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FACTORS AFFECTING BEHAVIORAL INTENTION AND ACTUAL USE OF MOBILE APPS IN VIETNAM

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ABSTRACT

Since the mobile phone industry in Vietnam presents very high growth potential, especially for mobile Apps, it is crucial and necessary to understand the behavioral intention and actual usage of Vietnamese smartphone users when using mobile Apps. Although mobile apps are already an influential medium in the new media industry as a whole, these apps have received little academic attention within the communication and marketing literature, especially in Vietnam perspective. Based on theoretical framework of Technology Acceptance Model (TAM), this study develops and tests a hypothesized model to explain antecedents affecting smartphone user's behavioral intention and their actual app usage in Vietnam population. The regression analysis resulted to a final model with three significant factors having directly influences on user's behavioral intention to use mobile Apps, as well as showing the direct influence of user's behavioral intention on their actual Apps usage. Beside marketing implications, this study also offers insight into various theoretical applications to the field of mobile communication research by suggesting a conceptual model for the acceptance of mobile apps.

Keyword: mobile apps, technology acceptance model (TAM), user review, cost-effectiveness, actual use

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1. Introduction

1.1. Research background

As information technology continues to evolve and expand in every area of daily life in the society, mobile phones are developed to get smarter and smarter. The advancements of technology have enabled mobile devices to integrate more ability reaching the market's demand, as well as have more value-added services through broader data access, have led the creation of the current so-called "smartphone" (Middleton, 2010). Thanks to the advancements, more and more people around the world are using smartphones for their daily life which has resulted to an incredible increase in the use of smartphone all over the world. Lots of vendors (i.e., Samsung, Apple, Lenovo, Huawei, LG, etc.) have participated in smartphones market due to its potentials with high profitability. Along with the intense competition accelerating in smartphone industry, mobile Apps have been used widely due to their capabilities in delivering value-added services for human daily basis. The use of mobile App is also reported to significantly and continuously grow up over last year, with the overall app usage went up by 76% in 2014 (Perez, 2015). Those figures have emphasized the potential and opportunities for vendors to join to such a high profitable market. In addition, whereas mobile Apps were originally offered in the smartphones as productivity and information retrieval tools (i.e., calendars, e-mail, stock market, weather information, etc), the market has increasingly and rapidly expanded due to public demand and availability of developer tools. Currently, some of the most popular Apps categories (about lifestyle and shopping, utilities and productivity, and messaging) even have triple-digit growth in the past few years. Besides, the rapid adoption rate in the Apps categories of games, music, media and entertainment has greatly contributed to the overall increase in the mobile Apps usage of the global smartphone users. This situation creates a big room for marketing researchers and encourages the academic attention in investigating the adoption of smartphones characteristics.

Most of reports on smartphones market have figured out to a massive adoption of mobile technology in the economies from South East Asian countries, especially from Vietnam. This adoption trend appeared thank to the technologically networks, the downward spiral of data costs, as well as the low-cost and high feature web-usable mobile handsets, typically the smartphones (Shukla, 2011). Actually, after the internet, mobile technology likely has the fastest technology adoption rate in Vietnam. According to a research by Flurry Analystic, Vietnam took the second place in the top increasing rate in smartphone market in the world (Appota, 2013). As reported in

The Connected Consumer Survey by Google (2014), nearly 40% Vietnamese population own and currently use a smartphone for communicating purpose as well as their daily life. Due to the accelerating rate of adoption of smartphones, the number and popularity of mobile Apps is rising dramatically (Xu et al., 2011), which leads to an increase in the number of App developers and makes the marketplace more competitive. Satyanarayanan (2005) indicated that smartphone users are now able to take the advantages of a huge range of mobile Apps almost anywhere at any time in their daily life, thanks to the incredible increase in the number of mobile Apps available in the market. This is likely to benefit consumers, with greater choice of mobile Apps along with competitive services as well. Involved into the situation, developers need to understand clearly about factors that affect mobile App usage among smartphone users. Therefore, it is necessary, for not only developers but also all marketers in the industry, to investigate the habit of smartphone Apps usage among Vietnamese user, deeply in their attitude toward using an App, as well as figure out what are other antecedents that might affect user's intention to use the Apps and examine their actual mobile Apps usage in such a high potential industry.

Research motivation and objectives

In the era of hi-tech industry, smartphone and its applicability in society is a timeless topic for academic studies. Falaki et al. (2010) found evidence that there is substantial diversity in the mobile apps usage by different smartphone users. However, while a plenty of studies have focused on understanding smartphone Apps usage from different perspectives yielding insights into different fields in the mobile computing community, most of them were only conducted in highly developed economies that have high rate of mobile Apps adoption (Xu et al., 2011; Wai, 2012; Kim, Yoon, & Han, 2014). Additionally, though smartphones Apps is not a relative new technology in Vietnam, this topic received little attention in the past and the influential factors affecting Vietnamese smartphone users' intention and their actual use are not commonly discussed in prior studies. Therefore, the study aims to figure out which factors affect on smartphone users in term of using mobile Apps as well as to identify their habits of downloading and using mobile Apps in Vietnam. Hence, smartphone apps is the main focus for investigation in the present research and following research objectives in specific to the context of smartphone apps are established:

(1) To research in the smartphone apps usage behavior in Vietnam.

(2) To examine the attributes that smartphone users in Vietnam perceive to be important in the usage adoption of mobile apps.

(3) To investigate the structural relationships between antecedents and behavioral intention as well as actual behavior of mobile apps usage.

(4) To give an all-around marketing and strategies based on the findings.

1.2. Research structure

This study includes six chapters and the chapter structure is as following. The first chapter introduces the research background, motivation and objectives of the research. Chapter two is the literature review section which collected and summarized the related literature to the scope of the study. In addition, this chapter gives the definitions and characteristics of each major factor adopted in the research as well as the concept of research model with some hypotheses. The third chapter is the methodology including questionnaire design and the analysis method utilized. Chapter four is the results after analysis process. Chapter five includes some findings from the results and draws some implications. The final chapter is the conclusion section that raises some discussions relying on the empirical results, provides contributions for managers and marketers as well as app developers, and ended with the research limitations and some suggestion for future research.

2. Literature review

This chapter provides major issues in the mobile apps market in Vietnam and identifies the determinants related to Vietnamese smartphone user's intention and actual app usage as well as how these determinants affect their intention and actual behavior. The literature about mobile industry and mobile apps was also reviewed deeply within this chapter.

2.1. Conceptual framework

Adoption of new technologies has been extensively researched across disciplines from marketing to information system management to communication and psychology. Among information

technology related research, the research field which attracts the most attention is the use and adoption or acceptance of new information technology (Lee et al., 2012). Despite of various contributions to different theories, all researches are aimed at exploring and explaining how users perceive, adopt, and consume IT. In existing technology acceptance studies, the variables related with human attitude or intention which have been handled in social psychology field are adopted, the representative research related with technology acceptance are Theory of Reason Action (TRA), Theory of Planned Behavior (TPB) and Technology Acceptance Model (TAM). Based on these theories, this section provides a deeply literatures about the concept of innovation diffusion theory, the TAM and its related constructs, the concept about theories of consumer behaviors (TRA and TPB), as well as some suggested hypotheses to test the relationship between proposed constructs to investigate the effects of major factors on the usage among smartphone users in term of mobile apps.

2.1.1. Innovation diffusion theory

Recently, researchers have examined how technology users' perception of innovation affected their adoption (Chen, Gillenson & Sherrell, 2002). The innovation diffusion theory was used to address why and how an innovation spreads and illustrates its characteristics leading to the widespread acceptance by the users. Those characteristics have already successfully explained by a number technology acceptance behavior studies (Wonglimpiyarat & Yuberk, 2005; Agyeman et al., 2009; Aizstrauta et al., 2015). Nevertheless, while most of the diffusion factors examined in the literature are often seen and applied separately from acceptance models, mostly based on Rogers' diffusion of innovation theory (Kaplan, 2001); there is little integration between them. Moreover, the disadvantage that the theory cannot clearly explain how attitude is formed, how it leads to the intention and actual adoption of technology user, and how innovation diffusion characteristics fit into this process has opened new room for academic research. In order to enhance the weakness of innovation diffusion theory, some researchers have integrated it with other theories allowing it to address the interaction between attitude, intention, and actual behavior. Venkatesh et al. (2003) provided a comprehensive examination of eight prominent models, which can explain as much as 70% of the variance in intention. Yi et al. (2006) developed an integrated model by combining innovation diffusion theory with the TPB and TAM for predicting Personal Digital Assistant (PDA) adoption by healthcare professionals.

Martins, Oliveira and Popovič (2014) utilized the Unified Theory of Acceptance and Use of Technology (UTAUT) to explain behavioral intention and actual use of Internet banking. Within the scope of this study, the TAM was used as basic conceptual model to investigate the influence of antecedent factors on smartphone user's intention to use mobile Apps as well as examine their actual usage.

2.1.2. Original Technology Acceptance Model (TAM)

The original TAM was proposed by Davis (1989) and Davis et al. (1989) as an instrument to predict the likelihood of a new technology being adopted within a group or an organization. Based on the TRA (Fisbein & Ajzen, 1975), the TAM is founded upon the hypothesis that technology acceptance and use can be explained in terms of a user's internal beliefs, attitudes and intentions. This study used TAM as the theory basis for this research for two main reasons. The first reason is that according to TAM, consumers' attitudes affect behavioral intentions which in turn influence actual behavior. In comparison with other TRA and TPB (Ajzen, 1991), Gentry and Calantone (2002) argued that TAM seems to have better explained variance in behavioral intention, particularly in the context of technology usage. Chua and Hu (2001) supported this argument by suggesting that TAM may be more appropriate than other theories examining technology acceptance by individual professionals and that the integrated model may not provide significant additional explanatory power. Secondly, a recent study conducted by Okazaki and Barwise (2011) from the mobile marketing field which reviewed the literature on mobile advertising from 1993 to 2010 showed that TAM has been the model most frequently used in studies on mobile industry. Many previous studies adopting TAM as basis model have explained the use of the mobile Internet (Shin, 2007), behavioral intention to use mobile services (Park & Kim, 2014), and acceptance of mobile SMS advertising (Muk & Chung, 2015). In this study, the intention to use mobile apps is defined as the intention for smartphone users to use mobile apps downloaded on their devices.

As being built up fundamentally from TPB and TRA, the basic assumption of TAM is that technology use is a reasoned action. TAM builds on the premise that users' behaviors are controlled by conscious and deliberate processing of the benefits associated with the technology use. The original TAM gauged the impact of four internal variables upon the behavioral intention

to use or adopt technology, which were: perceived ease of use, perceived usefulness, attitude toward use (ATT) and behavioral intention to use (INT). Notably, many studies have mostly focused and investigated the affects of consumers' perceived about the ease of use and usefulness of mobile Apps on their attitudes toward adopting technology (Kulviwat et al., 2014; Agrebi & Jallais, 2015), especially in mobile Apps research (Gurtner, Reinhardt & Soyez, 2014; Kim et al., 2014). The relationships amongst variables in original TAM can be illustrated in the Figure 1 below:

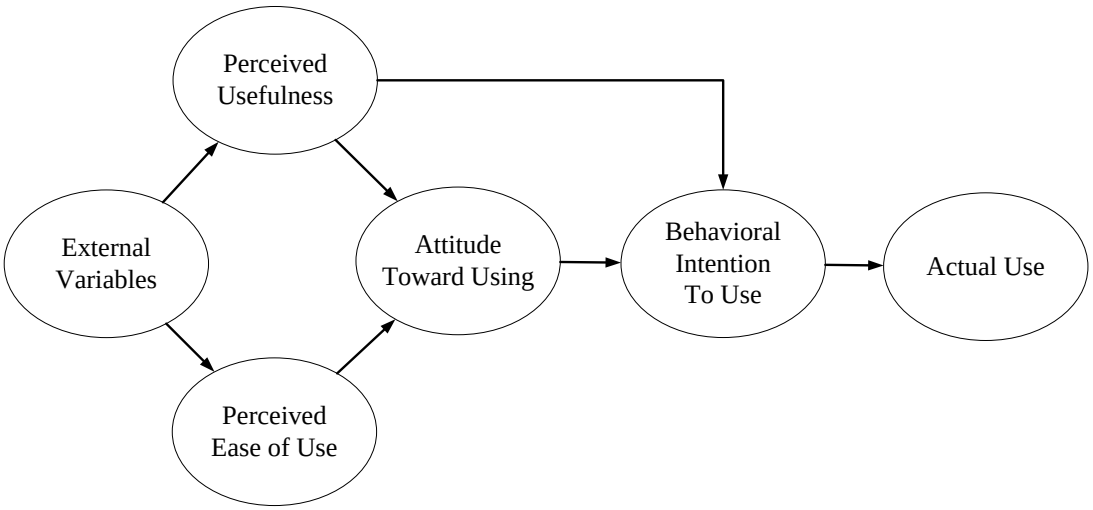

Figure 1. The original TAM model

In the original TAM, behavioral intention is used as both a dependent variable and an independent variable, being used as a dependent variable to test the influence of attitude toward using technology, and as an independent variable when predicting actual usage. Consistently, this study, therefore, adopts the TAM as major theoretical model to predict actual usage among smartphone user. Nevertheless, as adopting measurements from TAM literature, and since many studies have found positive and direct affects of perceived ease of use and usefulness of technology on consumers' attitude, these two antecedents are not included in the hypothesized framework. Hence, those antecedents are not included in this study.

2.1.3. Attitudes toward technology acceptance

Attitude toward the new system is the central feature of TAM. The attitude theory suggests that the more favorable attitude a person has towards a given product/service, the more likely that person is to buy or use that product/service (Karjaluoto et al., 2002). In particular, the

relationship of attitude toward a technology and intention to use it has been confirmed by many studies involving information systems. Most of studies found that attitude significantly and directly affects individual's behavioral intention (Liu & Li, 2011; Ayeh, Au & Law, 2013). In other words, an individual's behavioral intention to use an innovative technology is explicitly determined by his/her attitudes toward using it.

However, some other researchers argued this statement by giving contrast conclusions. Davis, Bagozzi, and Warshaw (1989) argued that there was no significant influence caused to behavioral intention by attitude towards technology. The explanation for this argument is that in reality, people may use a technology even if they do not have a positive attitude toward using and just because the technology improves their productivity. The equivocation and inconsistency has lead to a consequence that some studies did not include attitude as a conceptual variable to examine the technology acceptance (Gurtner et al., 2014; Agrebi & Jallais, 2015). In this study, the measurements were adopted from previous studies of Bauer et al. (2005) and Kim et al. (2014). Dealing with the gap in literature, this study aims to investigate the relationship between these two major factors in TAM in the case of mobile Apps industry. Therefore, user's attitude towards using mobile Apps is hypothesized to explain their usage intention, or in other words, is expected to predict user intention to use the Apps.

H1: User's attitude toward using mobile Apps directly affects intention to use mobile Apps.

2.1.4. Behavioral intention and actual use

In literature, the TAM examines both intention to use and actual use of the technology, assuming that intention is a strong predictor of actual behavior. According to this theory, many studies have found that technology user's actual behavior is primarily explained by their behavioral intention which is formed as a result of the conscious decision-making processes (Yi & Hwang, 2003; Shin, 2009). The behavioral intention to use, therefore, has being considered as an important factor that determines whether users will actually utilize the system. However, Bagozzi (2007) stated that "the relationship between intention–behavior is probably the most uncritically accepted assumption in social science research in general, and in technology acceptance research in particular". While most studies found significant influence to actual use

by behavioral intention, Lim et al. (2011) argued that the relationship between behavioral intention and actual use was weak and non-significant. Thus, it is important to take this issue into investigation to make a conclusive finding. In this study, the variable was represented by statements referring to previous studies of Gurtner et al. (2014) and Kim et al. (2014).

In addition, while there have been numerous studies measuring behavioral intention, there have been very few studies that have examined actual behavior of the users because of difficulties in its measurement. Some studies also have questioned about the strength of the link between behavioral intention and actual use in some contexts. Consequently, it is necessary to test the relationship between behavioral intention and actual use of smartphone user toward mobile Apps.
H4: User's intention to use mobile Apps directly affects their actual use of mobile Apps.

However, although TAM has been found to be a useful theoretical framework in predicting adoption and use of technology innovation, previous research on behavioral intention applying TAM found that the traditional method was limited to support investigation about various exogenous variables, the relationship among variables as well as cannot explain all the factors that affect app users' behavior. In an effort to address the limitations of TAM, additional variables have been proposed and tested for inclusion in, or extension of, TAM. This explains why the proposed framework model just includes partly some TAM-related variables, and adds some other factors such as app user reviews and cost-effectiveness into hypothesized framework.

2.2. Additional variables

2.2.1. Reviews by app users

Nowadays, consumer reviews have increasingly become a convenient and important source of information for product developers, consumers and academic researchers to understand customer requirements, product characteristics, and market responses (Wei et al. 2006). Especially, it is becoming more and more important to learn customer's emotional inclinations and favorites through their comments about the products, specifically mobile Apps in this study. The potential of reviews by app users as another factor affecting behavioral intention is theoretically explained by the TRA. This theory basically proposes that behavior is determined by behavioral intention, which is predicted by people's attitude toward that behavior and subjective norms (Fishbein &

Ajzen, 1975). In research on mobile service use, TRA has been used mainly as a way to extend TAM and include normative influences (Teo & Pok, 2003). Because of the importance of social influences on media use, TRA posits that subjective norms have a direct effect on behavioral intention (Fishbein & Ajzen, 1975). Subjective norms in this study, accordingly, can be defined as user reviews about mobile apps.

According to Tian et al. (2014), users write reviews to express how they enjoy or dislike a product they purchased. This helps to identify features or characteristics of the product from users' point of view, which is an important addition to the product specification. A global survey from the Opinion Research Corporation revealed that online consumer reviews play a major role in consumers' decisions about whether or not to purchase products or services (Wei & Lu, 2013). In case of mobile Apps, reviews can only be written after downloading a certain app which ensures actual usage experience of the authors. Accordingly, user reviews are provided by users with actual usage experience and are not biased by questionnaire specific issues, which offer businesses the opportunity to economically and expediently perform in-depth and comprehensive market landscape analysis. Cummings et al. (2013) stated that it is difficult for user to differentiate credible and safe apps from those which are not. Thus, Apps reviews and rating score from other users can give the readers brief and simple index to compare for the most suitable selection.

In literature, the positive role of consumer reviews predicting behavioral intention has been investigated in the context of Internet-based electronic commerce (Pan & Zhang, 2011; Benlian et al., 2012). However, even though being considered as a major elements affecting behavioral intention, the issue about user's reviews was not treated well in the mobile Apps literature (Kim et al., 2014). There was little research investigating the influence of user's review to user's intention in case of smartphone industry. Notably, Kim et al. (2014) emphasized the importance of user's reviews by indicating its significant influence to the behavioral intention to use mobile Apps by smartphone users. With more and more common users becoming comfortable with the Internet, an increasing number of people are writing reviews. As a consequence, the number of reviews that a product receives grows rapidly. The measurements of user's reviews comprise 6

statements which basically adopted from previous studies of Park et al. (2007) and Kim et al. (2014). Therefore, a hypothesis arisen in the research framework as follow:

H2: User review about mobile Apps has a direct influence on intention to use mobile Apps.

2.2.2. Perceived cost-effectiveness

According to Reagan (2002), cost has almost always been a primary factor in the adoption of a new technology. From the consumer perspective, the cost concern is typically one of the most important issues in mobile technology acceptance. In the marketplaces, buyers (or users) are sensitive to the price of the product (Apps) and usually undertake cost-benefit analysis. Theories about marketing price indicate that there is no absolute high or low price, but consumers have their own subjective assessments about the prices. According to Chan et al. (2008), people are more likely to purchase goods or services that are cost-effective (i.e., relatively cheap but useful). In case of technology adoption, Cheong and Park (2005) stated that when using new innovations that require certain kinds of payment, consumers will normally compare the benefits of using such innovations to its costs. This finding emphasizes that although there are numerous issues associated with newly introduced technologies, the concept of cost is one of the most important variables relating to users' behaviors and perceptions.

The advent of the use of technology has raised the level of sophistication in business practices, not only in terms of effectiveness but also in terms of cost efficiency (Golmohammadi et al., 2012). If consumers feel that the perceived benefits obtained from using a technology are lower than the costs of consuming it, they will be less inclined to use that such technology. In the case of mobile Apps users are likely to download and use apps only if they believe the apps are worth the money (Kim et al., 2014). Thus, it is expected that users' perceptions of the cost-effectiveness of mobile Apps will positively affect intention to use, and ultimately lead to the actual use of it. The statements measuring user's perceived cost-effectiveness were adopted from previous studies of Min (2006), Park (2010) and Kim et al. (2014) after referring to previous studies.

H3: User's perceived cost-effectiveness about mobile Apps has a direct influence on intention to use mobile Apps.

In short, as this study aims to investigate the behavioral intention and actual use of smartphone user in term of mobile Apps, predictors such as attitude toward using mobile Apps, user's reviews about Apps, and user's perceived cost-effectiveness about Apps were included for the consistency and reliability of the study. The research framework is illustrated as the Figure 3 as follow:

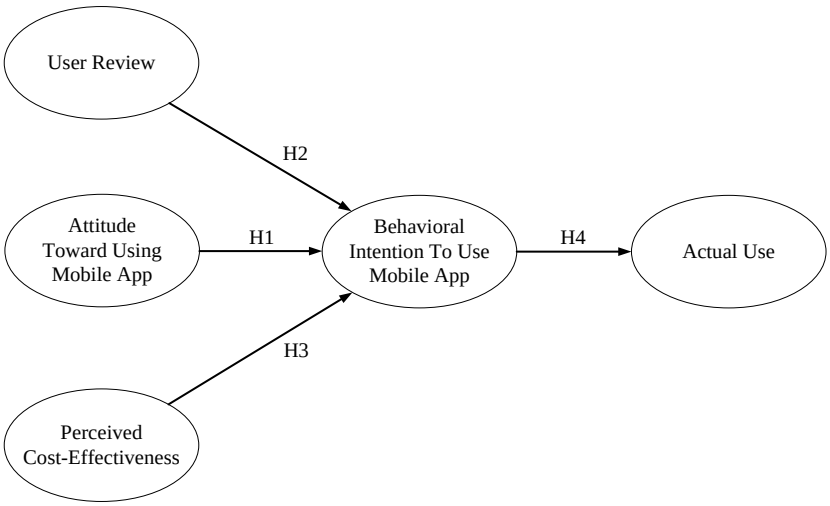

Figure 2. Research framework

3. Methodology

3.1. Research design

The questionnaire was a composition of 6 sections assessing Vietnamese smartphones user's actual mobile Apps usage and the influences of antecedent variables on the user's actual usage. Demographic variables get involved in the additional section of the survey questionnaire for having been proposed to have impact on user's intention to use mobile Apps and their actual mobile Apps usage. In order to examine the actual mobile Apps usage of smartphone user, the researcher has added some question about smartphone usage and mobile Apps usage. A five-point Likert scale was applied to measure opinions of respondents ranging from 1 = totally disagree to 5 = totally agree. Participants were asked to mark a tick symbol in the box that represents their best response. Demographic items were measured using multiple choice formats. All instruction and consent information were included in the questionnaire. The survey items were coded on the website database, including 6 sections totally being translating into Vietnamese language from original English version. Afterward, the survey was subjected to

small convenience sample (35 respondents) in pre-testing stage to assure the survey validity. From that point, the survey was regulated for better accuracy and precision of linguistic expression for the official distribution.

Data was collected from both convenience and snowball samples. The respondents were asked to fulfill the survey pursuant to their experience in using mobile apps in their smartphones. 292 online survey questionnaires were distributed in person through personal contacts to all individual respondents, who are identified as smartphone users. The estimated duration for a single survey to be accomplished was approximately ten minutes. There were no incentives offered for the participants in this study. Since all statements are marked as required question, a total 292 valid survey response were completed and sent back to researcher, accounting for 100% usable response rate.

3.2. Data analysis method

The Statistical Packages for Social Sciences (SPSS) software (version 20) was highly recommended for the data analysis. The overall procedure for data analysis was outlined as follow. First, descriptive statistic instrument were applied to generate frequency tables for data entry error detection and demographic analysis facilitation. Reliability test was then conducted to observe the internal consistency of variables. In the next step, the principal component analysis (so-called dimension reduction) was brought in to analyze the structure of the interrelationship between large numbers variables by identifying and grouping highly related variables into single components, which represents for the variables. After that, *t*-test and Analysis of variance (ANOVA) were used to compare the differences in user's intention and actual mobile Apps usage in different genders and age-range, different income or education levels, as well as Apps usage pattern. The implementation of Pearson Correlation test was brought in the next stage to examine to correlation among independent variables or even generate observed correlation coefficients between the whole set of independent variables. Finally, regression analysis appeared to be a major data analysis instrument to determine whether proposed hypotheses are supported or not, in other words, to investigate whether the independent variables significantly influence the dependent variable, which is the intention and actual use of Vietnamese smartphones user in using mobile apps.

4. Result

4.1. Descriptive statistics for demographics

Table 1. Descriptive statistics for demographics

		Frequency	Percent	Valid Percent	Cumulative Percent
Gender	Male	151	51.7	51.7	51.7
	Female	141	48.3	48.3	100.0
	Total	292	100.0	100.0	
Age	13-17	17	5.8	5.8	5.8
	18-24	250	85.6	85.6	91.4
	25-34	22	7.5	7.5	99.0
	35-49	3	1.0	1.0	100.0
	Total	292	100.0	100.0	
Occupation	Student	231	79.1	79.1	79.1
	Officer	44	15.1	15.1	94.2
	Worker	9	3.1	3.1	97.3
	Businessman	8	2.7	2.7	100.0
	Total	292	100.0	100.0	
Education level	Junior high school	4	1.4	1.4	1.4
	Senior high school	39	13.4	13.4	14.7
	College	58	19.9	19.9	34.6
	Bachelor's Degree	166	56.8	56.8	91.4
	Master's Degree	23	7.9	7.9	99.3
	Doctoral Degree	2	7.0	0.7	100.0
	Total	292	100.0	100.0	
Income level	Less than 3,000,000 VND	180	61.6	61.6	61.6
	About 3,000,000 to 5,000,000 VND	61	20.9	20.9	82.5

About 5,000,000 to 10,000,000 VND	40	13.7	13.7	96.2
About 10,000,000 to 15,000,000 VND	2	0.7	0.7	96.9
More than 15,000,000 VND	9	3.1	3.1	100.0
Total	292	100.0	100.0	

The frequency of male respondents capturing 51.71% (151 respondents) is slightly greater than that of female respondents, featuring 48.29% (141 respondents) of total 292 respondents. This statistic truly reflects the fact that the social situation about gender is resulted from the gender prejudice of many families happening decades ago, which lead to the circumstance that the number of male in the society is a little more than that of female, especially in the young generation. As consistent to the common trend of Vietnam demographic background, from which more than half of Vietnamese population are younger than 30 years old, Table 1 shows that the vast majority of respondents ages less than 25 years old, accounting for 91.44% of total sample size, the "above 25" respondents score 8.56%. There is no missing data reported. The distribution of respondents' education level was also illustrated. About 76.71% of the participants in survey were in bachelor or college education level, while 8.56% owned master degree or above. 39 respondents qualified with senior high school level, accounted for 13.36% of the sample, followed by the group of junior school education, accounted for 1.37% only. Majority of respondents had attained high level of education, which might be an influential factor of smartphone and mobile apps usage pattern. Referring to the occupation proportion shown in Table 1, most of the respondents were students (79.11%), followed by the group of officer, which accounted for 15.07% of sample. The remaining groups namely worker and businessman occupied similar portion of occupation, which were 3.08% and 2.74% respectively. With similar reasons as age distribution, the result was predictable since survey was conducted by snowball sampling method, and majority of questionnaire papers were collected in schools area. The income distribution of respondents was shown in figure 5. 180 respondents earned less than 3,000,000 VND per month, occupied 61.64% of the sample. The portion of income groups "3,000,000 – 5,000,000 VND" and "above 5,000,000" were 20.89% and 17.46% respectively. As most of the respondents were students, their income level, as well as purchasing power was

comparatively lower than the working class. Because almost of participants are student and office staff, there income must be respectively.

4.2. Smartphone and Apps usage pattern

Table 2. Descriptive of smartphone and mobile Apps usage pattern

			USE_MAIN		Total
			Yes	No	
USE_TIME	Less than 12 months	Count	44	45	89
		% within USE_MAIN	20.4%	59.2%	30.5%
	About 12-24 months	Count	43	13	56
		% within USE_MAIN	19.9%	17.1%	19.2%
	More than 24 months	Count	129	18	147
		% within USE_MAIN	59.7%	23.7%	50.3%
USE_MINS	Less than 60 minutes	Count	27	29	56
		% within USE_MAIN	12.5%	38.2%	19.2%
	About 60-120 minutes	Count	53	21	74
		% within USE_MAIN	24.5%	27.6%	25.3%
	About 120-180 minutes	Count	39	9	48
		% within USE_MAIN	18.1%	11.8%	16.4%
	More than 180 minutes	Count	97	17	114
		% within USE_MAIN	44.9%	22.4%	39.0%
Total		Count	216	76	292
		% within USE_MAIN	100.0%	100.0%	100.0%

As shown in Table 2, 216 respondents (73.97%) owned or used Smartphone as their daily mobile device, and about 26% used traditional mobile. This result reflected the high penetration rate of Smartphone users in Vietnam (about 70-80%), implying that consumers' demand for functional mobile was increasing. The result also showed the distribution of Smartphone users' usage duration. Among the population of Smartphone users (216), 129 respondents (59.72%) with over 2 years' experience of smartphone usage, followed by the group with one year usage experience (20.37%). The remaining part of sample (19.91%) was the users with 1-2 years' experience. This result implied that about 80% of respondents with over one year's usage experience, which was

expectedly high in the technological-based century. Additionally, Table 2 shows that 97 respondents (44.91%) stated that they spent more than three hours per day using apps on their smartphone, while 42.60% of the users spent from one to three hours to browse the apps during their daily life. One possible explanation could be the features of smartphone, which have changed user's mobile usage pattern. Users are willing to spend more time on the apps, which help to accompany many tasks and activities in an effective way.

Results of demographic statistic also figured out the distribution of commonly used types of apps. Not surprisingly, social network apps was the most popular apps category (24.19%), followed by entertainment and references apps, which shared similar portion of sample (more than 15%). The category of games apps follows the place accounting for 13.45% of selections, following up by the news apps with the percentage of 12.42%. Balance types of apps including personalization,, life style, business and finance shared similar proportion, with 5.69%, 5.30%, 4.01% and 3.23% respectively. These findings are consistent with the social research on Vietnamese users taken by Google (2014) that users often use smartphone for the purpose of social connecting, entertain during leisure time by listening to music, playing games or taking photographs, as well as browse apps for news updates and information accessing.

4.3. Reliability test and Factor analysis

First of all, the reliabilities of variables included in hypothesized framework were tested. The Cronbach's α coefficient of 4 items of "User's attitude toward using mobile Apps" (ATT), "User's reviews about mobile Apps" (REV), "Perceived-cost effectiveness" (COST) and "Intention to Use mobile Apps" (INT) got high reliabilities while the end-dependent factor, namely "Actual mobile apps usage" (USE), only has one measurement item was not tested in this stage since it is adopted from literature and reflects the actual use of the smartphone user.

Table 3. The Cronbach's α coefficient

Code	Factor/ Measurements	Factor loading	Cronbach's α	KMO
ATT	**Attitude toward using mobile apps**		0.782	
ATT1	I feel favorable toward mobile apps.	.775		
ATT2	I am satisfied with mobile apps provided by my smartphone.	.582		
ATT3	I find mobile apps useful.	.808		
ATT4	Generally, I like using mobile apps.	.783		
REV	**User reviews about mobile apps**		0.788	
REV1	When downloading an app, I always read reviews from others presented on the app distribution platform.	.638		
REV2	When downloading an app, I find the user reviews are helpful for my decision making.	.761		
REV3	When downloading an app, the reviews presented on the app distribution platform make me confident in decision making.	.793		
REV4	What mobile apps to download is affected by users' reviews of the apps.	.719		0.812
REV5	I am interested in mobile apps used by people close to me.	.653		
REV6	I am willing to use mobile apps recommended by people close to me.	.383		
COST	**Perceived Cost-Effectiveness of mobile apps**		0.815	
COST1	Mobile apps meet my need for a reasonable price.	.584		
COST2	Mobile apps deserve the current price range.	.695		
COST3	I find the overall price of mobile apps inexpensive.	.761		
COST4	I have saved a lot of money since I have used mobile apps.	.754		
COST5	Mobile apps are valuable for me in my life.	.539		
COST6	Generally, I find mobile apps cost-effective.	.779		
INT	**Intention to Use mobile apps**		0.842	
INT1	I intend to use mobile apps frequently.	.740		
INT2	I intend to use mobile apps whenever appropriate.	.739		
INT3	My general intention to use mobile apps is high.	.645		
INT4	I will continue to search mobile apps that I am interested in.	.859		0.847
INT5	I will continue to use mobile apps in the future.	.731		
USE	**Actual Mobile Apps Usage**		-	
	How often do you use mobile apps?	.952		

In summary, three components, which are noted as independent variables, are extracted by factor analysis. In addition, all items in dependent variables are homogeneously loaded in 2 single components respectively, which results to five components in total. Besides, the χ^2 value of Bartlett's tests for both independent and dependent variable were all significant ($p < 0.001$) implying that those factors are significantly usable for this study. The result, along with the internal consistency from the reliability test, has ensured the reliability and the usability of measurement items and involved factors for the regression analysis stage.

4.4. *t*-test and Analysis of variance (ANOVA)

The *t*-test analysis result (as shown in Table 4) exhibits no difference between different genders (male and female) of the smartphone users in term of their intentions (M= 3.8914 vs 3.9149; t = -0.272; $p_{2\text{-tailed}}$= 0.786) and actual behavior toward the mobile apps usage (M= 3.99 vs 4.09; t = -1.266; $p_{2\text{-tailed}}$ = 0.206). The mean scale also indicates a slightly higher level of female users' intention and actual usage than those of male counterparts.

In case of age, since the majority of respondents was under 25 years old (91.44%), the researcher decided to regroup the age groups again, forming to two major age groups, which are "Under 25 years old" and "25 years old and above". The reason is to examine the difference between two major groups of age in the research population. Result from Table 4 shows that there are differences between the two groups of user's age in relationship toward other users' reviews on distribution platforms (M= 4.1411 vs 3.9467; t = 3.027; $p_{2\text{-tailed}}$ = 0.003) as well as their intentions to use mobile apps (M= 3.9333 vs 3.5760; t = 2.340; $p_{2\text{-tailed}}$ = 0.020). The analysis also emphasizes that users who are under 25 are paying more attention in the reviews about the apps by other users and use them as one the important antecedents to make the app downloading decisions. This result reflects the fact since there are too many apps in the market and the platform's review functions provided by the distributors now play important role to help users get the right apps they needs which are highly recommended by other users.

In order to measure the differences amongst different groups of total hours user spends daily on apps usage, researcher reform the group into two major groups, which are "less than two hours per day" and "more than two hours per day". Result from t-test analysis shows that there are

differences between the two groups of user's daily apps usage in relationship to their intention to use the apps (M= 4.0457 vs 3.7246; t = 3.004; $p_{2\text{-tailed}}$ = 0.000) and their actual behavior (M= 4.32 vs 3.69; t = 1.945; $p_{2\text{-tailed}}$ = 0.000). Specifically, the result shows that users who spend more than two hours per day in browsing apps on their smartphones have higher intention to use the mobile apps in general.

Table 4. Results for *t*-test

Demographic	Variable		Levene's Test for Equality of Variances F	Sig.	*t*	Sig. (2-tailed)
Gender (*Male* vs *Female*)	INT	Equal variances assumed	1.089	.298	-.272	.786
		Equal variances not assumed			-.273	.785
	USE	Equal variances assumed	.149	.700	-1.266	.206
		Equal variances not assumed			-1.271	.205
Age (*Under 25* vs *More than 25*)	REV	Equal variances assumed	.449	.503	3.027	.003
		Equal variances not assumed			3.386	.002
	INT	Equal variances assumed	1.110	.293	2.340	.020
		Equal variances not assumed			2.227	.034
Daily apps usage (*Less than 2 hours per day* vs *More than 2 hours per day*)	INT	Equal variances assumed	3.004	.084	-3.791	.000
		Equal variances not assumed			-3.752	.000
	USE	Equal variances assumed	1.945	.164	-9.047	.000
		Equal variances not assumed			-8.877	.000

As the longer time people use smartphones, the more experience they get, user's time of using smartphones is considered as one of key information reflecting user's habit in their actual mobile app usage. The ANOVA analysis was conducted to test whether user's smartphone using time have relationship with their intention and actual mobile apps usage or not. Result of the analysis was summarized in the table below:

Table 5. Result of ANOVA for Smartphone use time

		N	Mean	F	Sig.
INT	Less than 12 months	89	3.7371	3.761	.024
	About 12-24 months	56	3.8964		
	More than 24 months	147	4.0054		
USE	Less than 12 months	89	3.94	13.109	.000
	About 12-24 months	56	3.73		
	More than 24 months	147	4.22		
N = 292					

Result from table 5 implies that there are differences amongst the groups of user's smartphone use time regarding to their intentions to use mobile apps (M= 3.7371, 3.8963 and 4.0054, F= 3.761, $p < 0.05$) and their actual apps usage (M= 3.94, 3.73 and 4.22, F= 13.109, $p < 0.05$). Specifically, the analysis indicates that users who use smartphones for more than 24 months have higher intention to use mobile apps than other groups of smartphone use time. This finding supports to previous study of Rahmati and Zhong (2009) having pointed to the possibility of an initial different adoption process during the short and long-term usage. This reflects the fact that the more time user engage in using their smartphone, the more experience they learn from them, and therefore, easily get perceived values as well as attentions in deciding to use a certain apps.

4.5. Regression results

Table 6. Pearson Correlation between factors

		ATT	REV	COST	INT	USE
ATT	Pearson Correlation	1				
	Sig. (2-tailed)					
REV	Pearson Correlation	.426**	1			
	Sig. (2-tailed)	.000				
COST	Pearson Correlation	.367**	.420**	1		
	Sig. (2-tailed)	.000	.000			
INT	Pearson Correlation	.624**	.456**	.543**	1	
	Sig. (2-tailed)	.000	.000	.000		
USE	Pearson Correlation	.233**	.144*	.321**	.487**	1
	Sig. (2-tailed)	.000	.014	.000	.000	

N = 292

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The output of Table 6 illustrates correlations between the variables of user's attitude, user's reviews, user's perceived cost-effectiveness, user's intention to use mobile apps and their actual apps usage. In summary, result from Pearson Correlation presented the significant correlations of all five factors included in the research framework. All the correlations are significant either at the 0.01 level or the 0.05 level (2-tailed). In addition, all Pearson correlation values are positive ($p < 0.05$). This indicates that there is a statically significant correlation between any pair of variables in the proposed research framework; and all the correlations are positive. Thus the regression analysis was used to examine hypotheses of the model concept. More precisely, This study found significant influences of user's attitude, user's reviews and user's perceived cost-effectiveness on their intention to use mobile apps; and significant influence to smartphone user's actual mobile app usage by their intention.

Table 7. Summary of hypotheses testing results

Hypothesis		Beta	Sig.	Result
H1	User's attitude toward using mobile Apps directly affects intention to use mobile Apps.	0.451	0.000	Supported
H2	User review about mobile Apps has a direct influence on intention to use mobile Apps.	0.128	0.008	Supported
H3	User's perceived cost-effectiveness about mobile Apps has a direct influence on intention to use mobile Apps.	0.324	0.000	Supported
H4	User's intention to use mobile Apps directly affects their actual use of mobile Apps.	0.487	0.000	Supported

5. Findings and Implications

This chapter recaps the findings of this study inferred from the analysis result, as well as giving some theoretical and managerial implications for researchers and practitioners in mobile Apps industry.

5.1. Findings

This study involves several variables that are expected to have significant influences on smartphone user's intention to use mobile Apps and their actual mobile Apps usage, throughout

which giving the extended understanding about smartphone Apps industry in Vietnam. As shown in the result analysis section, the intention of smartphone user is significantly affected by their attitude towards the Apps and their perceived cost-effectiveness about the Apps as well as the reviews from other users. Firstly, user's attitude has directly positive effect on their intention to use mobile Apps. Previous studies have emphasized the causal role of attitude to their behavioral intention to use technology and reported the significant influence and important role of user's attitude in defining their intention whether to use or not to use the Apps. Since the attitude leads to behavioral intention to use (accept) the technology, and thus generates the actual usage behavior, this finding is consistent and give supports for prior research about smartphone users or mobile Apps in the literature. Secondly, reviews from other users about the mobile Apps have positive influence on user's intention to use the Apps. As a concept of electronic Word-of-Mouth, user reviews can be consulted by other users about a certain Apps even after a long period of time. Result from this study also finds that user's reviews are considered by users as critical cues for their intention to download and use the Apps. The main reasons for users to refer Apps reviews from others is because they want to collect or gather the information about the Apps by consulting the experience of other users who had tried the Apps before, to support or confirm a previously made decision. Although sometimes users just search and read the reviews for fun without any real intention to use the Apps, this kind of action can even have influence on their future decisions to download and use the Apps.

Furthermore, this study finds that user's intention to use mobile Apps is also affected by their perceived cost-effectiveness of using the Apps. Luarn and Lin (2005) found that some service consumers, in this case is Apps users, have confirmed that financial considerations might influence their behavioral intention to use and, therefore, user's perception of cost-effectiveness plays an important role in their decision-making processes and judgments of downloading and using the Apps. It is also worth noting that perceived cost-effectiveness is a significant motivator for users of mobile Apps. However, in contrast to a finding after reviewing literature by Venkatesh et al. (2012) indicating that in a consumer context, women are likely to pay more attention to the prices of products and services, and will be more cost conscious than men, this study finds no significant difference between two groups of gender in term of their perceived cost-effectiveness of the mobile Apps. Most importantly, as expected, this study finds a

significant influence to user's actual usage by their behavioral intention. Actually, the behavioral intention to use a particular technology has been more frequently measured than its actual use and highlighted incidences where the intention–behavior gap called into question the predictive power of TAM when behavioral intention was used to evaluate technology acceptance (Lim et al., 2011). This gap occurs when users indicate that they intend to adopt the technology but end up not doing so. It means that in some cases, user's intention does not lead to an actual behavior at all. This study fulfills the gap by figuring out the direct effect of an individual intention on their actual behavior.

Additionally, this study also finds some critical key points about Vietnamese smartphones user's usage patterns about mobile Apps. Catching up with the technology trends worldwide, users in Vietnam also put more efforts in browsing social network Apps category, since they are able to connect with their networks and even relax via these Apps. Besides, there are some other Apps categories that are popularly used in Vietnam such as entertainment and references, and games. The study also finds that there is difference among ages in term of referring other user's reviews to use mobile Apps. Because younger individual are more sensitive with technology and easily affected by social norms than older one, this study finds that users under 25 years old are influenced from the reviews by other users than those who are above 25 years old. Another finding is that users who spend more than two hours per day in browsing apps on their smartphones have higher intention to use the mobile apps in general; and those who use smartphones for more than 24 months have higher intention to use mobile apps than other groups of smartphone use time. This reflects the fact that most people tend to carry their mobile phones with them at all times, even at night (Ofcom, 2013). The ease and ready access to apps running on a smartphone could be a reasonable explaination for this kind of engagement.

5.2. Implications

In previous sections, the usage patterns of smartphone Apps and conceptual framework were investigated, and observations from this study have important implications for the smartphone community. The results of this study have several practical and theoretical implications for researchers as well as developers and marketers in the field of smartphone Apps. In this section, the implications were discussed in both theoretical and practical viewpoint from the findings.

5.2.1. Theoretical implications

From a theoretical point of view, this study has served to widen understanding of the factors influencing mobile Apps usage from the perspective of smartphone users. More specifically, this study provides understanding of measurement framework that includes user's attitude, user's reviews, user's perceived cost-effectiveness, which have significant influences to user's intention to use mobile Apps, as well as the relationships among these factors. Many recent studies on smartphone Apps have identified antecedents affecting user's behavioral intentions to use the Apps (Shin, 2009; Gurtner et al., 2014; Kim et al., 2014). This study, in supporting for this line, also finds the same results. Furthermore, since user's actual usage did not receive much attention in the literature, this study also introduces the influence of behavioral intention to the actual usage of smartphone user in term of mobile Apps, broadening the notable concept as measuring the actual usage of technology adoption in general, and particularly in case of mobile Apps. Particularly, this study provides understanding about the intention-behavior linkage by emphasizing the direct influence of user's behavioral intention on their actual usage, giving evidence to clarify this fuzzy relationship. As supporting for most of studies in the literature, results from this study suggest that an individual's actual usage (or technology acceptance) is predicted by their intention to use (or to adopt) that kind technology; and therefore, argues against the findings from study of Lim et al. (2011) that discovered no significant relationship between these two factors. Consequently, results of this study fulfill the gap in the literature that suggests an assumption of the important existence of "actual usage" variable in a modified-TAM conceptual framework in study on technology acceptance.

5.2.2. Practical implications

This study further provides some practical implications for the development, management and marketing of mobile Apps via smartphone industry. The result from this study suggests that it is critical to understand the usage of mobile Apps for content providers (Apps owners) to generate, optimize, and deliver content, and for app developers to implement efficient programs to gain the market share in such competitive but high profitable and potential market. Since result from this study shows a high adoption of young smartphone users who are less than 25 years old, developers can infer their usage patterns and browsing habits to create suitable Apps that meet

the demand. Additionally, recommendations about related Apps created by the same owner can be engaged suitably in the Apps for further browsing in case user has interested in.

With the increasing importance of mobile usage overall and the popularity of mobile Apps, it's clear that businesses need a strategy to assess whether a mobile App will give the best returns. In case of business Apps, it just obviously shows that it is worth while providing customers with an App to help them deal with their tasks and encourage them to buy or use services offered by the business. Firstly, by pointing out the significant relationship between user's reviews and user's intention to use mobile Apps, this study suggests that there should be in-App statements which suggest users to rate and reviews the Apps not only for Apps enhancement, but also for gaining reputation in the distribution platforms. It is understandable that the more famous the Apps are, the more the increase in Apps download and usage is. Secondly, an important issue that needs be taken is that management should identify the right price strategy. As indicated from this study, user's perceived cost-effectiveness about the Apps is also significant influence their intention to use the Apps, this study suggests a serious consideration from management in putting more efforts in providing effective features in the Apps to attract users to download and use them. Moreover, managers should consider about providing free Apps, paid Apps or both. As a trend nowadays while many Apps providers include in-app purchase strategy in their products, the competition among similar Apps has become more struggle. Free apps may create a barrier against downloading paid apps if users want to save their money and are satisfied with the free apps providing similar features despite certain limitations, which might lead to the deduction in both revenue and profitability.

For marketers, this study emphasizes the need to pay close attention to the behavior of their target users to map out the ecosystem of the apps they use on a daily basis. Benchmarking against similar Apps to assess user's level of usage should be taken in consideration for Apps enhancement. From usage pattern shown in this study, it is crucial that marketers should be the one who clearly understand about their target users. Besides, in order to gain reputation to attract users, marketers should focus on increase positive reviews from users about the Apps as well as reduce negative ones as much as possible due to the important role of those reviews in user's intention to download and use the Apps.

6. Conclusion

Global trends like an increasing amount of knowledge, creativity and innovation related work, lead the market for mobile Apps to a continuous expansion at an unprecedented speed. However, up to now, it remained unclear which factors are relevant for technology acceptance and adoption of mobile Apps. Additionally, while previous studies about mobile technology acceptance just mostly focused on user's behavioral intention, the intention-behavior linkage still inconclusive, this study, thus, fills these two gaps in the literature and provides insight into a new field of technologies (i.e., mobile Apps). This study integrates a variety of enabling and inhibiting factors, such as user's reviews about mobile Apps and user's perceived cost-effectiveness about the Apps, in a theoretically sound and empirically tested TAM-based model. Moreover, utilizing the exploratory factor analysis and regression analysis, this study investigated that user's reviews about mobile Apps and their perceived cost-effectiveness about the Apps have significant influence to their intention to use the Apps; and that users from different generations have different intentions for actual usage of new mobile Apps in case of Vietnam smartphone users.

Result from this study finds that user's attitude, user's reviews and user's perceived cost-effective about mobile Apps has directly positive influences on their intention to use mobile Apps. Since these are major antecedents of user's behavioral intention in term of technology acceptance, they are reported to have significant influences and play important role in defining the user's intention whether to use or not to use the Apps. This finding is consistent and give supports for literature about smartphone users in case mobile Apps usage. In fact, individual often adopt the technology when they have more willingness to do so. This study also finds user's actual usage is affected directly by their behavioral intention, which provides evidence to clarify the fuzzy linkage between behavioral intention and actual usage. Besides, this study finds there are differences difference among ages and use time when referring other user's reviews to use mobile Apps. It is indicated in this study that users who are under 25 years old more sensitively affected by user's reviews in the Apps distribution platform; and that users who use smartphone longer might have more experience in intensively involving download and use mobile Apps.

This study also provides some theoretical and practical implications. First of all, this study examined and proved the existence of the "actual usage" variable in TAM-based theoretical framework. Research about smartphone or mobile Apps therefore can do the same way without any confuse about intention-behavior linkage to provide theoretical insights. Secondly, managers engaging in innovation, technology foresight and corporate development activities in the field of mobile Apps should take the results of the present study into account. Since perceived cost-effectiveness is the dominant influencing factor for the user's intention to use mobile Apps, this feature needs particular attention. This study suggests that managers should find the right strategy to set up right price-orientation in the Apps development. Since the market is struggle and competitive, offering suitable Apps providing appropriate features is important. Free Apps, paid Apps or in-app purchase strategy should be carefully considered to gain as much profit from the market as possible. Marketer can also take this study in account for market reference for the target users' selection. This study also suggests that marketer should pay attention in generating positive reviews about the Apps since mobile Apps users' intention are likely to be affected by reviews displayed in the distribution platform.

This study also has some contributions. Empirical finding from this study provides insights to the literature on smartphone and mobile Apps industry by clarify the fuzzy conclusion about relationship between behavioral intention and actual usage of technology adoption. Since this study support for previous studies indicating the significant influence of behavioral intention on actual usage, and argues against those studies with a weak or non-significant results, understanding about actual usage of technology acceptance could be widened in the research field of mobile Apps. This study also contributes to the mobile Apps market insights by providing some demographic information about Vietnamese Smartphone users in term of their habits about using mobile Apps. Those useful findings can help both academic and practitioners in developing in such potential and high-profitable market.

Despite critical findings and contributions, a number of issues still remain in the study to be addressed in the future. Firstly, as same as other adoption model studies, there is a incomplete that additional significant factors have not been investigated in this study. Multi-relationships involving more factors such as self-efficacy, perceived enjoyment and compatibility might

support more strongly for the literature about mobile Apps. Secondly, since user's actual usage of mobile Apps was measured with only one item in this study, which may affect the construct reliability and validity as well as the findings of this study. The reliability of future research can be enhanced by adding more items to measure the construct. Thirdly, since different mobile Apps have different functions depending on different technologies that may have different effects on user's intention and actual behavior, another limitation of this study is that the study does focus on a specific type of mobile Apps. Future research, therefore, may examine the antecedents affecting user's acceptance of a particular Apps or a certain type of mobile Apps which can lead to more theoretical and scientific contributions. Lastly, the findings and their implications as well as discussion were only obtained from this study that just investigated a particular technology and targeted a specific user group in Vietnam perspective. Investigation other kinds of technology such tablets and phablets should be considered in the future. Continued research can also involve the issue through a cross-culture comparison perspective to extend understanding about mobile Apps usage.

References

1. Agrebi, S., & Jallais J. (2015). Explain the intention to use smartphones for mobile shopping. ***Journal of Retailing and Consumer Services***, *22*, 16–23.

2. Agyeman, P., Desgrandchamps, D., Vaudaux, B., Berger, C., Diana, A., Heininger, U., Siegrist, C. A., & Aebi, C. (2009). Interpretation of primary care physicians' attitude regarding rotavirus immunisation using diffusion of innovation theories. ***Vaccine***, *27*(35), 4771–4775.

3. Aizstrauta, D., Gintersa, E. & Eroles, M. A. P. (2015). Applying Theory of Diffusion of Innovations to Evaluate Technology Acceptance and Sustainability. ***Procedia Computer Science***, *43*, 69–77.

4. Ajzen, I. (1991). The theory of planned behavior. ***Organizational Behavior and Human Decision Processes***, *50*, 179-211.

5. Appota (2013). ***Pocket Guide for Vietnam Mobile Market***. Retrieved April 16, 2015 from http://www.slideshare.net/appota/pocket-guide-for-vietnam-mobile-market

6. Ayeh, J. K., Au, N., & Law, R. (2013). Predicting the intention to use consumer-generated media for travel planning. ***Tourism Management***, *35*, 132–143.

7. Bagozzi, R. P. (2007). The legacy of the Technology Acceptance Model and a proposal for a paradigm shift. ***Journal of the Association for Information Systems***, *8*(4), 244–254.

8. Bauer, H. H., Barnes, S. J., Reichardt, T., & Neumann, M. M. (2005). Driving consumer acceptance of mobile marketing: A theoretical framework and empirical study. ***Journal of Electronic Commerce Research,*** *6*(3), 181-191.

9. Benlian, A., Titah, R., & Hess, T. (2012). Differential Effects of Provider Recommendations and Consumer Reviews in e-Commerce Transactions: An Experimental Study. ***Journal of Management Information Systems***, *29*,237–272.

10. Chan, K. Y., Gong, M., Xu, Y., & Thong, J. (2008). Examining user acceptance of SMS: An empirical study in China and Hong Kong. ***Pacific Asia Conference on Information Systems (PACIS) Proceedings***. Paper 294.

11. Chen, L. D., Gillenson, M. L., & Sherrell, D. L. (2002). Enticing online consumers: an extended technology acceptance perspective. ***Information & Management***, *39*(8), 705–719.

12. Cheong, J. H., & Park, M. C. (2005). Mobile Internet acceptance in Korea. ***Internet Research***, *15*(2), 125–140.

13. Chua, P. & Hu, P. J. (2001). Information technology acceptance by individual professionals: a model comparison approach. ***Decision Sciences***, *32*(4), 699-720.

14. Cummings, E., Borycki, E. M., & Roehrer, E (2013). Issues and considerations for healthcare consumers using mobile applications. ***Studies in Health Technology and Informatics***, *183*, 227 – 231.

15. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. ***Management Information Systems Quarterly***, *13*(3), 319–340.

16. Davis, F. D., Bagozzi, R. P., & Warshaw, P. R., (1989). User acceptance of computer technology: a comparison of two theoretical models. ***Management Science***,*35*(8), 982-1003.

17. Falaki, H., Mahajan, R., Kandula, S., Lymberopoulos, D., Govindan, R., & Estrin, D. (2010). Diversity in smartphone usage. ***Proceedings of the 8th international conference on Mobile systems, applications, and services***, 179-194.

18. Fishbein, M., & Ajzen, I. (1975). ***Belief, attitude, intention, and behavior: An introduction to theory and research***. Reading, MA: Addison-Wesley.

19. Gentry, L., & Calantone, R. (2002). A comparison of three models to explain shop-bot use on the web. ***Psychology & Marketing***, *19*, 945–956.

20. Golmohammadi, A. R., Jahandideh, B., & O'Gorman, K. D. (2012). Booking on-line or not: a decision rule approach. ***Tourism Management Perspectives***, *2–3*, 85–88

21. Google (2014). ***The Connected Consumer Survey 2014***. Retrieved April 11, 2015 from https://www.consumerbarometer.com/en/graph-builder/

22. Gurtner, S., Reinhardt, R., & Soyez, K. (2014). Designing mobile business applications for different age groups. ***Technological Forecasting and Social Change***, *88*, 177–188.

23. Kaplan, B. (2001). Evaluating informatics applications - some alternative approaches: theory, social interactionism, and call for methodological pluralism. ***International Journal of Medical Informatics***, *64*(1), 39–56.

24. Karjaluoto, H., Mattila, M., & Pento, T. (2002). Factors underlying attitude formation towards online banking in Finland. ***International Journal of Bank Marketing***, *20*(6), 261- 272.

25. Kim, S. C., Yoon, D., & Han, E. K. (2014). Antecedents of mobile app usage among smartphone users. ***Journal of Marketing Communications***, 2015.

26. Kulviwat, S., Bruner, G. C., & Neelankavil, J. P. (2014). Self-efficacy as an antecedent of cognition and affect in technology acceptance. ***Journal of Consumer Marketing***, *31*(3), 190 – 199.

27. Lee, H. S., Kim, T. G., & Choi, J. Y. (2012). A Study on the Factors Affecting Smart Phone Application Acceptance. ***International Proceedings of Economics Development and Research***, *27*, 27-34.

28. Lim, S., Xue, L., Yen, C. C., Chang, L., Chan, H. C., Tai, B. C., Duh, H. B. L., & Choolani, M. (2011). A study on Singaporean women's acceptance of using mobile phones to seek health information. ***International Journal of Medical Informatics***, *80*(12), e189–e202.

29. Liu, Y., & Li, H. (2011). Exploring the impact of use context on mobile hedonic services adoption: An empirical study on mobile gaming in China. ***Computers in Human Behavior***, *27*(2), 890–898.

30. Luarn, P., & Lin, H. H. (2005). Toward an understanding of the behavioral intention to use mobile banking. ***Computers in Human Behavior***, *21*(6), 873–891.

31. Martins, C., Oliveira, T., and Popovič, A. (2014). Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. ***International Journal of Information Management***, *34*(1), 1–13.

32. Middleton, C. (2010). Delivering Services Over Next Generation Broadband Networks: Exploring Devices, Applications and Networks. ***Telecommunications Journal of Australia***, *60*(4), 59.1–59.13.

33. Min, G. (2006). A policy study on the development of the telecommunications equipment manufacturing industry with two empirical studies on mobile data communications service acceptance in China and Hong Kong. Available at http://lbezone.ust.hk/bib/b938226

34. Muk, A., & Chung, C. (2015). Applying the technology acceptance model in a two-country study of SMS advertising. ***Journal of Business Research***, *68*(1), 1–6.

35. Ofcom (2013). ***Communications Market Report 2013***. Retrieved April 17, 2015 from http://stakeholders.ofcom.org.uk/market-data-research/market-data/communications-market-reports/cmr13/international/

36. Okazaki, S., & Barwise P. (2011). Has the Time Finally Come for the Medium of the Future? - Research on Mobile Advertising. ***Journal of Advertising Research***, *51*, 59–71.

37. Pan, Y., & Zhang, J. Q. (2011). Born Unequal: A Study of the Helpfulness of User-Generated Product Reviews. ***Journal of Retailing***, *87*, 598–612.

38. Park, D. H., Lee, J., and Han, I. (2007). The Effect of On-Line Consumer Reviews on Consumer Purchasing Intention: The Moderating Role of Involvement. ***International Journal of Electronic Commerce***, *11*(4), 125–148.

39. Park, N. K. (2010). Adoption and use of computer-based voice over Internet protocol phone service: Toward an integrated model. ***Journal of Communication***, *60*(1), 40–72

40. Park, E., & Kim, K. J. (2014). An Integrated Adoption Model of Mobile Cloud Services: Exploration of Key Determinants and Extension of Technology Acceptance Model. ***Telematics and Informatics***, *31*(3), 376–385.

41. Perez, S. (2015). ***App Usage Grew 76% In 2014, With Shopping Apps Leading The Way***. Retrieved April 11, 2015 from http://techcrunch.com/2015/01/06/app-usage-grew-76-in-2014-with-shopping-apps-leading-the-way/

42. Rahmati, A., & Zhong, L. (2009). Human–battery interaction on mobile phones. ***Pervasive and Mobile Computing***, *5*, 5.

43. Reagan, J. (2002). The difficult world of predicting telecommunication innovations: Factors affecting adoption. In C. A. Lin, & D. J. Atkin (Eds.), ***Communication technology and society***, 65–87. Cresskill, NJ: Hampton Press.

44. Satyanarayanan, M. (2005). Swiss Army Knife or Wallet? ***IEEE Pervasive Computing***, *4*(2), 2-3.

45. Shin, D. H. (2007). User acceptance of mobile Internet: Implication for convergence technologies. ***Interacting with Computers***, *19*(4), 472–483.

46. Shin, D. H. (2009). Towards an understanding of the consumer acceptance of mobile wallet. ***Computers in Human Behavior***, *25*(6), 1343–1354.

47. Shukla, A. (2011). Vietnam Mobile Phone Industry Rolls in Good Times Despite Inflation. ***Asia-Pacific Business and Technology Report***. Retrieved April 16, 2015 from http://www.biztechreport.com/story/1709-vietnam-mobile-phone-industry-rolls-good-times-despite-inflation

48. Teo, T. S. H., & Pok, S. H. (2003). Adoption of WAP-Enabled Mobile Phones Among Internet Users. ***Omega***, *31*,483–498.

49. Tian, N., Xu, Y., Li, Y. F., Abdel-Hafez, A., & Josang, A. (2014). Product feature taxonomy learning based on user reviews. ***In WEBIST 2014 10th International Conference on Web Information Systems and Technologies***, Barcelona, Spain

50. Wai, T. K. (2012). The study of consumer attitudes towards smartphone applications commerce in Hong Kong fashion retail industry. Unpublished master's thesis, The Hong Kong Polytechnic University, Hong Kong.

51. Wei, C. P., Chen, Y. M., Yang, C. S., Yang, C. C. (2006). A semantic-based approach to supporting product feature extraction from customer reviews. ***Proceedings of the fiftyth workshop on e-BUS***, Milwaukee.

52. Wei, P. S., & Lu, H. P. (2013). An examination of the celebrity endorsements and online customer reviews influence female consumers' shopping behavior. ***Computers in Human Behavior***, *29*(1), 193–201.

53. Wonglimpiyarat, J., & Yuberk, N. (2005). In support of innovation management and Roger's Innovation Diffusion theory. ***Government Information Quarterly***, *22*(3), 411-422.

54. Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: toward a unified view. ***Management Information Systems Quarterly***, *27*(3), 425–478.

55. Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the Unified Theory of acceptance and use of technology. ***Management Information Systems Quarterly***, *36*(1), 157-178.

56. Xu, Q., Erman, J., Gerber, A., Mao, Z. Q., Pang, J., & Venkataraman, S. (2011). Identifying diverse usage behaviors of smartphone apps. ***IMC '11 Proceedings of the 2011 ACM SIGCOMM conference on Internet measurement conference***, 329-344.

57. Yi, M., & Hwang, Y. (2003). Predicting the use of web-based information systems: Self-efficacy, enjoyment, learning goal orientation, and the technology acceptance model. ***International Journal of Human-Computer Studies***, *59*, 431-449.

58. Yi, M. Y., Jackson, J. D., Park, J. S., & Probst, J. C. (2006). Understanding information technology acceptance by individual professionals: toward an integrative view. ***Information and Management***, *43*(3), 350–363.