study on consumer acceptance of mobile services, Zarmpou et al. (2012) found that PI has the strongest effect on consumers’ BI. Thus:

**H6.** PI positively influence consumers’ intention to adopt mobile shopping.

### 3.6 Subjective norms

SN are normative beliefs influenced by social pressures regarding decisions to adopt new technology (Young and Kent, 1985). In the context of this study, SN are defined as an individual’s perceptions that most of the people who are important to him/her think that he/she should or should not shop using mobile phone (Fishbein and Ajzen, 1975; Venkatesh and Davis, 2000). One study of mobile service adoption intentions in Norway suggests that SN are strong determinants of adoption behaviours due to normative pressures from superiors and friends (Nysveen et al., 2005). Wong et al. (2012) found that SN have the strongest influence on BI when adopting mobile learning in Malaysia. A recent study of mobile payment service adoption corroborates that SN influence Thai consumers’ adoption intentions (Sellitto, 2015). Bauer et al. (2005) and Khan and Allil (2010) found similar results, suggesting SN are determinants of consumers’ intentions to adopt mobile advertising. Socialisation forces associated with a desire to follow referent group norms frequently influence consumers’ adoption of new technology, and thus SN direct group members to engage in expected behaviours (Kim et al., 2011; Kulviwat et al., 2009). Researchers have also observed that consumers recommend products to others when they are satisfied, and referent group suggestions represent credible sources that influence consumers’ adoption intentions (Yang, 2012). Yang et al. (2012) also showed that the intention to adopt mobile payment services was directly and positively affected by social influences, made up of SNs and image. Individuals follow normative beliefs when adopting new IT, so:

**H7.** SNs positively influence consumers’ intention to adopt mobile shopping.

### 3.7 Perceived behavioural control

PBC is an individual’s belief that he/she has control over behaviours (Ajzen, 1985), including perceptions of performing some behaviours easily like using resources and knowledge to use technology (Taylor and Todd, 1995). When consumers perceive that they have the capability to control a task’s process, positive feelings boost their confidence about outcomes, increasing acceptance of new technology (Bateson and Hui, 1987). When consumers perceive lack of control when using new technology, negative feelings reduce acceptance (Hoffman et al., 1999). During M-shopping, PBC represents the extent to which consumers possess sufficient knowledge and infrastructure, including availability of a smartphone, mobile internet, and service capability, to support M-shopping transactions and use (Yang, 2012). According to Nysveen et al. (2005), PBC has a positive relationship with intentions to use mobile services, regardless of gender and age. PBC has also been found empirically to have a significant relationship with consumers’ intentions towards acceptance of mobile text-messaging advertisements (Beneke et al., 2010). Extant research
on consumer technology traits to determine M-shopping adoption corroborates that PBC correlates positively with consumers’ BI (Yang, 2012). Thus:

\[ H8. \text{ PBC positively influence consumers' intention to adopt mobile shopping.} \]

4. Methodology

Partial least squares structural equation modelling (PLS-SEM) was used to test the hypotheses, and validity and reliability of the measures, using Smart PLS 3.0. PLS-SEM is a variance-based, linear model that does not require data normality, and allows simultaneous exploration of both measurement and structural models (Hair et al., 2014; Teo et al., 2015). The method was selected because it allows simultaneous analysis of all relationship in the research model by combining multiple regression and factor analysis, and allows both observed and latent variables (LV) to be analysed concurrently to assess overall statistical fit (Mathieu and Taylor, 2006; Tabachnick and Fidell, 2007). Extant research suggests that PLS-SEM is appropriate for theory testing during early stages of development, and is suitable for handling complex models with large data sets (Fornell and Bookstein, 1982). Since M-shopping is a new extension of IT, and multiple variables were integrated into a model, PLS-SEM is a suitable analytical tool to examine the relationships and significance of each variable. We first explore measurement of an outer model, relating measurement variables to LV, followed by analysis of an inner (structural) model, relating LVs to each other (Chatelin et al., 2002; Henseler and Fassott, 2010; Tenenhaus et al., 2005).

4.1 Data collection

Prior to the survey, a pre-test was conducted on ten randomly selected participants to examine the clarity of statements/items on the questionnaire. Only minor changes were made due to spelling errors, following careful consideration. Non-probability convenience sampling was employed, and the survey was administered over 12 weeks by visiting universities for distribution of paper surveys, and e-mail-surveys from December 2015 through February 2016. Target respondents were young working adults and university students since young people represent the largest mobile device user group in Malaysia, according to a study from Malaysian Communications and Multimedia Commission (Wong et al., 2014). In total, 525 respondents participated in the survey, with 453 completed and valid responses, a response rate of 86.3 per cent.

The first section of the survey included a pre-screening question to investigate respondents’ experiences with M-shopping. To ensure perceptions were based on direct behavioural experiences with the object, only respondents who had previously used M-shopping were included during analysis. The second section included 33 items to measure various factors that affect M-shopping intentions (i.e. Trust, PEOU, PU, ATT, PI, SN, PBC and INT). All items exhibited high internal consistency, and were validated in previous studies. The respective sources of extant literature are listed in Table I, and scale items used were modified for testing in an M-shopping context. All constructs were measured using a seven-point Likert-type scale, ranging from strongly disagree (1) to strongly agree (7). The last section pertained to participant demographics. Respondents’ attributes are described in Table I.

4.2 Data analysis

4.2.1 Respondent profile. Demographic profiles for respondents presented in Table II indicate that 40.8 per cent were male 59.2 per cent female. The majority (70.6 per cent) was between 22 and 33 years old. About 62.3 per cent were single and 36.4 per cent married. In terms of academic qualifications, about 82.5 per cent held Bachelor’s degrees or above,
<table>
<thead>
<tr>
<th>Constructs</th>
<th>Items</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trust</td>
<td>Trust1: M-shopping vendor is trustworthy</td>
<td>Lee (2005), Pavlou (2002)</td>
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<td></td>
<td>Trust2: M-shopping vendor keep their promises and commitment</td>
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<td>Trust3: M-shopping keep customer’s interest in mind</td>
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<td>Trust4: M-shopping is responsible</td>
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<td></td>
<td>Trust5: In general, I trust M-shopping</td>
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<tr>
<td>Perceived ease of use</td>
<td>PEOU1: Learning to use M-shopping is easy for me</td>
<td>Davis (1989), Venkatesh and Bala (2008)</td>
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<td></td>
<td>PEOU2: Using M-shopping do not required mental effort</td>
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<td></td>
<td>PEOU3: Making purchase of what I want through M-shopping is easy</td>
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<td>PEOU4: It is easy to use M-shopping in the way that I want it to do</td>
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<td>PEOU5: My interaction with M-shopping is clear and understandable</td>
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<td>Perceived usefulness</td>
<td>PU1: Using M-shopping help me accomplished my purchase more quickly</td>
<td>Davis (1989)</td>
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<td>PU2: Using M-shopping make my life easier</td>
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<td>PU3: Using M-shopping increase efficiency of making my purchase</td>
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<td></td>
<td>PU4: In general, using M-shopping is useful for me to make purchase</td>
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<tr>
<td>Attitude</td>
<td>ATT1: Using M-shopping is a good idea</td>
<td>Goldsmith (2002), Shih and Fang (2004), Nysveen et al. (2005)</td>
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<td>ATT2: Using M-shopping is wise</td>
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<td></td>
<td>ATT3: Using M-shopping is beneficial</td>
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<td>ATT4: I feel positive about shopping using mobile devices</td>
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<td></td>
<td>ATT5: Generally I am favourable towards M-shopping</td>
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<tr>
<td>Personal innovativeness</td>
<td>PI1: I am curious about M-shopping</td>
<td>Agarwal and Prasad (1998), Goldsmith and Flynn</td>
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<td>PI2: I would like to try my purchase of products or services using M-shopping</td>
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<td>PI3: I am the first to explore M-shopping among my peers</td>
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<td>PI4: Generally, I would like to accept the idea of purchase through M-shopping</td>
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<td>Subjective norm</td>
<td>SN1: People who are important to me would recommend to use M-shopping</td>
<td>Venkatesh et al. (2003), Tan et al. (2012), Taylor and Todd (1995)</td>
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<td></td>
<td>SN2: People who are important to me would find using M-shopping is beneficial</td>
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<td></td>
<td>SN3: People who are important to me would find using M-shopping is a good idea</td>
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<td></td>
<td>SN4: People who are important to me think that I should use M-shopping</td>
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<td>Perceived behavioural control</td>
<td>PBC1: I have mobile device with internet access for shopping</td>
<td>Ajzen (1991), Taylor and Todd (1995)</td>
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<td></td>
<td>PBC2: I would make purchase using mobile device given the available resources and opportunity</td>
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<td></td>
<td>PBC3: It would be easy for me to use mobile device for shopping</td>
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<td>Intention</td>
<td>INT1: I intend to use M-shopping in next few months</td>
<td>Venkatesh et al. (2012)</td>
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<td></td>
<td>INT2: I predict that I would use M-shopping in next few months</td>
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<td>INT3: I plan to use M-shopping in next few months</td>
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Notes: ATT, attitude; INT, intention; PBC, perceived behavioural control; PEOU, perceived ease of use; PI, personal innovativeness; PU, perceived usefulness; SN, subjective norm
and the remaining 17.5 per cent held a diploma, certificate, or lower. Classifying monthly incomes, about 67.5 per cent were earning RM2,001 to RM8,000 per month, and 11.3 per cent more than RM8,001. In total, 450 (99.7 per cent) owned a smartphone, and 75.1 per cent had experience with M-shopping. Various ranges of products were acquired through M-shopping, including movie tickets (62.5 per cent), airline tickets (45.7 per cent), fashion and accessories (39.7 per cent), online-coupons and vouchers (34.9 per cent), electronic gadgets (20.1 per cent), personal care and perfume products (12.4 per cent), books (11.9 per cent) and baby and children’s products (6.6 per cent).

4.2.2 Reliability. The first criterion used to assess the measurement model was reliability. It is possible to assess internal consistency through Cronbach’s $\alpha$ or composite reliability, but Barclay et al. (1995) suggests that composite reliability is more appropriate since it is not influenced by the number of items in each scale, and uses item loadings extracted from the causal model. A value greater than 0.7 is satisfactory for both methods (Bagozzi, 1994; Nunnally, 1978). Table III shows reliability test results, where Cronbach’s $\alpha$ and composite reliabilities both had values greater than 0.9, indicating that the measurement model was reliable.

Individual reliability of the indicators was measured using expectation of LV variance, which should explain at least 50 per cent of the indicator’s variability (Hair et al., 2014). Hair et al. (2014) suggest that outer loadings of manifest variables should be greater than 0.708. Factor loadings are shown in Table III, where all indicators loaded greater than 0.708. Based on the two tests, the indicators were reliable.
4.2.3 Validity. During statistical analysis, construct validity can be measured using convergent and discriminant validity. The first criterion for a validity test is to examine the convergent validity; the construct must produce the same outcome regardless of the use of various approaches (Leong et al., 2013). In PLS-SEM, average variance extracted (AVE) is a common method to test convergent validity. Table IV shows AVEs for all constructs. All values were greater than 0.5, indicating that each LV explained more than 50 per cent of their respective indicator’s variance, on average, and suggesting sufficient convergent validity (Bagozzi, 1994; Hair et al., 2012). The second criterion for construct validity is assessed through discriminant validity, which examines patterns of indicators for a construct in comparison to another construct’s indicators.

Two approaches were used to assess the constructs’ discriminant validity. First, the patterns of indicators’ outer loadings with cross-loadings on other indicators were examined. If outer loadings of a construct are higher than cross-loadings with all other constructs, discriminant validity is present. Results demonstrate that the indicators for each construct had higher loadings on their own constructs than on any others, suggesting discriminant validity.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Items</th>
<th>Loading</th>
<th>( \alpha )</th>
<th>CR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude</td>
<td>ATT1</td>
<td>0.913</td>
<td>0.949</td>
<td>0.961</td>
</tr>
<tr>
<td></td>
<td>ATT2</td>
<td>0.902</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ATT3</td>
<td>0.898</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ATT4</td>
<td>0.931</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>ATT5</td>
<td>0.916</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intention</td>
<td>INT1</td>
<td>0.955</td>
<td>0.944</td>
<td>0.964</td>
</tr>
<tr>
<td></td>
<td>INT2</td>
<td>0.966</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>INT3</td>
<td>0.924</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived behavioural control</td>
<td>PBC1</td>
<td>0.922</td>
<td>0.905</td>
<td>0.940</td>
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<tr>
<td></td>
<td>PBC2</td>
<td>0.938</td>
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<td></td>
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<tr>
<td></td>
<td>PBC3</td>
<td>0.888</td>
<td></td>
<td></td>
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<tr>
<td>Perceived ease of use</td>
<td>PEOU1</td>
<td>0.862</td>
<td>0.918</td>
<td>0.939</td>
</tr>
<tr>
<td></td>
<td>PEOU2</td>
<td>0.740</td>
<td></td>
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<tr>
<td></td>
<td>PEOU3</td>
<td>0.916</td>
<td></td>
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<tr>
<td></td>
<td>PEOU4</td>
<td>0.908</td>
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<td></td>
<td>PEOU5</td>
<td>0.906</td>
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<tr>
<td>Personal innovativeness</td>
<td>PI1</td>
<td>0.723</td>
<td>0.858</td>
<td>0.903</td>
</tr>
<tr>
<td></td>
<td>PI2</td>
<td>0.873</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>PI3</td>
<td>0.855</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>PI4</td>
<td>0.889</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perceived usefulness</td>
<td>PU1</td>
<td>0.926</td>
<td>0.943</td>
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<tr>
<td></td>
<td>PU2</td>
<td>0.930</td>
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<td>PU3</td>
<td>0.924</td>
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<td></td>
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<tr>
<td></td>
<td>PU4</td>
<td>0.918</td>
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<td></td>
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<tr>
<td>Subjective norm</td>
<td>SN1</td>
<td>0.930</td>
<td>0.943</td>
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<td></td>
<td>SN2</td>
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<td></td>
<td>SN3</td>
<td>0.941</td>
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<tr>
<td></td>
<td>SN4</td>
<td>0.888</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>Trust1</td>
<td>0.898</td>
<td>0.930</td>
<td>0.947</td>
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<tr>
<td></td>
<td>Trust2</td>
<td>0.900</td>
<td></td>
<td></td>
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<td></td>
<td>Trust3</td>
<td>0.832</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Trust4</td>
<td>0.902</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Trust5</td>
<td>0.887</td>
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<td></td>
</tr>
</tbody>
</table>

Notes: ATT, attitude; INT, intention; PBC, perceived behavioural control; PEOU, perceived ease of use; PI, personal innovativeness; PU, perceived usefulness; SN, subjective norm; \( \alpha \), Cronbach’s \( \alpha \); CR, composite reliability

Table III. Factor analysis
Henseler et al. (2015) propose a new approach – Heterotrait-Monotrait – to examine discriminant validity. The approach is a straightforward estimation of correlations between constructs, which parallels dis-attenuated construct correlation. Table V shows that all constructs had correlation values less than the threshold of 0.85, and thus discriminant validity was likely (Henseler et al., 2015). In summary, the model demonstrated adequate reliability, and convergent and discriminant validity.

### 4.2.4 Structural model analysis

A hypothesis model was tested using structural equation modelling (refer to Figure 1). The central criterion to evaluating the structural model is total variance explained, or $R^2$ of the dependent variable. The $R^2$ of the model was 0.614, indicating that the model explained 61.4 per cent of the construct’s variance. Thus, M-shopping intentions were explained moderately by trust, PEOU, PU, ATT, PI and PBC (Chin, 1998; Hair et al., 2014). PEOU and PU jointly explained 58.4 per cent of the attitudes.

According to Müller and Gaudig (2010), a good practice for reporting the predictive validity of the research model is to report effect size ($f^2$) and predictive relevance ($Q^2$) besides explained variance ($R^2$). These are given below.

#### 4.2.5 Effect size, $f^2$

The study explores changes in $R^2$ to investigate the substantive influence of each independent construct on the dependent construct using the effect size ($f^2$) technique. Changes to $R^2$ were calculated by estimating the PLS path model twice, the first time with exogenous LV included, and a second time excluding the LV. The Effect Size $f^2$, is the change in $R^2$ value when a specified construct is omitted from the model and is used to evaluate the impact of the excluded variables (ATT, PBC, PI, SN and Trust) on the endogenous construct (INT). Table VI presents a summary of results on the effect size test. Cohen (1988) proposes guideline to access $f^2$, where values of 0.02, 0.15 and 0.35 represent small, medium and large effects, respectively while effect size values lower than 0.02

<table>
<thead>
<tr>
<th>Construct</th>
<th>ATT</th>
<th>INT</th>
<th>PBC</th>
<th>PEOU</th>
<th>PI</th>
<th>PU</th>
<th>SN</th>
<th>Trust</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INT</td>
<td>0.735</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>PBC</td>
<td>0.778</td>
<td>0.774</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PEOU</td>
<td>0.701</td>
<td>0.610</td>
<td>0.724</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>PI</td>
<td>0.827</td>
<td>0.714</td>
<td>0.746</td>
<td>0.580</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PU</td>
<td>0.794</td>
<td>0.680</td>
<td>0.772</td>
<td>0.812</td>
<td>0.703</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SN</td>
<td>0.690</td>
<td>0.588</td>
<td>0.648</td>
<td>0.508</td>
<td>0.683</td>
<td>0.568</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trust</td>
<td>0.713</td>
<td>0.671</td>
<td>0.656</td>
<td>0.671</td>
<td>0.662</td>
<td>0.681</td>
<td>0.566</td>
<td></td>
</tr>
</tbody>
</table>

**Table V.** HTMT test

Notes: ATT, attitude; INT, intention; PBC, perceived behavioural control; PEOU, perceived ease of use; PI, personal innovativeness; PU, perceived usefulness; SN, subjective norm; HTMT, Heterotrait-Monotrait
indicates that there is no effect. Thus, the results show that the effect size of PBC was considered as medium \( f^2 = 0.135 \), while all other variables, namely, attitudes, PI and trust – had a small effect \((0.026, 0.018, \text{and} 0.047, \text{respectively})\). This indicates that PBC had the biggest effect on INT among all the LV.

4.2.6 Predictive relevance \( Q^2 \). The Stone and Geisser \( Q^2 \) test is used to evaluate the predictive relevance of a structural model. \( Q^2 \) is calculated using the blindfolding procedure by the PLS software and reflects an index of goodness of reconstruction by model and parameter estimations. \( Q^2 \) values greater than zero indicate that the model has predictive relevance for a certain endogenous construct. On the other hand, values lower than 0 indicate lack of predictive relevance. Table VII shows Stone–Geisser’s \( Q^2 \) for the endogenous constructs are 0.485, 0.54 and 0.499 for Attitude, Intention and PU, respectively, indicating acceptable predictive relevance.

4.2.7 Hypotheses testing. The bootstrapping resampling technique in Smart PLS enables testing of the statistical significance of path coefficients. Evaluation of the structural model is illustrated in Figure 1, which shows that all path coefficients were significant. PEOU \((\beta = 0.21, \rho < 0.001)\) and PU \((\beta = 0.592, \rho < 0.001)\) had positive influences on consumers’ attitudes, supporting \( H2 \) and \( H3 \).

PBC had the strongest positive effect on consumers’ adoption intentions \((\beta = 0.357, \rho < 0.001)\), followed by trust \((\beta = 0.19, \rho < 0.05)\), ATT \((\beta = 0.183, \rho < 0.01)\), and PI \((\beta = 0.138, \rho < 0.05)\). Thus, \( H1, H5, H6 \) and \( H8 \) were supported. PEOU correlated with PU \((\beta = 0.765, \rho < 0.001)\) positively, supporting \( H3 \). However, there was no relationship between SN and BI, and thus \( H7 \) was not supported.

4.2.8 Analysis of mediating effect. The application of bootstrapping (5,000 resamples) allows testing for mediation (Hair et al., 2014) and results is showed in Table VIII. If the indirect effect of the relationship is significant when including mediator, the mediator absorbs some of the indirect effect. The variance accounted for (VAF) determines the size of the indirect effect in relation to total effect mediation, indicating the strength of mediation. Hair et al. (2014) suggested that VAF above 80 per cent can assume a full mediation, VAF in between 20 to 80 per cent represents partial mediation, while VAF less than 20 per cent indicates no mediation take place. When adding mediators, PEOU \((\beta = 0.099, t = 3.264, \rho < 0.001)\) had a positive influence on consumers’ attitudes, supporting \( H2 \) and \( H3 \).

| Construct | \( f^2 \) Effect | \( f^2 \) Effect |
|-----------|----------------||----------------|
| ATT       | 0.026 Small    | ATT, attitude  |
| PBC       | 0.135 Medium   | PBC, perceived |
| PI        | 0.018 Small    | behavioural   |
| SN        | 0.002 –        | control       |
| Trust     | 0.047 Small    | PI, personal   |
|           |                | innovativeness|

**Notes:** \( f^2 \), effect size; ATT, attitude; PBC, perceived behavioural control; PI, personal innovativeness; SN, subjective norm

| Construct | \( \sum_{SSO} \) | \( \sum_{SSE} \) | \( Q^2 \) |
|-----------|----------------||----------------||------|
| ATT       | 2,265.00       | 1,166.77       | 0.485|
| INT       | 1,359.00       | 629.485        | 0.54 |
| PU        | 1,812.00       | 906.983        | 0.499|

**Notes:** \( \sum_{SSO} \), sum of the squared observations; \( \sum_{SSE} \), sum of the squared prediction errors; \( Q^2 \), predictive relevance; ATT, attitude; INT, intention; PU, perceived usefulness

Table VI. Effect size test

Table VII. Blindfolding test for predictive relevance
5. Discussion

TAM and TPB were employed in this study to determine driving factors of M-shopping intentions in Malaysia. Along with PEOU, PU, and attitudes drawn from TAM, SN and PBC extracted from TPB, and additional constructs such as trust and PI, were added to the model to increase predictive power. Results suggest that all variables, excepting SN, predict M-shopping adoption intentions. Findings also show that PEOU and PU explain consumers’ attitudes towards M-shopping. Consumers’ attitudes towards M-shopping adoption is higher if a system is not complex and easy to use; if consumers can easily pull out their mobile devices from their pockets to browse or shop by using just one finger, without a complicated process, they tend to use M-shopping channels. PEOU was found to have a strong, positive relationship with PU. When mobile technology is user-friendly and free from mental effort, it creates positive perceptions that the system is useful, developing stronger intentions for consumers to adopt this alternative. This finding accords with many extant studies of IT; when consumers perceive that a system is easy to use, it helps them achieve their goals more easily, and hence increases adoption tendencies (Carlos Roca et al., 2009; Wong et al., 2014). Consumers intend to use M-shopping if they believe that using this alternative is useful, helping them increase gains during shopping by minimising shopping time, and receiving personalisation and preferred product information. Its characteristic of being personal and interactive, and offering the capability of communicating directly with retailers, is another advantage of M-shopping’s usefulness. The flexibility for consumers to access M-shopping at any time and in any location is an added advantage to the usefulness of the system, driving consumers’ intentions to adopt it. Findings accord with extant studies of M-shopping adoption in the USA, where both utilitarian and hedonic PU have positive relationships with consumers’ attitudes towards adoption (Yang, 2010). They are also consistent with findings from Lu and Su in a study of factors that influence purchasing intentions on M-shopping websites, where PU affected consumers’ purchasing intentions. Thus, perceptions of M-shopping as being a useful shopping channel play a role in determining adoption behaviours. Our results also show significant mediating role of ATT to PEOU and PU in the research model. Thus, attitude accounts for some, but not all, of the relationship between PEOU and PU, and consumer’s intention towards mobile M-shopping adoption.

Findings suggest that trust affects consumers’ intentions towards M-shopping adoption; it increases consumers’ perceived control and helps create positive perceptions of M-shopping, and indirectly increases confidence in M-shopping adoption. Consistent with extant studies on M-commerce adoption, trust affects consumers’ BI (Gu et al., 2009). Kim et al. (2008) argue that consumer trust has a strong, positive effect on purchasing intentions regarding electronic commerce in the USA. Current findings suggest that PI affects consumers’ intentions towards M-shopping adoption. A positive

<table>
<thead>
<tr>
<th></th>
<th>Direct effect</th>
<th>Indirect effect</th>
<th>Total effect</th>
<th>VAF (%)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEOU – ATT – INT</td>
<td>0.105*</td>
<td>0.099***</td>
<td>0.204***</td>
<td>48.50</td>
<td>Partial mediation</td>
</tr>
<tr>
<td>PU – ATT – INT</td>
<td>0.206***</td>
<td>0.28***</td>
<td>0.485***</td>
<td>57.70</td>
<td>Partial mediation</td>
</tr>
</tbody>
</table>

**Notes:** VAF, variance accounted for; PEOU, perceived ease of use; PU, perceived usefulness; ATT, attitude; INT, intention. *p < 0.10; **p < 0.05; ***p < 0.01 (two-tailed test)
relationship between PI and BI corroborates results in extant studies regarding various applications of technology acceptance (Goldsmith, 2000; Limayen et al., 2000; Varma Citrin et al., 2000). Aldás-Manzano et al. found that PI drives M-shopping acceptance among Spanish consumers. Consumers with the PI characteristic are more willing to accept M-shopping as a new channel of purchasing, making them sources of opinions for peers. A positive influence on adoption intentions has also been found in other IT studies, including those that assess mobile payments in Malaysia and the UK (Slade et al., 2013; Tan et al., 2014).

PBC was found to have a positive relationship with M-shopping intentions. The intention to use M-shopping increases when consumers perceive they have control over shopping using mobile devices. Findings accord with extant literature that examines consumers’ intentions towards mobile text-message advertisements (Beneke et al., 2010). They also agree with findings from Yang (2012) in a study of consumer technology traits during M-shopping adoption; when consumers perceive they have control over using mobile technology, anxiety reduces, enhancing intentions to use a system. One of the interesting results of this study was that the relationship between SN and consumers’ intentions towards M-shopping adoption was not significant. Influences through socialisation do not appear to affect consumers’ intentions to adopt M-shopping in Malaysia, contradicting a previous research on M-shopping adoption among young consumers in Malaysia (Wong et al., 2012), which suggested that SN has the strongest influence on adoption intentions. This is also quite different from the findings of Yang et al. (2012) which showed that social influences (in the form of SN and image) had a positive effect on the intention to adopt mobile payment services. The current findings might be due to the generalisation of mobile device use in Malaysia, where most of the respondents already owns mobile devices and had experience with M-shopping. Thus, opinions from others were less likely to affect adoption intentions in this context. Since M-shopping is a personalised activity that involves money transactions, consumers are more cautious with adoption intentions, and do not follow social norms blindly. Moreover, the finding is in line with that of Dishaw and Strong (1999) who indicated that SNs were not important in understanding individual choices to use IT. Another study in Malaysia looking at organic products using a modified TPB model, also found that SNs did not influence intention to re-purchase (Ghazali et al., 2017).

Finally, from a theoretical perspective, the research model in this study integrates TAM into TPB to provide a holistic view of consumers’ M-shopping adoption intentions in an emerging market, incorporating user-centric factors (trust and PI). The validated instrument is useful to serve as a guideline for researchers during development and refinement of M-shopping study.

6. Managerial implications

Results from this study provide valuable information on user behaviours regarding M-shopping adoption in Malaysia. M-shopping service providers can design and develop more sophisticated and effective M-shopping services based on the findings to deliver value to consumers and attract adoption. Since PEOU and PU had significant effect on consumers’ attitudes, M-shopping providers and marketers should emphasise user-friendly features on their shopping apps and ensure that all services and features on an M-shopping site or app are sufficiently easy to use through usability pretesting. A useful M-shopping website would help shoppers search for items quickly, providing them with full, detailed information about items and allowing them to accomplish efficient purchase transactions. It is important for M-shopping designers to examine the functionality and usability of mobile sites from customers’ perspectives, and provide M-shopping services that are easy to access and navigate.
Since PBC affects M-shopping intentions positively, developers should reduce the complexity of M-shopping website/apps. When a mobile technology is less complex, consumers experience less anxiety and perceive more control when using it, and hence increase use of the system. Thus, website/app developers should reduce affective barriers created by consumers due to concerns about operation errors during mobile purchasing transactions. Website developers should also eliminate system features that cause anxieties among mobile shoppers, and create a simple and user-friendly interface that mobile shoppers can control easily. A simple tutorial on how to purchase goods or services increases mobile shoppers’ confidence in the system. M-shopping providers should also ensure that telecommunication networks are adequate, meaning that they are fast, and easy to access, to encourage positive perceptions from mobile shoppers.

Empirical results from extant studies suggest that consumers’ trust affects BI both directly and indirectly (Alwi et al., 2016; Ghazali et al., 2016). Thus, it is important for developers to improve designs on M-shopping websites and apps namely with regards to ease of navigation, security and privacy protection, information quality, and third-party seals and during business transactions (e.g. reputation). Designers should integrate structural assurance systems on M-shopping sites/apps to reduce fraud, uncertainties, and potential risks to facilitate transactions during M-shopping. Providers should improve a system’s security features such as encryption and firewalls, which eliminate external intrusions to make consumers feel safe when performing financial transactions during purchases. Developers should also include satisfaction guarantee policies as a trust-building measure that minimises risk perceptions. A review and testimonial column that mitigates shoppers’ doubts and concerns of product quality should be added to websites/apps to encourage consumers’ trust and confidence, and safety features on M-shopping sites/apps should be emphasised to build confidence and gain trust.

7. Limitations, future research and conclusion
Although its results suggest implications for managers, this study can be further improved by overcoming several limitations. M-shopping behaviours were not included in the model, and thus future research should examine causal relationships between intentions and use. Criteria for consumer classification should be elaborated, and other moderating factors such as age, gender and experiences should be investigated in future studies. We also recommend examining consumers’ adoption intentions with additional constructs that the literature suggests such as compatibility, accessibility and convenience. The focus of BI studies should not be limited to individual characteristics, but should broaden to technology, system, and experience flow perspectives. Research should focus on shoppers’ perceptions of M-shopping regarding continuous purchasing intentions, and preferred types of product acquisitions through M-shopping. Despite these limitations, we argue that this paper enhances understanding of M-shopping, and guides provision of future M-shopping services. Results are useful to practitioners when introducing new dimensions of business in retail using marketing strategies to increase future M-shopping use.

References


GSMA Intelligence (2015), The Mobile Economy, GSMA Intelligence, London.


**Further reading**


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