Mobile App Stores from the User's Perspective

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Abstract. The use of smartphones has become more prevalent in light of the boom in Internet services and Web 2.0 applications. Mobile stores (e.g., Apple's App Store and Google Play) have been increasingly used by mobile users worldwide to download or purchase different kinds of applications. This has prompted mobile app practitioners to reconsider their mobile app stores in terms of design, features and functions in order to maintain their customers' loyalty. Due to the lack of research on this context, this study aims to identify factors that may affect users' satisfaction and continued intention toward using mobile stores. The proposed model includes various factors derived from information systems literature (i.e., usefulness, ease of use, perceived cost, privacy and security concerns) in addition to the dimensions of mobile interactivity (i.e. active control, mobility, and responsiveness). The study sets out 13 hypotheses that include mediating relationships (e.g., perceived usefulness mediates the influence of ease of use, active control, responsiveness and mobility; perceived ease of use mediates the influence of active control). As well as outlining the proposed research method, the research contributions, limitations and future research recommendations are also addressed.

Keywords: Mobile app stores · App Store · Google Play · E-Satisfaction

1 Introduction

Nowadays, various mobile applications (mobile app) are searched, purchased and installed by users using mobile stores (m-stores) as an electronic platform (Genc-Nayebi and Abran 2017). These m-stores enable users to download different kinds of applications and share their feedback as a rating or review (Iacob et al. 2013; Singh

et al. 2017). The rapid growth of the Internet and Web 2.0 applications has helped to increase the use of smartphones worldwide (Baabdullah et al. 2019a, 2019b). This heavy use is also due to the portability and accessibility of mobile devices. This in turn has prompted mobile app practitioners (e.g., mobile app developers) to intensively compete to maintain their market share in this competitive market (Harman et al. 2012). App Store, the first successful m-store, was launched by Apple in July 2008, and this was followed by a number of stores appearing and prospering in a growing market in the 2010s, as well as the emergence of app ecosystem studies (Roma and Ragaglia 2016). By the beginning of 2017, more than 2.2 million applications were available via App Store, and more than 2.8 million apps were distributed via Google Play store (Statista 2018a). Moreover, approximately 178.1 billion apps were downloaded and used by smartphone holders by the end of 2017 (Statista 2018b). However, only a limited number of studies have tested m-stores from the perspectives of information systems and digital marketing, which is important for effective management and avoid failure (Dwivedi et al. 2015). Therefore, this study aims to identify factors that may affect users' satisfaction and continued intention toward using m-stores. This research, which is the first of its kind, contributes to the studied context by identifying several drivers that could help mobile app practitioners to investigate the users' perception of using m-stores. In the presence of a number of mediators, a number of factors related to acceptance and use of technology were considered in addition to mobile features in order to increase the predictive power of the proposed model. This, in turn, will guide mobile app practitioners to provide a better platform in line with the users' requirements.

2   Literature Review

A search of the relevant data sets and research platforms (i.e., Google Scholar, ScienceDirect, and Emerald Insight) reveals a scarcity of studies that have examined mobile app stores from the user's perspective. This observation was made by Genc-Nayebi and Abran (2017) in their systematic review study. In fact, most studies of mobile app stores have conducted their analyses based on the technical and system features of this technology (Chandy and Gu 2012; Chen and Liu 2011; Harman et al. 2012). For example, based on the observational approach, three key features of app stores (comment features, static features, and dynamic features) were identified and analysed by Chen and Liu (2011). In their conference study, Harman et al. (2012) applied an algorithm technique to extract the most important features of m-stores, finding that features related to rating, price, and rank of downloads were the most critical.

A conference paper by Iacob et al. (2013) manually analysed the key features of app stores. The authors reported the importance of existing features such as versioning, comparative feedback, price feedback, usability, and customer support. Using the same manual method, Ha and Wagner (2013) scrutinised and categorised the reviewing reports created by users of Google Play apps. They noticed the considerable attention paid by users to quality, functionality, and aesthetics. By using the classification and regression tree (CART) method, Chandy and Gu (2012) evaluated the main features of Apple's App Store. They found that there were a number of important aspects related to

reviewing, ranking, and rating statistics, along with app developer statistics (number of apps and rating mean). By adopting an experimental approach, Shen (2015) validated the moderating impact of both perceived risk and type of application on the relationship between reputation sources and attitudes toward adopting the targeted apps.

Liu et al. (2014) tested the extent to which a freemium strategy could predict sales volume and review rating. Based on data extracted from highly ranked apps, they found a positive relationship between freemium strategy, quality of Google Play apps, and volume of sales. Similarly, Roma and Ragaglia (2016) tested the relationship between three types of revenue model and sales volume of the targeted apps. They found no significant differences between paid and freemium apps in their impact on the sales performance in the case of Apple's App Store. However, as in the case of Google Play, significant differences were observed between a freemium model and a free model.

Song et al. (2014) have empirically tested key numerical and environmental features that could shape the users' satisfaction toward mobile app stores. Their results found that sufficiency, overload, and information specificity of search are the key quantity-related facilitators that predict the level of app discoverability and satisfaction. Environment-related facilitators (coherence and user-generated reviews) were also confirmed by Song et al. (2014) to have a significant impact on app discoverability. Based on data-mining extraction, Finkelstein et al. (2017) discovered a strong relationship between user rating and acceptance of the targeted m-store. They also noticed that users usually negatively rate the features of paid apps that are highly priced rather than those of free downloaded apps. Likewise, Yao et al. (2018) recently tested the main security features that could shape customer satisfaction toward using the Google Play store. Their results, which were based on the Kano Model two-dimensional questionnaire, supported the importance of privacy protection, safe browsing, and malware prevention in shaping users' satisfaction toward using the Google Play store.

Although these studies have provided clues regarding the main aspects that can shape either the success of mobile app stores or the customer perception toward using such platforms, there is a need to identify and propose a model that can capture the customer's perspective on using these stores. Indeed, such a model should first cover the main drivers that could contribute to user satisfaction with m-stores. Secondly, as these online stores are linked to mobile technology, the main mobile features have to be considered. Finally, aspects of perceived privacy and security should be addressed in any model to test the customer perspective. The conceptual model proposed in the current study is discussed in the next section.

3   Conceptual Model and Research Hypotheses

As discussed in the literature review, there is a need to propose a conceptual model that can cover the most important aspects from the user's perspective (Baabdullah 2018a, 2018b; Dwivedi et al. 2016; 2011a, b, 2017a, b; Tamilmani et al. 2017, 2018, 2019; Williams et al. 2015; Zuiderwijk et al. 2015). Therefore, different theoretical foundations have been analysed (Dwivedi et al. 2017a, b), such as the technology acceptance model (TAM) proposed by Davis et al. (1989); the theory of planned behaviour (TPB)

introduced by Ajzen (1991); innovation diffusion theory (IDT) (Kapoor et al. 2014a, b; Rogers 2003); and the unified theory of acceptance and use technology (UTAUT) (Dwivedi et al. 2017a, b; Rana et al. 2016; 2017; Venkatesh et al. 2003).

As this research attempts to achieve an efficient and rigorous model, TAM was found to be suitable for the purposes of the current study. This is because TAM has been commonly and successfully adopted by prior studies on the related area of mobile technology and commerce (e.g., Alalwan et al. 2016; Alalwan et al. 2017; Lee and Han 2015; Sohn 2017). Furthermore, the two aspects of perceived usefulness and perceived ease of use have always been the focus of attention for users in relation to using new applications, especially in the related area of mobile commerce (Alalwan et al. 2016; Rana et al. 2016, 2017; Venkatesh et al. 2012).

App stores are driven by smartphone technologies. Accordingly, it is important to consider the mobile interactivity features that have been largely recognised to have an impact on customers' perception, satisfaction, and continued intention to use mobile applications (Lee 2005). Accordingly, along with TAM factors, three main dimensions of mobile interactivity were also considered in the conceptual model: active control, responsiveness, and mobility. Since using m-stores could carry user a financial cost, it was important to consider the impact of perceived financial cost. Furthermore, using m-stores, especially when purchasing freemium and paid apps, could require users to disclose their own financial and personal information; accordingly, such platforms are more likely to expose privacy and security concerns (Slade et al. 2015a, b). Thus, it was considered important to include privacy and security concerns in the current study model.
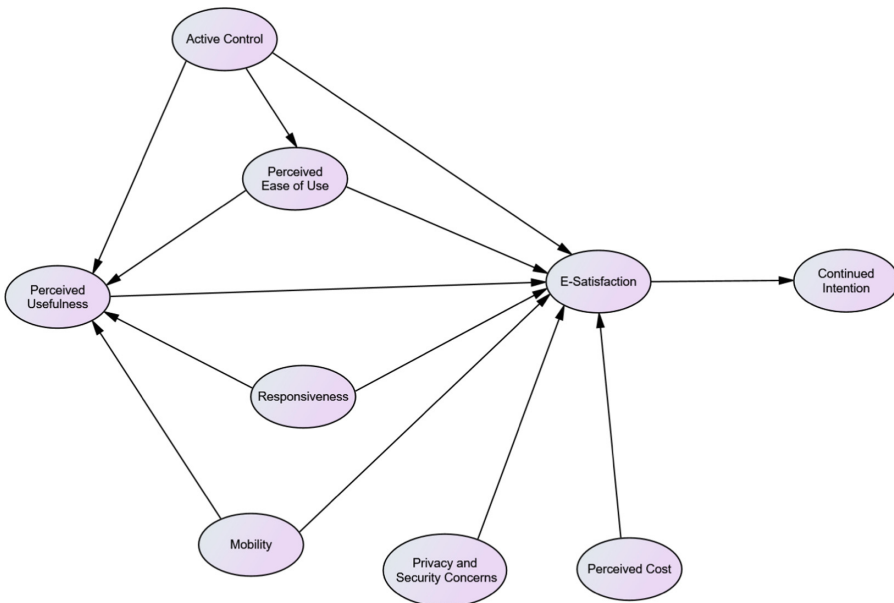
Fig. 1. Conceptual model adapted from Davis et al. (1989) and Lee (2005)

As see in Fig. 1, along with their direct impact on e-satisfaction, active control, responsiveness, and mobility were proposed to have an indirect influence via the mediating role of perceived usefulness. Active control was also suggested to have an indirect influence via the role of perceived ease of use. The instrumental impact of ease via the mediating role of usefulness was considered in the current study model as well. Both perceived cost and privacy concerns were suggested to have a negative impact on user e-satisfaction. Finally, a direct relationship between e-satisfaction and customer continued intention was proposed. All research hypotheses are presented in Table 1.

Table 1. Hypotheses summary

H#	Independent variable	Dependent variable	Hypothesis
H1	Perceived usefulness	E-satisfaction	Perceived usefulness will positively influence customer e-satisfaction toward mobile stores
H2	Perceived ease of use	E-satisfaction	Perceived ease of use will positively influence customer e-satisfaction toward mobile stores
H3	Perceived ease of use	Perceived Usefulness	Perceived ease of use will positively influence perceived usefulness of using mobile stores
H4	Active control	E-satisfaction	Active control will positively influence customer e-satisfaction toward using mobile stores
H5	Active control	Perceived usefulness	Active control will positively influence perceived usefulness of using mobile stores
H6	Active control	Perceived ease of use	Active control will positively influence perceived ease of use of using mobile stores
H7	Responsiveness	E-satisfaction	Responsiveness will positively influence customer e-satisfaction toward using mobile stores
H8	Responsiveness	Perceived usefulness	Responsiveness will positively influence perceived usefulness of using mobile stores
H9	Mobility	E-satisfaction	Mobility will positively influence customer e-satisfaction toward using mobile stores
H10	Mobility	Perceived usefulness	Mobility will positively influence perceived usefulness of using mobile stores
H11	Privacy and security concerns	E-satisfaction	Privacy and security concerns will negatively influence customer e-satisfaction toward using mobile stores
H12	Perceived cost	E-satisfaction	Perceived cost will negatively influence customer e-satisfaction toward using mobile stores
H13	E-satisfaction	Continued intention	E-satisfaction will positively influence continued intention to use mobile stores

4   Research Methodology

A quantitative research approach will be adopted for the purpose of the current study. This is because the current study model was based on a sold theoretical foundation (TAM), so the nature of the current research is to test rather than build theory. Furthermore, in order to validate the current research hypotheses, it is important to capture adequate statistical evidence from the targeted population. Thus, as it is a cost-effective data collection method, this study will run an online questionnaire survey to approach smartphone users who actually adopt and use mobile app stores (i.e., Apple's App Store and Google Play).

The main constructs in the conceptual model will be tested using measurement items extracted from the prior literature. For example, TAM factors will be measured using items proposed by Davis et al. (1989); continued intention will be measured using items from Venkatesh et al. (2012); items of e-satisfaction will be adapted from Wang et al. (2019); perceived cost will be tested using items adapted from Tsu Wei et al. (2009); items from Casaló et al. (2007) will be used to measure privacy and security concerns; the scale developed by Mallat et al. (2009) will be adapted to validate the impact of mobility; responsiveness items were derived from Zhao and Lu (2012); and Liu's (2003) scale will be used for measuring active control.

A seven-point Likert scale will be adopted to test all scale items used in the questionnaire. Before conducting the main survey, the questionnaire will be validated by a panel of experts who have specialisms in the area of digital marketing and information technology (Bhattacherjee 2012). Next, a pilot study will be conducted to ensure an adequate level of constructs' reliability (Nunnally et al. 1967). The data collected will be subjected to structural equation modelling (SEM) analyses. More specifically, a two-stage SEM approach (measurement model and structural model) was considered suitable for ensuring an adequate level of model goodness of fit, construct reliability and validity, and model predictive validity (Tabachnick et al. 2007). In this regard, it is also important to indicate that path coefficient analyses powered by AMOS will be considered for testing the research hypotheses (Hair et al. 2010).

5   Research Contributions, Limitations and Future Research Directions

This research contributes to the context of mobile devices/applications in general and m-stores in particular by identifying several drivers (i.e., perceived usefulness, perceived ease of use, active control, responsiveness, mobility, perceived cost, and privacy and security concerns) that could help mobile app practitioners to comprehensively understand the users' perception of using these electronic platforms. The proposed model in this study was developed to examine users' satisfaction and continued intention by considering a number of factors related to acceptance and use of technology in addition to mobile features. The inclusion of mobile interactivity features alongside perceived cost and privacy and security concerns in TAM would increase the predictive power of the model, especially in the presence of a number of mediators

(e.g., perceived usefulness mediates the influence of ease of use, active control, responsiveness, and mobility; perceived ease of use mediates the influence of active control).

This study is the first of its kind to investigate m-stores from the user's perspective, and it is envisaged that it will pave the way for future studies to examine the validity/applicability of the proposed model and extend it with relevant factors that may have a potential influence on user satisfaction and continued intention. Future studies may also build their research on the basis of this study's discussion of relevant work in the literature review and conceptual model sections. The results of this study will help players in the mobile app market to determine the most influential factors that can shape the user's behaviours toward using m-stores. This, in turn, will guide them to launch or redesign an interactive m-store in line with the users' requirements.

In order to develop a framework that suits the user's perspective in the context of m-stores, this study analysed various information systems theories and models. However, this is considered as one of the limitations. Accordingly, future research could conduct a meta-analysis that may help to provide a systematic review as a basis for a comprehensive model. This study is also limited to conceptual model development; therefore, it is recommended that future research has empirical results that can determine the most influential factors on e-satisfaction and continued intention. Moreover, future studies are encouraged to investigate, in addition to the use behaviour, the role of different factors that were not included in the current model. Finally, the proposed conceptual model could also be applicable in other contexts related to e/m-applications and services.

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