Towards an understanding of the behavioral intention to use mobile knowledge management

Jeung-tai E. Tang
Department of Information Management
National YunLin Technology University
123 University Road, Section 3, Douliou, Yunlin
Taiwan, R.O.C.
tangdt@webmail.mis.yuntech.edu.tw

Chihui Chiang
Department of Information Management
National YunLin Technology University
123 University Road, Section 3, Douliou, Yunlin
Taiwan, R.O.C.
cch.admin@msa.hinet.net

Abstract: - The knowledge management can quickly acquired important knowledge way by using mobile equipments via wireless network. Many knowledge management activities occur in working places and in our daily activities. Mobility may be increased self belief and work efficiency by convenience knowledge management in the mobile environments. The recent years study showed that perceived ease of use and perceived usefulness constructs of Technology Acceptance Model have been considered important in determining the individuals' acceptance and use of IT. In this study, we will introduce the convenience and the self-efficacy as new factors that reflect the characteristic of the mobile knowledge management. This paper addresses why users want be used mobile knowledge management and how user's adoption is affected by the convenience and the self-efficacy. The results showed that the research model fully mediated the usage behavior intentions even in the mobile knowledge management through the wireless network environment.

Key-Words: - Mobile knowledge management, Technology acceptance model, Convenience, Self-efficacy

1 Introduction

In the mobility era, the knowledge within a centralized knowledge management server can be easily accessed over the Internet by the client mobile equipments at distinct locations. These mobile equipments have included the high speed wireless bandwidth networks, the notebooks, the personal digital assistants, and the smart phones during the last decade laid the foundation for the mobile management. Many modern cities around the world have planning to build, or have built city-wide wireless networks so that citizens can use the mobile equipments to access/transmission information anywhere within the city, the conference and the other wireless locations. These locations can be provided diverse and abundant mobile network services to attract the mobile workers. These mobile network services include mobile internet access, mobile intranet/extranet access, send/receive emails, remote logon to meet the various needs of users [13][32][36][47]. The mobile knowledge management (mKM) can assist in all the practical aspects of business process and personal things. A number of recent study showed that certain activities can be improved regarding efficiency and effectiveness through the use of mobile technologies [20][29][54]. Thus, the intention of the mobile knowledge

management undoubtedly provides a higher wireless bandwidth and much easier and much effective to users than previously.

However, the growing number of the mobile users and the increased in work things have gradually reduced may used time, thus taking advantage of some trivial time become very important. This situation reveals that business/personal things from fixed office would not be enough for users to survive the highly competitive environment in the further. Therefore, besides conventional mobile operations, mobile thing managements have naturally become a new opportunity for users to use of time.

The behavioral intention is an individual's subjective awareness of performing a specified behavior and is the major determinant of actual usage behavior [4][39][61]. Thus, how take advantage of some trivial time to increased self work efficacy become very important from the convenience mobile equipments. Specially are various mobile network managements have been provided, whether the mobile users can be effectively enhanced remains a question. Understanding user's behavioral intention to use the mobile knowledge management has become a key issue. The objectives of this study are to understand the factors affecting user's behavioral intention to use the mobile knowledge management,

and to analyze the relationships among these factors and use a structure equation modeling approach to validate our assertions.

Additionally, investigation into the behavioral intention to adopt information technology (IT) has always been a significant issue in information management [15][30][33][39][43][44][45]. Among the many theoretical perspectives advanced to address IT adoption and usage, the Technology Acceptance Model (TAM) is widely accepted as a framework for understanding user's IT acceptance processes [15]. In the recent three years, the Technology Acceptance Model [39][58][62] will be used as the framework for our study. The reasons for our choice of this model are the following: (1) TAM is an established and extensively tested theory. (2) Its parsimony that used to explain user behaviour and information technology adoption. (3) The wide range of variables included in the TAM model (social influence and individual's perceived control to behave in a certain way). (4) The fact that it introduces the effect of social influence, variables traditionally related to the convenience and efficacy. In this sense, many of the alternative models which have been developed include variables taken from the Technology Acceptance Model in their structure [7][9][58][62]. Following these approaches, the Technology Acceptance Model seems to be particularly well fitted to be used as the theoretical base for studying the influence of additional variables (e.g. convenience, self-efficacy). Thus, the TAM is superior with respect to other competing models because it supplies more information to explain behaviour [57][62].

In this study, we will be perceived self-efficacy and perceived convenience as the variables to express the mobile knowledge management for the following reasons. First, these two exogenous variables and similar means have been considered as important variables to measure the mobile knowledge management by prior researches [11][12] [19][26][58][62]. Secondly, despite the popularity of the wireless internet, many people resist using it due to the slow response time, caused by poor use of the mobile knowledge management or simply heavy traffic on the works, and lack of easily access, induced by the availability of the mobile knowledge management (PDA, Notebook and Smartphone, etc.). Thus, the mobile knowledge management measured by these two variables is considered important in affecting user's beliefs. Therefore, this study is to propose and empirically validate the extended technology acceptance model. Perceived convenience and perceived self-efficacy are as external variables examine user's perception and behavioral intention to use the mobile knowledge managements. Next section will be to explore related literature and create hypothesis.

2 Literature and hypotheses

We next focus on the Technology Acceptance Model, perceived convenience and perceived self-efficacy to explore relevant literature on the mobile knowledge management. The corresponding research hypotheses are presented according to our review of relevant literature.

2.1 Mobile Knowledge Management

Knowledge management (KM) has drawn attention from both academia and practitioners since 1970s. Knowledge management activities originate from externalization (from multiple sources to the knowledge repository), combination (transformation and analysis), and internalization (knowledge sharing and learning) to socialization (knowledge value addition and innovation); and also encompass many managerial activities such as building up a trusted environment for employees to share their knowledge, the setup and management of knowledge repositories and so on [14]. Although data and information management are important pillars of knowledge management, knowledge management encompasses broader issues – in particular, the creation of processes and behaviors that allow people to transform the knowledge within the organization. Knowledge management (KM) involves identifying, gathering, analyzing, constructing, sharing, and applying knowledge and practices [40][42]. Thus, knowledge management must encompass people, process, technology and culture.

Currently, the mobile equipments (i.e. PDA, Notebook and Smartphone) have been widely used as the carrier for some things and daily works for its high mobility, which the equipment mainly is notebook (93.8%) [23]. The information and wireless technologies have been widely applied to the network environment, the knowledge within a knowledge management server can be easily accessed by the client mobile equipments over the Internet at different locations [32]. Therefore, KM can be used at any place, such as the wireless network environment. Mobile knowledge management (mKM) means a dynamic and flexible administration according to the changing

environment, with rapid reaction in mobile conditions to the external factors due to Information and Communications Technology (ICT) [27][54].

Thus, the mobile equipments can be regarded as a handheld repository of various information including the business things, daily schedule works and user profile [29]. Taking advantage of this important information, the user requirements for knowledge can be determined. Therefore, following above related literatures had type services of the mobile knowledge management, i.e. browse websites information, receive/send e_mail, MSN/bbs, process personal things, process business things, transfer files/documents. These services can be used at wireless environment by the mobile equipments.

2.2 Technology Acceptance Model

The Technology Acceptance Model (TAM) was based on the theory of reasonable action (TRA), but first proposed by Davis in 1989 [4][22]. TAM is one of the most frequently employed models for research on new information technology acceptance [15][16][18]. It is intended to provide a conceptual model featuring a theoretic foundation, to explain and predict the behavioral intention and practical behaviors of user's acceptance and use of IT. Similar to the TRA, TAM suggests that antecedents that directly affect perceived usefulness and perceived ease of use, such as user's behavioral intention, system feature, and environmental variable, can be covered by an external variable. TAM has been extensively applied to user acceptance research of various types of technologies including E_mail, word processor, world wide web (WWW), instant messaging (IM), and e-commerce [15][17][25][49].

The TAM includes perceived usefulness and perceived ease of use as main influencing variables of acceptance or rejection of IT [15][17]. TAM suggests that perceived usefulness and perceived ease of use are beliefs about a new technology that influence an individuals' behavioral intention toward and use of that technology [17]. Many empirical studies have considered TAM in information management domain and perceived ease of use and perceived usefulness constructs have been considered important in determining the individuals' acceptance and use of IT and have generally supported the hypotheses of TAM, i.e., perceived ease of use can strengthen perceived usefulness [1][15][33][37][43][46][53], perceived usefulness and perceived ease of use have significantly positive effects on user attitudes [39][43][46][53]; perceived usefulness has significantly positive effects on behavioral intention [15][43][44][46][53][59].

Attitude affects the behavioral intention to actual usage. TAM included attitude as a mediator between the personal belief constructs and behavioral intention [17]. However, attitude towards using a technology was omitted in their final model because of partial mediation of the impact of beliefs on intention to use by attitude, a weak direct link between perceived usefulness and attitude [17][57]. Consistent with that change, the proposed model does not include the attitude construct.

The studies of mobile commerce based on TAM produced similar findings. For instance, higher perceived ease of use leads to higher perceived usefulness [10][30][39][41][44][59]. Perceived usefulness positively influences behavioral intention [44][59]. Perceived ease of use has no positively influences behavioral intention [62].

According to TAM, user's perception about the mobile knowledge management is defined by beliefs (subjective probability of the consequence if the mobile knowledge management is used), and intentions (willingness to use the mobile knowledge management). The perceived usefulness and ease of use of the mobile knowledge management are defined as the extent to which the user believes that using the mobile knowledge management would increase his/her work performance without too much effort. The preference for represents the extent to which the user is interested in the mobile knowledge management. Intention is the extent to which the user would like to reuse the mobile knowledge management in the future. In this particular study, perceived usefulness and ease of use of the mobile knowledge management, preferences for the mobile knowledge management, and willingness to reuse the mobile knowledge management are respectively used to measure beliefs and intentions. Thus, the following hypotheses can be established:

H1: Perceived ease of use positively influences perceived usefulness on the mobile knowledge management.

H2: Perceived usefulness positively influences behavioral intention on the mobile knowledge management.

H3: Perceived ease of use has no positively influences behavioral intention on the mobile knowledge management.

2.3 Perceived self-efficacy

Computer self-efficacy (CSE) based on Bandura's (1977) self-efficacy theory. Hill et al. (1987) pointed out that computer self-efficacy is an important determinant of an individuals' decision to use computer technology. Many scholars suggested that

the construct of perceived computer self-efficacy which examines users' beliefs regarding their ability to perform specific tasks using an IS provided every services [7][11][19]. Using managers and profession-nals as research samples, Gravill & Compeau (2008) posits that self-efficacy reflects an individuals' belief in his or her capability to perform a work task and thus that perceived self-efficacy (PSE) would promote the sharing of knowledge by the mobile equipments. In mobile computing study, also found self-efficacy to play an important role in determining computer usage, both directly and through outcome expectations [58]. Therefore, Computer Self-Efficacy (CSE) may be defined as a judgment of one's ability to use mKM.

Prior TAM research showed that self-efficacy was a determinant of perceived ease of use at the general computing level [38][55][56], and at the specific application level [3]. Thus in the study of mKM, people who believe they are able to use the mobile equipments with great skill are more likely to expect positive impacts. Computer Self-efficacy was found to be a significant but less substantive influence on usage directly and indirectly through perceived usefulness. Many Scholars studied shown that an individual ability added to the model was the user's experience with the tool, which was significantly and positively related to both Perceived Ease of Use and Perceived Usefulness [12][19]. In addition, there was no significant direct relationship between computer self-efficacy and attitudes toward the Internet [50]. Therefore, the following hypotheses are proposed:

H4: Perceived self-efficacy positively influences perceived usefulness on the mobile knowledge management.

H5: Perceived self-efficacy positively influences perceived ease of use on the mobile knowledge management.

2.4 Perceived convenience

In early marketing usage, convenience denoted the time and effort consumers used in purchasing a product rather than a characteristic or attribute of a product [9]. Convenience, control and efficiency are thought to be the main drivers for customers to bank online [34][51][52]. Base on Eastin (2002) studies four e-commerce activities (i.e., online shopping, banking, investing, and electronic payment system) and finds that prior adoption, perceived convenience (PC) and financial benefits predict adoption decision. The results revealed that perceived convenience is important to note that the process has a direct effect on the ease of use and can use wireless LAN to accomplish their banking transactions in a place that is more convenient for them. In a similar sense, Yoon and Kim (2007) adopted variables of perceived useful, perceived ease of use, behavioral intention, and perceived convenience to study a ubiquitous wireless LAN environment. Analytical results indicate that perceived ease of use has significantly positive effects on perceived convenience. But perceived convenience has no significant impact on behavioral intention to use wireless LAN.

On the basis of above literatures, we define perceived convenience in this study. This is because the wireless mobile technologies are expected to give us convenience through their intelligence and intercommunication in the background of our lives [62]. Therefore, perceived convenience would be considered as a silent determinant of the individuals' acceptance and use of IT on the mobile knowledge management.

H6: Perceived convenience positively influences perceived usefulness on the mobile knowledge management.

H7: Perceived convenience positively influences perceived ease of use on the mobile knowledge management.

3 Research method

In order to empirically test mKM using model and hypotheses previously mentioned, research aimed at mKM users was developed. A qualitative study was carried out at a preliminary research stage. This study consisted of a total of six in-depth interview statements from mobility experts. They are from both professional and academic domains. The interviews focused on the psychological process experienced by users who the mobile knowledge management, placing special attention to the variables that determine mKM intention and behaviour. Given the scope of this paper, the experts were asked about the influence of self-efficacy and convenience, both from a general perspective and domain-specific (e.g. wireless environments, using efficacy). The information obtained from this qualitative research has been particularly useful to define the research universe. The questionnaire design used to collect quantitative data and the analysis, explanation of the final results.

Based on the results obtained from the preliminary research, quantitative research was performed in order to determine the beliefs and the intention of mobile users regarding mKM and their efficacy and convenience in the area of new technology. The method used for data collection was the personal survey. In the following section, there is
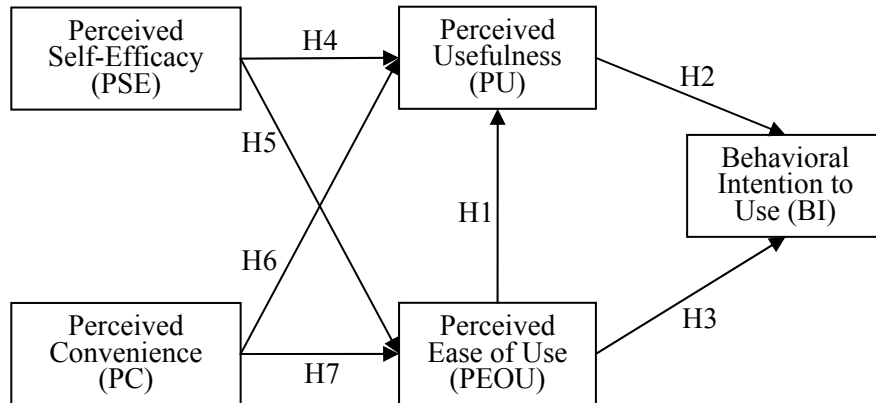
Figure 1. Research model and hypotheses

Table 1. Constructs and questions included in the questionnaire

Construct	Item	Measurement	Reference
Perceived usefulness (PU)	PU1 PU2 PU3	Using mKM can increase the efficiency of my work. Using mKM can increase the efficiency to me for sharing knowledge. I feel that it is useful to using mKM going to sharing knowledge.	Karahanna & Straub (1999), Hung et al. (2003), Wu & Wang (2005), Venkatesh(1999), Davis(2000)
Perceived ease of use (PEOU)	PEOU1 PEOU2 PEOU3	I think that it is ease to using mKM going to sharing knowledge. Using mKM is clear and explicitness. Using mKM is ease to get knowledge what is need.	Karahanna & Straub (1999), Hung et al. (2003), Wu & Wang (2005), Venkatesh(1999), Davis(2000)
Behavior intention (BI)	BI1 BI2 BI3	I can be pleased to management and sharing knowledge by using mobile equipments. I can try to management and sharing knowledge by using mobile equipments. I can be willing to management and sharing knowledge by using mobile equipments.	Karahanna & Straub (1999) Venkatesh(1999), Davis(2000)
Perceived self-efficacy (PSE)	PSE1 PSE2 PSE3	I think that using mKM is very ease and has very efficiency to management knowledge. I think that using mKM is very useful and has very efficiency to management knowledge. I can try to overcome it, if it is difficult to going to knowledge management by using mobile equipments.	Compeau & Higgins (1995), Dishaw & Strong (1999), Gravill & Compeau (2008)
Perceived convenience (PC)	PC1 PC2 PC3	I think that it is very convenience and useful to management knowledge by using mobile equipments. I think that it is very convenience and ease to use to management knowledge by using mobile equipments. I want to going to knowledge management by using mobile equipments if I have in wireless network environment.	Brown (1990) Yoon and Kim (2007) Catherine et al. (2009)

a description of the survey structure which was developed, and a detailed explanation of the research design and field research.

3.1 Research model and Questionnaire design

The research model is based on the extended version of Davis' TAM, and is developed to derive the exogenous variables affecting user acceptance. Both of perceived self-efficacy and perceived convenience, they are an exogenous variable affecting user to use the mobile knowledge management. Furthermore, explained will be how the derived exogenous variables affect the user acceptance process in TAM. Based on the hypothesized model developed through a detailed review of the qualitative research and the related literature on user acceptance of technology and perceived convenience and perceived self-efficacy in Figure 1, a 15-item questionnaire was devised as a measurement scale for the study. Since the questionnaire from the literatures was originally developed in English, a university graduate with special training in English–Chinese translation translated it into Chinese. Another trained translator performed a back-translation to ensure that the original translation was accurate. After the draft was designed, a pretest was performed on four experts familiar with the mobile knowledge management to modify ambiguous expressions. Based on the respondents' feedback, the questionnaire was adjusted to improve its readability and ensure its accuracy and appropriateness. The questionnaire was then adopted in a pilot test involving 45 students of department of information management from one university in Taiwan, who completed the questionnaire. There were 4 items deleted because its corrected item-to-total correlation was below 0.4.

The Cronbach's α value for total reliability is 0.925 and each construct ranged from 0.775 to 0.876 surpassing the standard threshold value of 0.7 [48], thus revealing good reliability. Subjects could clearly understand each question and the content validity could be assured in the formal survey. The formal questionnaire comprised two parts. The first part was intended to understand subject's basic data and their use the wireless technology and the mobile knowledge management. All the measurement scales were nominal. The second part measured the subject's perception of each construct in the model. The questionnaire adopted a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The constructs and questions included in this questionnaire, as shows in Table 1.

In this study, we present a path analytic model of user's perceptions about the mobile knowledge management. The path analysis is applied to explore the empirical strength of the relationship in the proposed model.

3.2 Samples description

In Taiwan, wireless application users have 50.3% and mobile online users have 10.3%, and both user accounts for 39.4% [23]. Above these people in Taiwan have used wireless network and most of them (66.3%) are aged 20-44 years old [23]. Therefore, this study focused on Taiwanese users as research subjects. Most users in this age range are studying in college or graduate school, and are distributed across the whole island. Thus, under limited research resources, this study chose five universities in Taiwan to adopt the undergraduates and graduate students as research samples. A total of 260 questionnaires were distributed. Excluding missing and invalid answers included questions answered wrongly (for instance, where the respondent gave more than one answer to a question that expected only one answer), or left blank, 206 valid responses were collected. The valid response rate was 78.08%.

Table 2 shows the demographic profile of subjects and that of the whole sample obtained. Among the 260 valid responses, 206 subjects were males 115(55.8%) and 91(44.2%) were females. In terms of educational background, College background accounted for 86.9%, graduate school accounted for 8.3%, and all the other subject background were 4.9%. There have 117 subjects were reported to have used wireless network, taking up for 56.8%. Among the 91 subjects who had used mobile knowledge management, taking up 44.2%. Most of them were undergraduate students (48.4%), secondly were manufacturing industry workers (26.4%). In terms of experience of use, 42.9% of the subjects had used mobile knowledge management for over than 5 years, secondly is 3-4 years (37.4%). Approximately 42.7% of the users reported that they have not been used for the wireless technology, because has not wireless network environment. On average, most of them (33.0%) have executed 2-3 hours on mobile knowledge management each week. Secondly is 4-5 hours (25.3%).

4 Data analysis

As a prior examination to the questionnaire, descriptive analysis is performed in order to see the central tendency, dispersion of each question and discover any important survey items.

Table 2. Demographic characteristics of the subjects

Demographic profiles	Scales	Frequency	Percent(%)
All samples Gender (n=206)	Male	115	55.8%
	Female	91	44.2%
Educational level (n=206)	High school	9	4.4%
	College	179	86.8%
	Graduate school	17	8.3%
	PhD doctor	1	0.5%
Experiences in mobile knowledge management (year) (n=91)	Less than 1 year	0	0
	1-2 years	4	4.4%
	2-3 years	14	15.4%
	3-4 years	34	37.4%
	5 years or above	39	42.8%
Average usage wireless technology to execute mobile knowledge management per week (n=91)	Less than 1 hour	3	3.3%
	2-3 hours	30	32.9%
	4-5 hours	23	25.3%
	6-7 hours	17	18.7%
	8 hours above	18	19.8%

Then data analysis proceeds over the two-step approach of the structural equation model. A structural equation model is composed of a measurement model and a structural model. The former shows the relationships between latent factors and measurement variables and the latter presents the causal-effect relations among latent factors [5]. In this study, we apply confirmatory factor analyses to check the validity of the measurement model and conducts factor analysis to verify the construct validity of the measurement instrument. Followed is the structural equation analysis to see the statistical significance of the various relationships among latent factors and between latent factors and measurement variables in the overall model.

Table 3. Types of mobile knowledge management

Types	Frequency	Percent (%)(n=91)	Rank
Browse websites	85	93.4%	1
Receive/Send E_mail	82	90.1%	2
MSN/BBS chat	58	63.7%	3
Process Personal Things	32	35.2%	4
Transfer files/ Documents	19	20.9%	5
Process Business Things	18	19.8%	6

The types of the mobile knowledge management used frequency, as Table 3. Browsing website information has 85(93.4%), Receive/Send E_mail has 82(90.1%), MSN/BBS has 58(63.7%), Process Personal Things has 32(35.2%), Transfer files/Documents has 19(20.9%), process business things has 18(19.8%). In addition, among the reasons for not using the mobile knowledge management because has not wireless network environment.

5 Results and discussion

The research model and the proposed hypotheses were evaluated by the structural equation model (SEM). The analysis tool was used LISREL 8.72 in this study. Parameter estimation was performed by maximum likelihood estimation.

5.1 Measurement model test

The measurement model fit was assessed by a confirmatory factor analysis (CFA). Seven common model-fit measures were used to estimate the model's overall goodness-of-fit: chi-square/degree of freedom ($x2/d.f.$) [8], goodness-of-fit index (GFI), root mean square error of approximation (RMSEA), root mean square residual (RMR), normalized fit index (NFI), non-normalized fit index (NNFI), and the comparative fit index (CFI). According to Table 4, all the model-fit indices exceed their respective common acceptance levels suggested in the previous literature [28]. Except for RMSEA is 0.096 a little greater than 0.08. Therefore, it can be concluded that the measurement model has good fit with the data collected. In addition to the model fit, reliability,

convergent validity, and discriminant validity of the scale were examined.

Table 4. Fit indices for measurement model

Fit indices	Recommended value	Result
x^2/d.f.	<5	3.105
GFI	>0.9	0.968
RMSEA	<0.08	0.096
RMR	<0.08	0.031
NFI	>0.9	0.973
NNFI	>0.9	0.961
CFI	>0.9	0.982

As shown in Tables 5 have completely standardized loadings. The lowest loading obtained is 0.694 linking perceived convenience (PC) to item PC3. Two other loadings estimates fall just below the 0.7 standard. All squared multiple correlations (SMC) of the measured variables were higher than the criterion (0.5), except PSE3 (0.485) and PC3 (0.482). The composite reliability (CR) values of all the constructs were above the recommended level of 0.6, indicating that all measures had good reliability [6][28].

Table 5. Standardized factor loadings, SMC and CR

Construct	Item	Factor Loadings	SMC	CR
PU	PU1	0.751	0.565	
	PU2	0.774	0.600	0.796
	PU3	0.731	0.535	
PEOU	PEOU1	0.748	0.561	
	PEOU2	0.725	0.521	0.791
	PEOU3	0.767	0.576	
BI	BI1	0.743	0.514	
	BI2	0.734	0.502	0.794
	BI3	0.771	0.550	
PSE	PSE1	0.720	0.518	
	PSE2	0.822	0.676	0.791
	PSE3	0.696	0.485	
PC	PC1	0.757	0.573	
	PC2	0.868	0.753	0.819
	PC3	0.694	0.482	

Moreover, the completely standardized factor loadings all reached the level of significance (p<0.01), all the constructs had CR above 0.6, and the average variance extracted (AVE) values for all constructs were higher than the suggested threshold value of 0.50, suggesting the convergent validity of the scale [24], as shown in Table 6. Comparing the square root of the AVE with the correlations among the constructs indicates that each construct is more closely related to its own measures than to those of

other constructs, and discriminant validity was therefore supported [24]. Overall, the evidence of good model fit, reliability, convergent validity, and discriminant validity indicates that the measurement model was appropriate for testing the structural model at a subsequent stage. Inter-variable correlations between the factor scores for each construct are shown in Table 6. The results support the prediction that these constructs are positively related to one another. Specifically, PU, PEOU, BI, PSE, and PC all have significant positive correlations with behavior intentions.

Table 6. Correlation coefficient matrix and AVEs

Construct	PU	PEOU	BI	PSE	PC
PU	**0.566**				
PEOU	0.450	**0.558**			
BI	0.470	0.525	**0.562**		
PSE	0.473	0.479	0.501	**0.560**	
PC	0.359	0.512	0.512	0.542	**0.603**

5.2 Structural model test

The common model-fit indices, recommended values and results of the test of structural model fitness, base on Bentler (1989) and Hair et al. (1998) that their corresponding recommended values to the comparison of all fit indices, as shown in Table 7, indicate a good model fit. Except for RMSEA is 0.088 a little greater than 0.08. Base on the satisfactory fit of the model, the estimated path coefficients of the structural model were then studied to evaluate the hypotheses. The standardized path coefficients, t values and coefficients of determination (R2) of the latent variables, as shows in Figure. 2. Most of the hypotheses were strongly supported, except for hypothesis H1 (β=0.327; t =1.205) and H6 (γ=0.126; t =0.608).

Table 7. Fit indices for structural model

Fit indices	Recommended value	Result
x2/d.f.	<5	3.221
GFI	>0.8	0.879
RMSEA	<0.08	0.088
RMR	<0.08	0.068
NFI	>0.9	0.941
NNFI	>0.9	0.946
CFI	>0.9	0.958

The research results and discussions are shown as follows:
(1)Perceived self-efficacy had significantly positive effect on perceived usefulness (γ=0.531; t=3.428), so H4 was supported. According to the analytical results, the perceived usefulness of the mobile

knowledge management does rise when users have to process some things rapidly and benefit self. Perceived self-efficacy had positively influenced by perceived ease of use (γ=0.479; t= 4.954), so H5 was supported. This result is consistent with the finding of Yi & Hwang (2003). This study indicates that users have affect on using perceived self-efficacy to perceived usefulness and perceived ease of use, it has a motivation, e.g. it has a helpful to users. When users have difficult to be used the mobile knowledge management. These difficult may be operate or use problems. They can be overcome these difficult by learning using skill.

(2) Perceived convenience had significantly positive effect on perceived ease of use (γ=0.712; t=6.315), so H7 was supported. This result is consistent with those of previous studies [34][51][52][62]. This study indicates that users who are more inclined to try new management ways or who have a higher convenience for these things that the mobile knowledge management is easy to use, and operate in the process of using them. Perceived convenience had no significantly positive effect on perceived usefulness (γ=0.126; t=0.608), so H6 has no supported. According to the analytical results, the perceived usefulness of the mobile knowledge management does not rise even when users are feeling to convenience to management things, if the mobile knowledge management can not to bring some benefit.

(3) Perceived ease of use had no significantly positive effect on perceived usefulness (β= 0.23; t= 1.48), so H1 had no supported. This result is consistent with those of previous studies [2][17][35][60]. In prior research examining the extended TAM, PEOU has no significantly affects PU. A plausible reason why PEOU plays a minor role in our model is that our respondents can be considered early adopters of the mobile knowledge management who may be mobile device-security. The study results suggest that self-efficacy might play a more influential role than ease of use in determining the usefulness perception within the mobile knowledge management. Therefore, PEOU is not much influential in users' acceptance of mKM.

(4) Perceived usefulness had significant effect on behavioral intention (β= 0.424; t = 3.145), so H2 was supported. Perceived ease of use had significantly positive effect on behavioral intention (β=0.645; t=4.075), so H3 has no supported. This result is consistent with the findings of previous study [17][30][39][41][57]. It also implies that the wireless network environments are needed to provide the ease of use of link online when users are going to carry out the mobile knowledge management.

Finally, the direct effect, indirect effect, and total effect of each construct on user's behavioral intention to use mobile knowledge management were calculated (Table 8). According to this study, the total effect of these constructs on behavioral intention is ranked as follows: Perceived ease of use > Perceived convenience > Perceived self-efficacy > Perceived usefulness. The study findings that perceived self-efficacy is the most important factor influencing behavior intention for mobile knowledge management, followed by perceived ease of use and perceived usefulness.
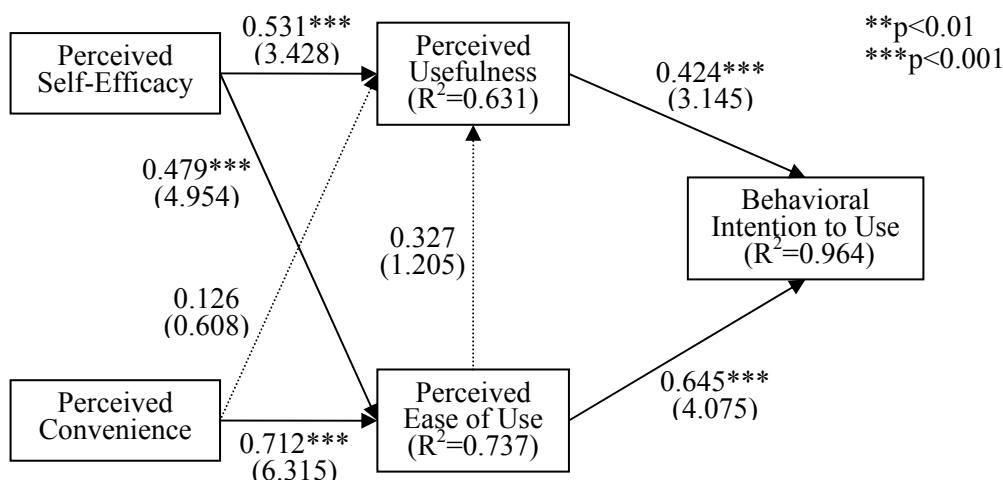

Figure 2. Structural model estimation.

Table 8. The direct, indirect, and total effect of each construct on behavioral intention

Name of Construct	Direct effect	Indirect effect	Total effect
Perceived usefulness	0.424	-	0.424
Perceived ease of use	0.645	0.139	0.784
Perceived self-efficacy	-	0.601	0.601
Perceived convenience	-	0.612	0.612

Perceived Self-Efficacy explained the 63.1% variance of perceived usefulness, as indicated in Figure 2. Perceived self-efficacy and perceived convenience jointly explained the 73.7% variance of perceived ease of use. Perceived usefulness and perceived ease of use jointly explained the 96.4% variance of behavioral intention.

6 Conclusions and suggestions

This study investigated user's behavioral intention to use the mobile knowledge management. The following major conclusions and suggestions were obtained.

First, the wireless network communication has been available for some time. Although users can easily use high-speed data transmission through the mobile equipments, enjoy receive/send E_mail, process personal things, transfer files/documents, process business things and the convenience to management above these knowledge, but the usage rate of current the mobile knowledge management is still little. Hence, more places have installed the wireless network environment. It will increased usage and upgraded the user more efficient use of time to manage and deal with things at day. This conclusion has a proposal for more users to use the wireless network environment. It will be able to provide to the user connects in the right place for convenient knowledge management.

Second, the study found that the ease of use can to enhance self-efficacy and convenience. Users feel that the mobile knowledge management is easy to operate and use, so it can bring efficiency and effectiveness. Because, users think that the ease of use has help on self work or process self things, even business process things. But the mobile knowledge management should operate and use can perceive a higher usefulness and bring more efficiency. Among the constructs affecting user's perceived usefulness, perceived ease of use had a strong effect by perceived self-efficacy.

Finally, to enhance user's behavioral intention to use the mobile knowledge management, perceived self-efficacy and perceived convenience should be the primary focus, followed by perceived ease of use and perceived usefulness. Most of the wireless network environments have been promoted high-speed transmission and can also enhance motivation on users to use the mobile knowledge management.

Although some our hypotheses are not supported here, the results provide meaningful implications for relationships between constructs. However, we found that perceived self-efficacy and perceived convenience are an important determinant of perceived ease of use, but does not have a direct impact on accepting mKM. This study also showed that perceived self-efficacy mediates the relationship between perceived ease of use and perceived usefulness in the wireless network environment for mKM. The convenience concept will also play some important role in increasing usability in the mKM. To increase the perceived convenience, it can increase user's adoption intention by wide in the right places installed wireless network.

Our findings provide meaningful implications for mKM, but the study has some limitations. (1) Due to time constraints, only cross-sectional data were adopted, and the survey was performed at a specific time point for empirical analysis. (2) The mobile knowledge management is still used in access websites information and Receive/Send E_mail. Sampling all the practical users of mKM was not feasible. The starting point of this research is that mKM will become a future trend. Future studies could make an in-depth investigation when users have a higher level of involvement in mKM to acquire more objective arguments. Moreover, follow-up studies could examine the external variables affecting the adoption of mKM, such as knowledge share and knowledge transfer. The sampled user group could be enlarged, and the differences in behavioral intention between different user groups could be compared.

References:
[1] Adams, D. A., Nelson, R. R., and Todd, P. A., Perceived usefulness, ease of use, and usage of information technology: A replication, *MIS Quarterly*, Vol. 16, No. 2, 1992, pp. 227–247.
[2] Agarwal, R., Karahanna, E., Time flies when you're having fun: cognitive absorption and beliefs about information technology usage, *MIS Quarterly*, Vol. 24, 2000, pp. 665–694.
[3] Agarwal, R., Sambamurthy, V., and Stair, R.M., Research report: the evolving relationship between general and specific computer self-

efficacy—an empirical assessment, *Information Systems Research*, Vol. 11, 2000, pp. 418–430.

[4] Ajzen, I., and Fishbein, M. *Understanding attitudes and predicting social behaviour*, Englewood Cliffs, NJ: Prentice-Hall, 1980.

[5] Anderson, J.C. and Gerbing, D.W., Structural equation modeling in Practice: a review and recommended two step approach, *Psychological Bulletin*, 103, 1988, pp. 411-423.

[6] Bagozzi, R.P., and Yi, Y., On the Evaluation of Structural Equation Models, *Academy of Marking Science*, 16, 1988, pp. 76-94.

[7] Bandura, A., Self-efficacy: Toward a unifying theory of behavioral change, *Psychological Review*, Vol. 84, No. 2, 1977, pp. 191–215.

[8] Bentler, P.M., *EQS, Structural Equations, Program Manual, Program Version 3.0*, Los Angeles: BMDP Statistical Software, Inc, 1989.

[9] Brown, L. G., Convenience in services marketing, *Journal of Services Marketing*, Vol. 4, No. 1, 1990, pp. 53-59.

[10] Bruner, G. C. and Kumar, A., Explaining Consumer Acceptance of Handheld Internet Devices, *Journal of Business Research*, Vol. 58, No 5, 2005, pp. 553-558.

[11] Compeau, D.R., Higgins, C.A., Computer self-efficacy: development of a measure and initial test, *MIS Quarterly*, Vol. 19, 1995b, pp. 189–211.

[12] Compeau, D., Higgins, C.A., and Huff, S., Social cognitive theory and individual reactions to computing technology: a longitudinal study, *MIS Quarterly*, Vol. 23, 1999, pp. 145–158.

[13] Crimi, J. C. *Next Generation Network (NGN) Services*, A Telcordia Technologies White Paper, 2006.

[14] Davenport. T., and Prusak. L., *Working Knowledge: How organizations manage what they know*, Harvard Business School Press, Boston, 1998.

[15] Davis, F.D., Perceived usefulness, perceived ease of use, and user acceptance of information technology, *MIS Quarterly*, Vol. 12, No. 3, 1989, pp. 319–340.

[16] Davis, F.D., User acceptance of information technology: system characteristics, user perceptions and behavioral impacts, *Int. J. Man-Machine Studies*, Vol. 38, 1993, pp. 475-487.

[17] Davis, F.D., Bagozzi, R.P., and Warshaw, P.R., User acceptance of computer technology: A comparison of two theoretical models, *Management Science*, Vol. 35, No. 8, 1989, pp. 982–1003.

[18] Davis, F.D., and Venkatesh, V., A critical assessment of potential measurement biases in the technology acceptance model: three experiments, *Int. J. Human-Computer Studies*, Vol. 45, 1996, pp. 19–45.

[19] Dishaw. M.T., and Strong. D.M., Extending the Technology Acceptance Model with Task-Technology Fit Constructs, *Information and Management*, Vol. 36, No. 1, pp. 9–21, 1999.

[20] Dustdar, S., and Gall, H., Architectural concerns in distributed and mobile collaborative systems, *Journal of Systems Architecture*, Vol. 49, pp. 457–473, 2003.

[21] Eastin, M. S., Diffusion of e-commerce: An analysis of the adoption of four e-commerce activities, *Telematics and Informatics*, Vol. 19, No. 3, 2002, pp. 251–267.

[22] Fishbein, M., & Ajzen, I., Belief, *Attitude, Intention, and Behavior: An Introduction to Theory and Research*, Reading, MA: Addison-Wesley, 1975.

[23] FIND (Forseeing Innovative New Digiservices). Program for the development and promotion of the broadband and wireless communications industry, 2007. <http://www.find.org.tw/find/-home.aspx?page=many&id=171>.

[24] Fornell, C., and Larcker, D. F., Evaluating Structural Equation Models with Unobservables and Measurement Error, *Journal of Marketing Research*, 18, 1981, pp.39-50.

[25] Gefen, D., Karahanna, E., and Straub, T, Trust and TAM in online shopping: An integrated model, *MIS Quarterly*, Vol. 27, 2003, pp. 51-90.

[26] Gravill, J., and Compeau, D.R., Self-regulated Learning Strategies and Software Training, *Information and Management*, Vol. 45, No. 5, July 2008, pp. 288-296.

[27] Grimm, M., Tazari, M.R., and Balfanz, D., A Reference Model for Mobile Knowledge Management, *5th International Conference on Knowledge Management*, 29.06. – 01.07.2005, Graz, Austria.

[28] Hair, J. F., Anderson, R. E., Tatham, R. L., and Black, W. C., *Multivariate Data Analysis (5th ed.)*, Upper Saddle River, NJ: Prentice Hall, 1998.

[29] van der Heijden. H., and P. Valiente. The value of mobility for business process performance: Evidence from sweden and the netherlands. *In European Conference on Information Systems (ECIS)*, 2002.

[30] van der Heijden, H., Verhagen, T., and Creemers, M., Understanding online purchase intentions: Contributions from technology and

trust perspectives, *European Journal of Information Systems*, Vol. 12, No. 1, 2003, pp. 41–48.

[31] Hill, T., Smith, N.D., and Mann, M.F., Role of self-efficacy expectations in predicting the decision to use advanced technologies: The case of computers, *Journal of Applied Psychology*, Vol. 72, No 2, 1987, pp. 307–313.

[32] Hou. J.L., and Yang. S.T., A mobile knowledge carrier with personalized knowledge provision, *Computers and Industrial Engineering*, Vol. 51, No. 1, 2006, pp. 44–57.

[33] Igbaria, M., Zinatelli, N., Cragg, P., and Cavaye, A. L. M., Personal computing acceptance factors in small firms: A structural equation model, *MIS Quarterly*, Vol. 21, No. 3, 1997, pp. 279–302.

[34] Jayawardhena, C., and Foley, P. , Changes in the banking sector – the case of internet banking in the UK, *Journal Internet Research: Networking and Policy*, Vol. 10, No. 1, 2000, pp. 19–30.

[35] Jung, Y., Begona P.-M., Sonja W.-P., Consumer adoption of mobile TV: Examining psychological flow and media content, *Computers in Human Behavior*, Vol. 25, Iss. 1, January 2009, pp. 123-129.

[36] Kakemizu, M. and Igarashi, Y. Overview of mobile network services and service control technologies for future enhancements of IMT-2000, *Fujitsu Scientific and Technical Journal*, Vol. 38, No.2, December 2002, pp. 140-148.

[37] Karahanna, E., and Straub, D. W., The psychological origins of perceived usefulness and ease of use. *Information and Management*, Vol. 35, No. 4, 1999, pp. 237-250.

[38] Kim, B. G., Park, S. C. and Lee, K. J., A structural equation modeling of the Internet acceptance in Korea, *Electronic Commerce Research and Applications*, Vol. 6, 2007, pp. 425–432.

[39] Kuo, Y. F., and Yen, S. N., Towards an understanding of the behavioral intention to use 3G mobile value-added services, *Computers in Human Behavior*, Vol. 25, No.1, 2009, pp. 103-110.

[40] Liao. S.-h., Knowledge management technologies and applications – literature review from 1995 to 2002, *Expert Systems with Applications*, Vol. 25, 2003, pp. 155–164.

[41] Liao, C.H., Tsou, C.W., and Huang, M.F., Factors influencing the usage of 3G mobile services in Taiwan, *Online Information Review*, Vol. 31, No. 6, 2007, pp. 759–774.

[42] Liaw. S. S., Chen. G. D., Huang. H. M., Users'

attitudes toward Web-based collaborative learning systems for knowledge management, *Computers & Education*, Vol. 50, No. 3, Apr 2008, pp. 950-961.

[43] Lin, C. C. J., and Lu, H., Towards an understanding of the behavioral intention to use a web site, *International Journal of Information Management*, Vol. 20, No. 3, 2000, pp. 197–208.

[44] Luarn, P., and Lin, H. H., Toward an understanding of the behavioral intention to use mobile banking, *Computers in Human Behavior*, Vol. 21, No. 6, 2005, pp. 873–891.

[45] Mathieson, K., Predicting user intentions: Comparing the technology acceptance model with theory of planned behavior, *Information Systems Research*, Vol. 2, No. 3, 1991, pp. 173–191.

[46] Moon, J. W. and Kim, Y. G., Extending the TAM for a world-wide-web context, *Information and Management*, Vol. 38, No. 4, 2001, pp. 217–230.

[47] Muthaiyah, S. Key Success Factors of 3rd Generation Mobile Network Services for M-Commerce in Malaysia, *American Journal of Applied Sciences*, Vol. 1, No. 4, 2004, pp. 261–265.

[48] Nunnally, J.C., *Psychometric theory (2[d] ed.)*, New York: McGraw Hill, 1978.

[49] Pavlou, P. A., Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model, *International Journal of Electronic Commerce*, Vol. 7, No. 3, 2003, pp. 69-103.

[50] Sam. H. K., Othman. A. E. A., and Nordin. Z. S., Computer Self-Efficacy, Computer Anxiety, and Attitudes toward the Internet: A Study among Undergraduates in Unimas, *Educational Technology & Society*, Vol. 8, No. 4, 2005, pp. 205-219.

[51] Sohail, M. S., and Shanmugham, B., E-banking and customer preference in malaysia: an empirical investigation, *Information Sciences*, Vol. 150, 2003, pp. 207–217.

[52] Tan, M., and Teo, T. S. H., Factors Influencing the Adoption of Internet Banking, *Journal of Association for Information Systems*, Vol. 1, No. 5, 2000, pp. 1–42.

[53] Taylor, S. and Todd, P., Decomposition and Crossover Effects in the Theory of Planned Behavior: a Study of Consumer Adoption Intentions, *International Journal of Research in Marketing*, Vol. 12, 1995, pp.137-155.

[54] Thiele. O., Knapp. H., Schader. M., and Prat. N., Context-Aware Architecture for Mobile

Knowledge Management, *E-Business and Telecommunication Networks*, Vol. 9, 2008, pp. 359-370.

[55] Venkatesh, V., Determinants of perceived ease of use: integrating control, intrinsic motivation, and emotion into the technology acceptance model, *Information Systems Research*, Vol. 11, 2000, pp. 342–365.

[56] Venkatesh, V., Davis, F.D., A model of the antecedents of perceived ease of use: development and test, *Decision Sciences*, Vol. 27, 1996, pp. 451–481.

[57] Venkatesh, V. and Davis, F.D. A Theoretical Extension of the Technology Acceptance Model : Four Longitudinal Field Studies, *Management Science*, Vol. 46, 2000, pp. 186-204.

[58] Wang, Y.-S., and Wang. H.-Y., Developing and Validating an Instrument for Measuring Mobile Computing Self-Efficacy, *CyberPsychology & Behavior*, Vol. 11, No. 4, August 2008, pp. 405-413.

[59] Wu, J. H. and Wang, S. C. What drives mobile commerce? An empirical evaluation of the revised technology acceptance model, *Information and Management*, Vol. 42, No. 5, 2005, pp. 719–729.

[60] Yi, M.Y., Hwang, Y., 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*, Vol. 59, 2003, pp.431–449.

[61] Yi, M. Y., Jackson, J. D., Park, J. S., and Probst, J. C., Understanding information technology acceptance by individual professionals? Toward an integrative view, *Information and Management*, Vol. 43, No. 3, 2006, pp. 350–363.

[62] Yoon C. and Kim S. Convenience and TAM in a ubiquitous computing environment: The case of wireless LAN. *Electronic Commerce Research and Applications*, Vol. 6, Iss. 1, January 2007, pp. 102-112.