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Appropriation of Wireless Technology: Direct Impacting Factors on the Youth's Adoption Intention and Usage of the Wireless Application Protocol Phone

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Abstract: The main purpose of this study is to suggest a research model that empirically investigates factors impacting the youth's adoption intention and usage of wireless technology. More people are turning to wireless technology as similar trend as when PC was introduced to the market. Most of the wireless technologies are initially used for business purposes. Now, these technologies are more common for our daily-life reasons for various purposes, such as communication, information surfing, protection, etc. Particularly, the youth's adoption of the Wireless Application Protocol (WAP) phone has rapidly increased. Unlike adults, the youth have different reasons of using a WAP phone. However, a study on the adoption of a WAP phone using the youth as a study subject is a scant. Therefore, this study suggests a research model empirically investigating factors impacting the youth's adoption intention and usage of wireless technology; WAP phone in this study. The research model was developed based on the well-known Technology acceptance model and adds new additions and casual relations, such as Perceived safety, Enjoyment and Peer influence. The data, collected from 327 subjects, were tested against the model. The results of the study showed that all variables in the research model had a significant influence on other variables. The implications of the findings suggest a new theoretical framework for future IS/IT research and offer suggestions that the marketer of wireless technology should consider regarding the technology.

Key words: Technology adoption, individuals, behaviors, WAP phone

INTRODUCTION

Many technological products and services for both business and home users introduced in a market have many capabilities and functionalities. Wireless technology, including digital cameras, cellular, Personal Digital Assistants (PDAs), laptop computer, and m-Commerce, are integrating together and allowing users to access multiple types of information virtually anytime-and-anywhere. In other words, wireless capabilities are being put up into these devices allowing unlimited access to all types of information such as music, news, sports, stock trading, financial reports, etc. In such a trend, technologies most people use are either mobile or wireless, or a combination of both. These technologies have far more capabilities and functionalities when compared to those developed in past years. In fact, it could be possible that all technologies in the near future may be mobile, wireless or both.

Due to their affordability, technology infrastructure, and popularity, wireless technology provides several benefits as an alternative to voice and text communication services (Waverman *et al*., 2005). According to Telecom Trend International, the use of wireless technology has dramatically increased over the last several years; for example, the number of 94.9 million m-Commerce users in 2003 is projected to grow to 1.67 billion by 2008. As a result, the revenue from m-Commerce will increase globally from $6.86 billion in 2003 to over $554.37 billion in 2008. In addition, according to Virki (2007), the total number of mobile phone users in the world was estimated at 2.14 billion in 2005. The subscriber count reached 2.7 billion by the end of 2006, and 3.3 billion by November, 2007, thus reaching an equivalent of over half the planet's population. Around 80% of the world's population has access to mobile phone coverage, as of 2006. This figure is expected to increase to 90% by the year 2010.

Responding to this growing trend of wireless technology, many academic researches (Kauffman and Techatassanasoontorn, 2005) have been conducted to investigate users' attitudes and behaviors to this technology in general. However, as users of such wireless technology become younger, there is a lack of research examining key factors affecting the adoption of such technology at the youth's point of view. It is important to understand the youth's attitude and behavior on such technology since they are a big portion of wireless technology market. Therefore, the main purpose of this

study is to empirically investigate several determinants affecting the youth's adoption of wireless technology. The technology used for this study is a Wireless Application Protocol (WAP) phone. The WAP phone is a mobile phone capable of Internet connectivity. A WAP phone can be used to do things like check email, send messages, track stocks, access news and sports headlines, or download music. This study used the Technology Acceptance Model (TAM) (Davis, 1989) as a research framework. TAM is one of the most influential models in technology acceptance research. Starting with TAM, the study proposes additional factors associated with youth's values in terms of adopting and using a WAP phone. These factors include perceived safety, enjoyment, and peer influence, influencing behavior intention to use the WAP phone that in turn affects actual use of the WAP phone.

TAM AND RELATED EMPIRICAL STUDIES

Technology Acceptance Model (TAM) is a model that has been empirically proven to have a high level of validity. Davis (1989) developed TAM based on the Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) in order to examine a user's behavior. TAM posits that the user acceptance of IS is determined by two key beliefs; Perceived Usefulness (PU) and Perceived Ease of Use (PEU). PU is defined as the degree to which a person believes that using a particular system would enhance his or her job performance and PEU as the degree to which a person believes that using a particular technology will be free from effort (Davis, 1989). These two beliefs influence a user's Attitude toward Using (A), which determines Behavioral Intention (BI) to use a system in association with PU. Then, IS usage was determined by BI. Finally, PEU influenced PU. Figure 1 describes Fred Davis's TAM model.

Throughout the years, research in technology acceptance has flourished. Particularly, TAM has received extensive empirical support. Many studies have validated TAM with different applications and technologies, for the purpose of presenting empirical

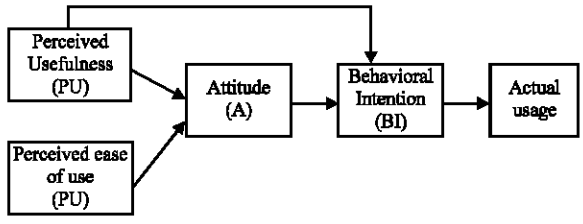

Fig. 1: Technology acceptance model (Davis, 1989)

support regarding the relationships between perceived ease of use, perceived usefulness, and system use (Davis and Venkatesh, 1996; Horton *et al*., 2001). Perceived usefulness appeared to be a more important factor than perceived ease of use. Furthermore, a large number of replications (Hendrickson *et al*., 1993; Szajna, 1994) and other studies (Agrawal *et al*., 2000; Anandarajan *et al*., 2002) have validated perceived ease of use in connection with different applications and technologies, such as Windows, Lotus, and the World-Wide-Web.

It is surprising to note that a few academic studies, using the TAM model, have been conducted in a wireless technology acceptance study, especially the youth's adoption of wireless technology. The main reason for the lack of academic research might be due to the fact that while technology is a recent trend, it has been adopted rapidly by individuals. Thus, most wireless technology adoption research in the IS literature present earlier studies or have simply retested TAM with different technology. For example, Danaher *et al*. (2001) modified TAM so as to examine the extent of the adoption of cellular phone technology. They retested TAM and other variables, such as social pressure, and apprehensiveness in IS literature, with new technology. Liang *et al*. (2003) extended TAM to predict actual PDA usage within a healthcare setting. They retested TAM and other constructs, for example, personal innovativeness, compatibility and supports from technology acceptance literature. The results supported the fact that perceived usefulness and perceived ease of use were the main factors that determined actual PDA usage by health professionals. In addition, personal innovativeness directly and indirectly affected actual PDA usage through perceived ease of use. Perceived usefulness mediated perceived ease of use, job relevance, and compatibility for actual PDA usage. Supports also affected the actual PDA usage via perceived ease of use.

Pedersen (2005) suggested the extended TAM, with subjective norm and behavioral control into a decomposed TPB, in order to examine the reliability of these early adoption models for mobile wireless service, m-Commerce. The study started an empirical test with the simple TAM model, then added subjective norm, and finally behavioral control was included. The findings supported a need to extend TAM along with behavioral control, but there was less support for extending TAM with subjective norm. When both subjective norm and behavioral control were added to TAM, however, only subjective norm had a significant effect regarding the use of intention in TAM. Given these important studies in TAM research, this study proposes new variables and casual relations that have not been empirically validated in wireless technology acceptance study.

RESEARCH MODEL AND HYPOTHESES

Figure 2 describes the proposed research model. By using TAM as the starting point, the model incorporates additional theoretical variables, perceived safety, enjoyment, and peer influence. From the youth's viewpoint, these variables are more important factors than others in deciding their attitude and behavior toward certain technology. The definition of each of these constructs and the development of the theoretical rationale for the causal relationships of the model are discussed below.

Perceived Safety (PS): As society becomes more complex and unpredictable, crime rates and the number of emergencies increase. Personal safety has become a major concern for many individuals. Even organizations are using a kind of technology to protect important data and to prevent emergencies. Individuals even carry and wear technologies to protect themselves from emergency. Previous studies have examined security issues associated with technology and applications, for instance online transaction risk (Jarvenpaa and Tractinsky, 1999) and the consumer perception of risks in adopting and using a product (Dowling and Staelin, 1994). However, there have been few studies investigating the effect of individuals' perception of personal safety concerning the adoption and use of new technologies. Therefore, this study theorizes perceived safety as a new variable, which influences users' behavioral intention to use the WAP phone. Perceived safety is defined as an individual' perception regarding the extent to which the WAP phone provides an individual with safety functions.

The psychological drive to use the WAP phone may be positive because of the anytime-and-anywhere communication and connectivity. As more people are concerned about their personal safety, they perceive the technology providing security features. With such technology, a user, especially the youth or younger people, can communicate when faced with an emergency. Davis (1995) claimed that giving a WAP phone as gift is considered by family as a means to ensure safety. Furthermore, youth safety or security is one of the appropriation criteria of mobile wireless technology, especially mobile wireless phones (Carroll *et al*., 2002). Carroll and Hartnell-Young (2004) confirmed the results of their earlier study (Carroll *et al*., 2002) by claiming that many parents buy WAP phones for their children as a safety measure: parents can communicate with their children anytime, anywhere to check on them. This technology also provides children with help in an emergency. For teen users, the WAP phone is more associated with personal safety and convenience. In this context, wireless communication devices are more than just being convenient. Such devices represent a safety instrument, which eventually affects the adoption of the WAP phone. Therefore, the study considered perceived safety to be an important variable in the adoption and use of WAP phone. Thus, the first hypothesis is:

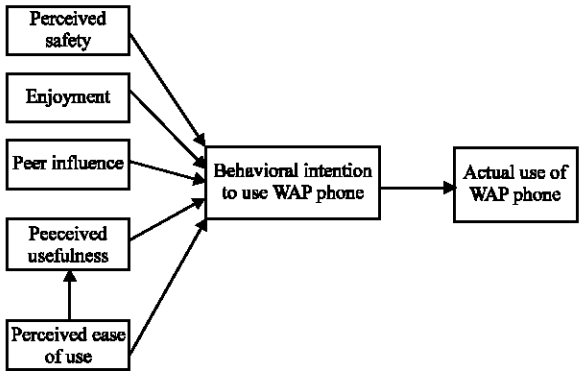

Fig. 2: Research model

Hypothesis 1: Perceived Safety (PS) has a positive effect on Behavioral Intention (BI) to use a WAP phone

Enjoyment (E): Most digital wireless technology provides entertainment features, such as MP3, DMB, video, camera, and game. Some users make adoption decision based on such features because their priority on choosing technology is based on its additional features. Therefore, the research model includes enjoyment as a new addition. In this study, enjoyment is defined as the degree to which the activity of using the WAP phone is perceived to be enjoyable in its own right, apart from any performance consequences anticipated (Sweeney and Soutar, 2001; Venkatesh and Brown, 2001). The youth will be motivated to do or do again an activity that is enjoyable more as compared to the same activity not enjoyable.

Many studies claim that enjoyment of IT is an important factor particularly in the workplace (Webster and Martocchio, 1992). Now, such enjoyment of IT is not limited in the workplace since the youth's adoption of IT has been increased. Furthermore, Heijden (2003) claimed that not only extrinsic factors, including ease of use and usefulness, but also intrinsic factors such as enjoyment has a crucial impact on IT usage for personal purposes. Particularly, young people do not have any reasons related to a job in deciding their behaviors. They act based on what they can enjoy with certain technology.

Therefore, to test the youth's behavioral intention to use a WAP phone influenced by enjoyment, the second hypothesis is:

Hypothesis 2: Enjoyment (E) has a positive effect on Behavioral Intention (BI) to use a WAP phone

Peer Influences (PI): Peer influences or superiors' influences are an antecedent of subjective norm that was a key social factor in TRA. Many studies (Mathieson, 1991; Taylor and Todd, 1995) tap into peer influence via subjective norm, which is defined as an individual's perception that most people important to him/her think that he/she should or should not perform the behavior in question (Fishbein and Ajzen, 1975). In this study, peer influence refers to the degree of pressure that individual end-users feel from peers or superiors in the same social group or workplace in deciding about the use and adoption of the WAP phone. Peer influence is an interpersonal influence within a group. Regardless of individuals' intention or willingness in adopting a WAP phone, he/she may have to adopt a new technology because of social trends and phenomenon. In the proposed model, there is a direct effect of peer influence on behavioral intention. The rationale for the direct effect is that each individual may decide on performing a certain behavior, even if the behavior is not in his/her favor, if he/she believes that others who are important referents in the same social group think they should, and he/she is adequately motivated to comply with the referents.

In literature, there are mixed results on the effect of subjective norm on behavioral intention to use technology. For example, Mathieson (1991) found that there was no significant effect of subjective norm on behavioral intention whereas Taylor and Todd (1995) found an opposite result. Davis *et al.* (1989) claimed that subjective norm did not have a significant effect on behavioral intention over and above perceived usefulness and perceived ease of use so that they omitted it from the original TAM. However, they acknowledged the need for further research on the impact of social influences on behavioral intention to use certain technology.

In wireless technology research, some found a significant effect of peer influence on behavior intention. For example, Pedersen *et al.* (2003) studied the adoption of mobile service-Multimedia Messaging Service (MMS). They claimed that users discover text messaging to be instrumental in social organization because all other members of their social network use it, but still feel little social and peer pressure towards using text messaging services as a norm. In addition, the study of cellular adoption by Kwon and Chidambaram (2000) concluded that the age of the cellular users had a strong and significant association with the social pressure they faced to use cellular telephones.

In addition, peer influence has been validated as a key factor for adoption of many other technologies. For example, Chiasson and Lovato (2001) studied the decision support system adoption for health planning. They reported that the subjective norm is a significant antecedent of information system adoption intention. Morris and Venkatesh (2000) used the Theory of Planned Behavior (TPB) in order to investigate age differences in adoption intentions and the continued use of information technology. They also concluded that the subjective norm influenced people although age and length of exposure moderated the effects. Based on the TPB, it is expected that the subjective norm will have an influence on the intentions of consumers to engage in online transactions. However, peer influence on WAP phone adoption study has not been tested. Therefore, the research model includes peer influence as a new addition. Thus, the third hypothesis is:

Hypothesis 3: Peer Influence (PI) has a positive effect on Behavioral Intention (BI) to use the WAP phone

TAM variables: The research model in this study retains both perceived ease of use and perceived usefulness from TAM. Perceived ease of use and perceived usefulness are different but connected variables. Perceived ease of use is defined as the degree to which a person believes that using the system will be free from effort (Davis, 1989). Perceived ease of use is a direct determinant of perceived usefulness, since all else being equal, the less effort required to use a system, the more using it can increase job performance. Some empirical evidence accumulated over a decade has shown that perceived ease of use is significantly linked to intention, both directly and indirectly via its impact on perceived usefulness (Davis *et al.*, 1989; Venkatesh, 1999). The direct influence proposes that perceived ease of use could be a potential catalyst to increasing the likelihood of user acceptance. The indirect effect explains that the easier a technology is to use, the more useful it can be in the situation where other things are equal (Davis *et al.*, 1989).

Empirical studies (Clarke, 2000; Constantiou *et al.*, 2004), found that ease of use was found to be a significant determinant of using wireless technology. In addition, Venkatesh (1999) claimed that perceived ease of use

should be considered to be an important factor of users' intention to use any emerging information technology. Therefore, to better explain perceived usefulness and its influence to usefulness and intention to use the WAP phone, a pair of hypotheses are proposed:

Hypothesis 4a: Perceived Ease of Use (PEU) has a positive effect on Perceived Usefulness (PU)

Hypothesis 4b: Perceived Ease of Use (PEU) has a positive effect on Behavioral Intention (BI) to use WAP phone

Perceived usefulness is another major determinant of behavioral intention to use in TAM, which is defined as the extent to which an individual believes that using mobile wireless technology will improve her/his job performance (Davis, 1989). Perceived usefulness reflects perceptions of the performance and has been closely linked to outcome expectations, instrumentality, and extrinsic motivation (Davis, 1993). The relationship between perceived usefulness and behavioral intention has a basis in the idea that individual users establish intentions toward behaviors within organization settings if they believe that the system will increase their job performance over and above no matter what positive or negative feelings may be evoked toward the behavior per se.

A significant body of TAM research has shown that perceived usefulness is a strong determinant of user acceptance, adoption, and usage behavior (Hu *et al*., 1999; Venkatesh and Davis, 2000). The ultimate reason that the youth exploit the WAP phone is that they find the technology is more useful for personal reasons than for jobs. Therefore, traditional usefulness cannot be ignored in this study. Thus, the following hypothesis is proposed:

Hypothesis 5: Perceived Usefulness (PU) has a positive effect on Behavioral Intention (BI) to use the WAP phone

Similar to TRA, TAM suggests that information technology usage is determined by behavior intention, but differs in that behavioral intention is viewed as being jointly determined by one's attitude toward using the system and perceived usefulness (Davis *et al*., 1989). This study did not include the attitude variable to simplify the research model. Behavioral intention is the measure of the strength of one's intention to perform a specified behavior (Fishbein and Ajzen, 1975). Frequency of system use (how often) and the volume of system use (how much) by the user are used to measure actual usage of the WAP phone in this study. Similar measures have been used in most of the existing research studies on TAM, including Davis (1989) and Davis *et al*. (1989). Thus, the sixth hypothesis is:

Hypothesis 6: Behavioral Intention (BI) has a positive effect on Actual Use of the WAP phone

MATERIALS AND METHODS

Study context and sample: Off- and on-line surveys with public institutions in Korea were conducted to test the research model and its hypotheses. A total of 373 responses were collected; 46 of these were discarded because of incomplete responses and outside the context of this study. All participants were under 20, ranging from 9 to 19 years old. They represent a racially diverse group with an average age of 14.8. Fifty eight percent of the participants are male. About fifty seven percent of participants have used the WAP phone more than 3 years. Table 1 shows the demographics of the survey respondents.

Procedure and measurement: Items that measure constructs in the TAM model were mainly adopted from prior studies so as to ensure content validity. New constructs in the research model, however, were developed based on IS literature. For example, the three items to measure perceived safety and enjoyment were developed from Parasuraman (2000) and from IS literature on technology appropriation criteria (Carroll *et al*., 2002). Items were modified to measure his/her psychological feeling by possessing a WAP phone. Each individual was

Table 1: Demographic characteristics

Demographic categories	Frequency	Percentage
Age (years)		
9 - 12	69	21.1
13 - 16	104	31.8
17 +	154	47.1
Gender		
Male	187	57.2
Female	140	42.8
Race/ethnicity		
White	78	23.9
Black	82	25.1
Hispanic origin	75	22.9
Asian or Pacific Islander	92	28.1
Educational level		
Elementary school	54	16.5
Middle school	118	36.1
High school	131	40.1
Others	24	7.3
Length of tie using WAP phone		
≤1 year	61	18.7
≥1, ≤2 year	48	14.7
≥2, ≤3 year	32	9.8
≥3 year	186	56.9

asked to indicate his/her extent of agreement or disagreement with various statements concerning the adoption of the WAP phone, on a seven-point Likert-type scale ranging from (1) Strongly Disagree to (7) Strongly Agree for each factor.

RESULTS AND DISCUSSION

Analysis of the measurement model: The measurement models for the constructs were created and tested using Confirmatory Factor Analysis (CFA) because of the confirmatory aspect of the study. AMOS 5.0 was the main statistical tool used in the analysis. To demonstrate a reasonable fit between the data and the research model, first the measurement model fitness was tested. The decision for evaluating the measurement models is based on a number of factors, including Normed Fix Index (NIF), Goodness-of-fit Index (GFI), Adjusted Goodness-of-fit Index (AGFI), Comparative Fit Index (CFI), relative Chi-square (Chi-square/df), and Root Mean Square of Approximation (RMSEA). A very good fit is normally deemed to exist when NFI, GFI and CFI should be greater than 0.90 (Bentler, 1990). Root Mean Square of Approximation (RMSEA) is around 0.1 (Browne and Cudeck, 1993) and AGFI should be greater than 0.80. In addition, the chi-square was not used because it is generally sensitive to sample size (Iwasaki, 2003). Thus, the use of relative Chi-square seems appropriate. The recommended values of relative chi-square range from less than 3 to as high as 5 (Carmines and Mclver, 1981).

The indices for the measurement model with all items (20 items) showed that the data fits well into the model; NFI (0.931), GFI (0.975), AGFT (0.902), and CFI (0.941) were greater than 0.09. RMSEA (0.059) was less than 0.10. Finally, the relative chi-square (1.653) was less than 3.0. The summary of the overall fit indices for the measurement models is shown in Table 2.

Psychometric properties of measures: After purifying the data, reliability and construct validity were conducted to assess the psychometric properties of the measurement model. Reliability test used Cronbach's alpha. Even if there is no set level of alpha regarded as a minimum acceptable level for reliability, the minimum acceptable level of alpha is 0.7 (Teo *et al*., 1999). To assess construct validity, item loading and average variance extracted (AVE) were used. If the items have factor loadings greater than 0.5 regarding their expected factors and less than 0.4 on the others, then construct validity is demonstrated (Cheung *et al*., 2000). The AVE measures the variance captured by the indicators relative to the measurement error, and it should be greater than 0.5 to justify using a construct (Barclay *et al*., 1995). Table 3 shows the results of reliability and construct validity test.

Table 2: The summary of the overall fit indices for measurement model

Model	NFI	GFI	AGFI	CFI	χ^2/df	RMSEA
Measurement model	0.931	0.975	0.902	0.941	1.653	0.059
Recommended value	≥.0.9	≥.0.9	≥.0.8	≥.0.9	≤3.0	≤0.1

Table 3: The results of reliability and construct validity test

Construct	Item	Loading	Cronbach's Alpha	AVE
Perceived safety	PS1	0.871	0.892	0.856
	PS2	0.893		
	PS3	0.852		
Enjoyment	E1	0.799	0.927	0.859
	E2	0.931		
	E3	0.892		
Peer influence	PI1	0.842	0.795	0.861
	PI 2	0.876		
	PI3	0.910		
Perceived	PEU1	0.899	0.889	0.880
Ease of use	PEU2	0.906		
	PEU3	0.870		
Perceived	PU1	0.863	0.931	0.862
usefulness	PU2	0.909		
	PU3	0.858		
Behavioral	PU4	0.889	0.961	0.894
intention	BI1	0.915		
	BI2	0.907		
Actual usage	AU1	0.844	0.978	0.838
	AU2	0.872		

Table 4: The results of the tested hypotheses

Hypothesis	Path	Remarks
H1	PS -----> BI	Supported
H2	E -----> BI	Supported
H3	PI -----> BI	Supported
H4a	PEU -----> PU	Supported
H4b	PEU -----> BI	Supported
H5	PU -----> BI	Supported
H6	BI -----> AU	Supported

Factor loading ranging from 0.799 to 0.931, and all values of AVE are above the recommended value, which implies construct validity is demonstrated. Cronbach's alpha ranges from 0.795 to 0.978 demonstrating internal consistency of all items.

Analysis of the structural equation model: From the primary data (n = 327), the structural equation model was examined to test the relationships among constructs. The results of the structural equation model are presented in Fig. 3. and the hypotheses tests are summarized in Table 4. All paths were significant at different p-values.

This study discovered four findings worthy of mention. First, perceived safety (β = 0.379, t = 4.237, $p<0.001$), enjoyment (β = 0.593, t = 4.922, $p<0.001$), peer influence (β = 0.317, t = 7.148, $p<0.001$), perceived ease of use (β = 0.291, t = 2.263, $p<0.05$) and perceived usefulness (β = 0.273, t = 5.008, $p<0.001$) positively affected a user's behavioral intention to use the WAP phone. Therefore, Hypotheses 1, 2, 3, 4b and 5 were supported. These variables explain 71.9% of variance in behavioral intention to use the WAP phone. Second, as many previous studies have confirmed, perceived ease of use (β = 0.429, t = 7.15) has a significant effect on perceived usefulness.

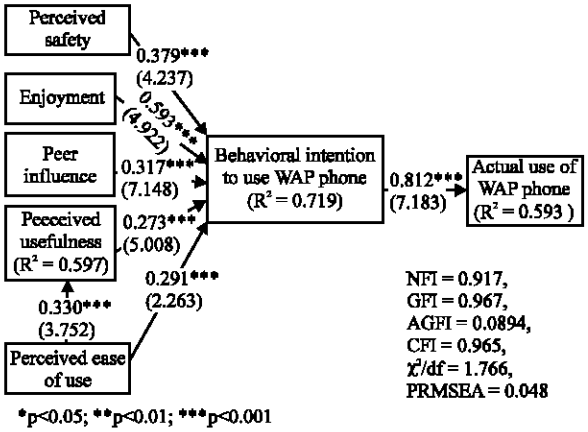

Fig. 3: The results of the Structure Equation Model (SEM)

Thus, hypothesis 4a was supported. It explained 59.6% of variance in perceived usefulness. Finally, as many previous IT adoption researches prove the relationship between behavioral intention and actual usage, behavioral intention to use the WAP phone significantly affected actual use of the WAP phone by youth. The path coefficient between these two constructs was 0.812 ($t = 7.138$, $p<0.001$). Therefore, hypothesis 6 was supported. This result corresponded to prior research regarding technology acceptance. Table 4 shows the results of the hypotheses tested.

CONCLUSIONS

This study suggested the research model that theorizes the youth's behaviors in adopting the WAP phone. Then, the research model was empirically tested to address determinants influencing the youth's adoption and use of WAP phone. Starting with TAM, the proposed model introduced new variables, such as perceived safety, enjoyment, and peer influence. Along with perceived ease of use and perceived usefulness, those new variables affect users' behavioral intention to use the WAP phone, which in turn affects actual use of the technology.

The results of the study garnered new understanding as regards the adoption of the WAP phone by the youth. The data collected generally supported the overall validity of the research model. The proposed hypotheses were supported, and all five variables two explained about 71.9% of variance in behavioral intention. Behavioral intention was largely explained by enjoyment ($\beta = 0.593$, $t = 4922$), implying this variable was the most important reason for the youth having a positive intention toward the WAP phone other than communication that is the main purpose of using the technology. For variance explained in the original TAM model with the WAP phone, perceived ease of use explained 59.7% of variance in perceived usefulness. Finally, behavioral intention explained 59.3% of variance in actual use of the WAP phone. The findings supported the fact that new additions and casual relations in the research model had a significant influence on an individual's intention to use the technology. Consistent with prevailing technology acceptance research, the relationships in the TAM model were significant in this study.

The current study presents important contributions and implications for both IS research and practitioners. For IS researchers, first this study represents crucial theoretical advances in technology acceptance and usage. Particularly, individual perceptions about safety, enjoyment, and peer influence have not been conceptualized in order to explain WAP phone adoption by the youth. Thus, this study developed and validated an instrument to measure these new variables. Second, the findings of this study significantly added to the existing body of knowledge on general technology acceptance, as well as helped to reveal the effects of new technology on human attitude and behavior. Third, this study provided a sound extension of the well-known technology acceptance model, TAM, for future studies associated with wireless subjects.

For IS practitioners, this study highlights additional factors for successful WAP phone development and implementation. New important factors are put forth for IS developers to consider. Second, the findings of this study may provide significant implications for research and development in other topics of wireless technology, specifically Mobile-Commerce (m-Commerce) or Ubiquity Commerce (u-Commerce). By gaining a better understanding of the WAP phone, the findings of this study may contribute to the study of m-commerce or u-Commerce, and other wireless services adoption.

With these contributions mentioned early, there are several different research avenues that could be taken from this study. One such possible research direction could investigate technological influence processes, such as perceived mobility. WAP phone has unique characteristics, for example ubiquity and reachability. Thus, in future research, there could be other variables thought to be associated with the unique technical aspects of the WAP phone. In addition, the research model can be extended to research on the adoption of other wireless technology, for example, m-Commerce or u-Commerce. Since there are few wireless technology adoption studies, many aspects of this technology can be examined, whether they are technical or behavioral aspects.

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