

A Conceptual Model for Understanding Mobile Data Services Post-Adoption in Malaysia

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Abstract: Mobile data services has rapidly diffused and became one of the most popular internet services in the world. The aim of this study is to understand mobile data service post-adoption behaviour. Information system literature shows that IS users habitual tendency has been neglected in the information system success context. The present study will extend by habit through investigating its antecedent and consequence. The survey of the present study will be conducted in Malaysia targeting mobile data services existing users. The study will be quantitative research. Structural equation modelling technique will be followed to analyse the collected data and test the research proposed model.

Key words: Mobile data services, information system, satisfaction, habit, post-adoption, model

INTRODUCTION

Given the significant growth in the internet and information technology, mobile data services diffused rapidly and became of the dominant services in the world (Kim, 2012; Kitchen *et al.*, 2015). Mobile Data Services (MDS) can be defined as a set of internet data services can be accessed by individuals using personal mobile devices over a wide geographic area (Hong and Tam, 2006). Through hand-mobile devices, the services provides users with accessible platform to the internet facilitating the user's accessibility to any digital information resources (Lee *et al.*, 2009).

By the end of 2015, international telecommunication Union reported that telecommunication market sector showed rapid growth. The number of mobile internet subscribers exceeded 4.5 billion subscribers. Asia accounted 42% of total number, reflecting high penetration level in tandem to other global areas. In Malaysia, Malaysian Communications and Multimedia Commission reported that 85% of the internet users prefer to regularly engage to the internet via their mobile devices. It was reported that, Malaysia is well ahead of developed countries using smartphones such as Britain 63% followed by Australia 60%, United States 57%, Germany 53% and France with 49%, respectively.

From the perspective of mobile network operators, many telecommunication companies should have significant investments costing billions of dollars in building the necessary technical infrastructure for such networks in order to acquire 3G and 4G licenses

(Fuentelsaz *et al.*, 2008; Kim, 2012). Yet with saturation of the mobile services market, mobile services users expect to be offered with many recent advance telecommunication applications such as WhatsApp, Viber, Snapchat, Facebook, maps and the like with low cost and superior value. As a result of that, the services operators are vulnerable to face a decrease in their revenue and short term profitability (Kim *et al.*, 2009). Therefore, the services network operators turned to invest on the value added services such (mobile data services) that provides users with various applications operating wide range of internet data services.

In the marketing literature, making current consumers loyal to the services provider is a critical issue. For example, keeping existing customers loyal is a fundamental concern for improving the services provider revenue and profitability in the long-term (Bansal *et al.*, 2004). Reichheld and Sasser (1990) claim that acquiring a new customer would cost five times more than retaining current one. Furthermore, literature in the IS post-adoption domain, revealed that the ultimate success of Information System (IS) depends on the continuous use of IS rather than the initial use by individuals (Bhattacharjee, 2001). Correspondingly, in the mobile market context, keeping existing subscribers is critical concern leading the network operators to reduce their promotional costs and improve their profitability and revenue.

Therefore, it is important to understand mobile data services user's usage behaviour in order to identify potential factors influencing their post-adoption

behaviour. Previous post-adoption empirical research concentrated identifying factors influencing mobile data services satisfaction and intention in the post-adoption context (Kim and Oh, 2011; Hong *et al.*, 2008; Yang and Jolly, 2009; Yang, 2010; Fuksa, 2013; Kitchen *et al.*, 2015) provided significant findings in identifying factors driving mobile data services behaviour in the post-adoption context.

However, so far there is no study focused on the impact of the services user's habitual interaction with the services characteristics on the user's continuance intention. Therefore, the present study will investigate the antecedent and consequence of mobile data services habit tendency to response the services stable context cues. IS literature shows that as many IS empirical studies confirmed that habit is a key determinant of IS user's continuance intention and actual usage (Venkatesh *et al.*, 2012; Kang and Lee, 2010), previous IS research regarding to habit considered satisfaction and stable context as a key antecedents of habit in the post-adoption domain (Limayem *et al.*, 2007). Therefore, identifying antecedents of habit in the IS success context may provide mobile data services providers with useful guidelines on potential factors to be considered when developing retention policies among mobile data services user.

Literature review: Various theoretical views were proposed to understand IS post-adoption phenomena. Expectation Confirmation Model (ECM) and IS success theory can be seen the dominant theoretical views that focused on the IS user's satisfaction and post-adoption behaviour.

Expectation Confirmation Model (ECM): The ECM is widely used to understand IS user's continuance intention. The model suggests that the success of IS depends on the continuous use rather than the initial use of IS (Bhattacharjee, 2001). The model contains four dimensions which are confirmation, perceived usefulness, satisfaction and continuance intention. According to (Bhattacharjee, 2001), confirmation which is the IS user's perceptual congruence between expectation of IS actual performance while perceived usefulness reflects IS user's perception of the expected benefits of IS usage. In addition, satisfaction represents the IS user's affection feeling about IS prior experience. Finally, continuance intention refers to the IS user's propensity to continue using IS. Bhattacharjee (2001) argues that ECM explains IS users experimental cognitive process in generating individual's continuance intention towards IS. Many IS empirical studies applied ECM to understand individual's post-adoption in several contexts of mobile

internet services such as mobile data services, mobile communication applications, mobile site browsing (Hong *et al.*, 2008; Kim *et al.*, 2014; Zhou, 2013; Hong and Tam, 2006; Thong *et al.*, 2006; Boakye, 2015).

Information system success theory: Based on intensive review of theoretical and empirical IS studies, DeLone and McLean (1992) developed the original IS success model in order to understand IS usage behaviour. The IS success taxonomy consists of six interrelated factors which are system quality, information quality, system use, satisfaction, individual impact and finally organizational impact. System quality refers to the system technical characteristics such as reliability, convenience, navigability, usability, usability and responsiveness. Information quality reflects the semantic competencies of the system such as usefulness, accuracy, relevance, format, customization, timeliness. DeLone and McLean (1992) considered user Satisfaction as the IS user's attitude towards the IS used while system use reflects the IS users actual usage. Finally, individual impact and organizational impact predict the impact of IS used on the individual and organizational levels. The model was widely used as substantial model understanding IS satisfaction and usage behaviour (Pitt *et al.*, 1995; Seddon and Kiew, 1996; Rai *et al.*, 2002; Iivari, 2005). However, after looking on the past empirical tests of the model by other IS empirical studies, DeLone and McLean (1992) admitted the model robustness in predicting IS usage behaviour. Furthermore, they considered other scholar's critics and modifications for improving their taxonomy towards more comprehensive model.

Consequently, Delone and McLean (2003) proposed the updated IS success model in more comprehensive perspective to encompass e-Commerce domain rather than original model that concentrated on organizational context. They incorporated the services quality construct as a third dimensions of IS quality aspects. It represents the whole kind of supports provided by IS Department or any outsource (Pitt *et al.*, 1995; Delone and McLean, 2003). They also accepted (Seddon, 1997) point of view and consequently changed the construct system use to user intention and substituted both individual impact and organizational impact constructs by net benefit. Delone and McLean (2003) parsimonious construct and encouraged IS researchers to determine the IS net benefit regarding to the context and objectives for each e-Commerce investment. Clearly, the updated IS success model consists of six interrelated dimensions which are system quality, information quality, services quality, satisfaction, intention and net benefits. DeLone and Mclean (2004) empirically tested the updated

success model into two cases of e-Commerce to validate the model six dimensions measures and its interactions. They finally revealed that the updated IS success model is robust and applicable model for understanding e-Commerce success. The updated IS success model is popular model and it was validated and extended by many IS empirical studies. The model was applied in many contexts of mobile services domain such as mobile internet (Cheong and Park, 2005), mobile social network (Zhou *et al.*, 2010), mobile website adoption (Zhou, 2011) and mobile banking (Gu *et al.*, 2009). These studies have extended the updated IS success taxonomy by additional attitudinal constructs from other IS theories such as perceived usefulness, ease of use, perceived value, trust, relative advantage regarding to the context of each study.

Habit: Habit refers to the extent to which individuals tend to perform a certain behavior automatically because of learning (Limayem *et al.*, 2007). It is a perceptual term that reflects the IS users regular readiness for performing responses to the IS contextual cues regarding the individuals silent stimuli (Bouton *et al.*, 1999). The concept of habit is not a behavioural term nor intentional construct (Limayem *et al.*, 2007). Some may overlap between habit and intention. Habit represents an automatic unconscious tendency to perform a certain act under particular situation while intention represents a deliberate, conscious propensity to perform behaviour (Wang *et al.*, 2013). Limayem *et al.* (2007) hold that habit is influenced by IS stable context cues. This implies that mobile data services usage behaviour is controlled by the services characteristics in the regular usage which consequence influence their continuance intention. Finally, habit is considered one of critical factors determining IS user's post-adoption intention and actual behaviour. Empirically, habit has been extensively studied in the IS post-adoption context in various perspectives (Kim, 2012; Chiu *et al.*, 2010; Venkatesh *et al.*, 2012).

MATERIALS AND METHODS

The present study will use study based questionnaire to survey mobile data services user's perceptions along with Malaysia. The research intends to adapt mobile data services characteristics measurements such as system quality, information quality and services quality from (Kim *et al.*, 2011). Satisfaction and continuance intention (Bhattacharjee, 2001; Lin, 2008), perceived value (Kim and Han, 2009) and habit (Limayem *et al.*, 2007). The indicators will undergo for slight amendment following the present study context. The questionnaire will have 7-points Likert Scale ranging

from 1 strongly disagree to 7 strongly agree. Finally, the present study will be quantitative empirical research. It will follow structural equation modelling technique in order to analyse the collected data and then tests the research proposed model hypothesis.

RESULTS AND DISCUSSION

The research model and hypothesis: The present study proposed presented in Fig. 1. It contains seven factors that is built based on the IS literature review. The model is proposed to understand mobile data services user's post-adoption propensity to use the services.

Determinants of continuance intention: The present study proposed model suggests that continuance intention in the mobile data services context is determined by three determinants perceived value, satisfaction and habit.

IS success studies suggest that, perceived usefulness/net benefits influences IS users post-adoption intention (Bhattacharjee, 2001; Delone and McLean, 2003). In the IS paid services context, empirical studies hold that perceived value is a best surrogate of perceived usefulness when assessing paid services user's expectation in terms of relative advantage and image (Wang, 2008; Kettinger and Smith, 2009). Perceived value is defined as the consumer's trade-off on what is received to what is given (Zeithaml, 1988). Mobile data services is paid services and users pay to use the services regarding the trade-off formula. Thus, it is hypothesis that:

- H₁: perceived value will have positive influence on continuance intention

Satisfaction is the services user's judgment in comparison to their post-adoption expectations. If the services users are satisfied with services performance, they are expected to continue using the services and vice

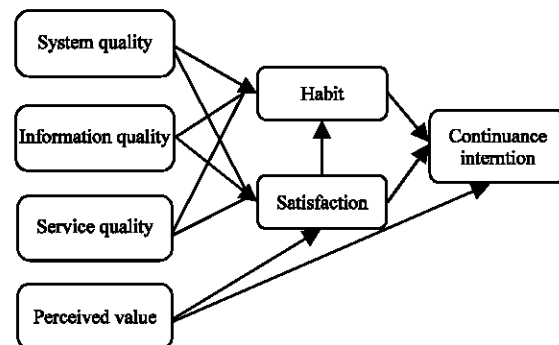


Fig. 1: The research model

versa. IS literature regarding to post-adoption domain demonstrated that satisfaction is a key factor of IS users continuance intention (Bhattacharjee, 2001; Thong *et al.*, 2006; Kim *et al.*, 2014). Therefore, the present study will assume that:

- H₂: satisfaction will have positive influence on continuance intention

Habit refers to the individual's tendency to response to a certain situation automatically because of learning (Limayem *et al.*, 2007). In the IS post-adoption context, IS users perform many goals related behaviors to achieve certain tasks. Pervious IS post-adoption studies regarding to habit asserted the role of habit in predicting IS post-adoption behaviour (Limayem *et al.*, 2007; Kim, 2012; Wang *et al.*, 2013). Therefore, the present study assumed that:

- H₃: habit will have positive impact on continuance intention

Determinants of habit: Stable context cues facilitate individual's propensity to perform the same action for achieving identical incentives (Wood *et al.*, 2002). In the IS post-adoption context, Limayem *et al.* (2007) revealed that stable context is a key antecedent of IS users habit. Venkatesh *et al.* (2012) demonstrated that facilitating condition is a strong determinant of IS user's actual use. Empirical support in the IS literature reported that IS characteristics influence the system use (DeLone and McLean, 1992; Pitt *et al.*, 1995). Mobile data services users are constantly offered with supportive digital network that facilitates their tasks achievement in performing their goals. They tend to perform the same activities under the influence of the services competencies regarding their learned memory of past-experience. Thus, it assumed that:

- H₄: system quality will have positive influence on habit
- H₅: information quality will have positive influence on habit
- H₆: services quality will have positive influence on habit

Satisfactory experience is expected to guide individuals to repeat the same act, when the action is associated with the individual's identical desires (Aarts and Dijksterhuis, 2000). In the IS literature, satisfaction is a key determinant of habit (Limayem *et al.*,

2007; Kim, 2012). Therefore, when mobile data services users have satisfactory experience, they will reuse the services automatically regarding their satisfaction decision. Therefore, it is hypothesized that:

- H₇: satisfaction will have positive impact on habit

Determinants of satisfaction: Delone and McLean (2003) revealed that IS system quality, information quality and services quality are critical determinants of IS users satisfaction. Empirical support from IS demonstrated the impact of IS quality aspects on the users satisfaction decision (Delone and Mclean, 2004; Pitt *et al.*, 1995; Zhou, 2013). Mobile data services providers provide users with sophisticated services quality aspects attracting their perception to reuse the services constantly. Therefore, with frequent use of mobile data services, users form their satisfaction decision towards the services quality aspects. Therefore, it is hypothesized that:

- H₈: system quality will have positive influence on satisfaction
- H₉: information quality will have positive influence on satisfaction
- H₁₀: services quality will have positive influence on satisfaction

IS prior scholars confirmed the impact of post-acceptance expectations perceived usefulness/net benefits on IS user's satisfaction (Bhattacharjee, 2001; Delone and Mclean, 2004; Seddon, 1997; Rai *et al.*, 2002). As already discussed, empirical studies in IS post-adoption domain revealed that perceived value is the best surrogate of perceived usefulness when assessing paid services user's expectation in terms of relative advantage and image (Wang, 2008; Kettinger and Smith, 2009). Mobile data services is paid services and thus, the monetary and usage other multi-utility aspects should be considered when assessing the influence of post-expectations on users satisfaction. Therefore, the present study will assume that:

- H₁₁: perceived value will have positive impact on satisfaction

CONCLUSION

The current research extend (Delone and McLean, 2003) model by habit (Limayem *et al.*, 2007) concentrating

on the mobile data user's regular evaluation to the services characteristics during their frequent usage behaviour. Namely, the proposed model contribution is by investigating how habit contributes to the mobile data services user's continuance intention in regard to the services features and user's satisfaction. The present study will assess the association between mobile data services competencies and satisfaction with the user's regular habitual tendency towards continuance intention to use the services. In addition, the present study will evaluate the impact of perceived value in terms of relative advantage and image on mobile data services satisfaction and continuance intention.

RECOMMENDATIONS

Researchers expect the proposed integrated model will guide the research to provide deeper understanding on factors determining mobile data services user's post-adoption behaviour. It will also provide mobile services management with meaningful guidelines on determinants to be considered when developing retention policies. Finally, researchers still working in the gaps empirical field and findings will be released in further publication.

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