Analyzing Moderating Effects of WiBro User Experiences

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Received July 21, 2010; revised August 30, 2010; accepted December 30, 2010; published January 31, 2011

Abstract

The purpose of this study is to explore the determinants of actual demand for wireless broadband (WiBro) services in Korea. To this end, this study identifies conceptual definitions of diverse latent variables and determines the significance of the causal relationship between independent and dependent variables. It then presents the nomadic user concept by testing the moderator effect. This study also proposes a revised Unified Theory of Acceptance and Use of Technology (UTAUT) model, which is an appropriate model for wireless communication services and users' attributes. Prior research has concentrated exclusively on the Technology Acceptance Model (TAM) based on future potential users. Compared to previous studies, the current research model and analysis results are useful in not only academic but also industry contexts.

***Keywords*:** Wireless broadband (WiBro), wireless communication service, UTAUT, user acceptance, moderating effect, nomadic user

This research was supported by the KCC(Korea Communications Commission), Korea, under the CPRC(Communications Policy Research Center) support program supervised by the nipa(National IT Industry Promotion Agency) (NIPA-2010-C1091-1001-0005).

DOI: 10.3837/tiis.2011.01.010

1. Introduction

Wireless broadband (WiBro) is a global standardized wireless broadband communications technology in which Korea is a leader. This technology enhances the mobility of WiMax developed by IEEE 802.16 Group and was approved by IEEE in December 2005 as mobile WiMax standardization [1]. The WiMAX developed by the group follows the 802.16a and 802.16b standards, making it a fixed wireless LAN technology using a frequency bandwidth between 2 and 11 Ghz. It is capable of exchanging data at a maximum speed of 75 Mbps with a coverage of 1 to 2 km. In the United States, WiMAX is expected to increase its market size to an estimated $5.4B, with a yearly growth rate reaching 139%. WiBro, a wireless LAN technology, is a 3.5 generation mobile high-speed internet service led by South Korea.

The Korean WiBro market is characterized by several significant factors. For example, operators provide subsidies for netbook users if they sign up for WiBro service; such a policy directly affects increased demand for subscriptions. 50% of new subscribers are affected by this policy promotion. Since this policy came into force in June 2008, almost 60,000 new users have signed up. Furthermore, effectiveness affects development of emerging technical products or services in the wireless technology market demand. For example, the portable internet router 'Egg' was released in May 2009; since then, 1,200 products have been sold. Egg is a type of wireless router that changes WiBro to a WiFi signal. This device is for wireless network users (e.g., iPods or netbooks). KISDI (2004) predicted that WiBro subscription demand would reach a maximum of 9 million persons by 2011. However, the research analysis in 2008 was only 17 million (3.5%) out of 490 million [2][3]. In addition, recent demand forecast predicted that the number of subscribers would remain at 1.1 million. Such research demonstrates the fundamental factors that cause an accidental error or numerical difference from the early-phase estimated results in new communication services such as WiBro, Internet Protocol Television (IPTV), and Digital Multimedia Broadcasting (DMB) [4]. It is important to predict demand estimates with accuracy in the communications industry. The estimation accuracy issue is a key factor in deciding regulations and policies.
The purpose of this study is to explore the determinants of actual user acceptance of the mobile WiMax (i.e., WiBro) service. Many prior studies on user acceptance have been based on Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB) and Technology Acceptance Model (TAM). These theories have made a great contribution to the field of information technology. Nevertheless, due to the complexities of behavioral research, each scholar used essentially the same concept with different factors or constructs. Therefore, the problems that defined factors are not consistent among existing research [5][6]. The current study redefines variables adopted from of Venkatesh et al.'s Unified Theory of Acceptance and Use of Technology (UTAUT) model and revises the structural equation model appropriately for the research topic [7].

In this research, we analyzed survey results from 354 users of WiBro services. Compared with prior research, this study clearly distinguishes 'actual usage' concept from 'behavior intention'. In addition, this study defined moderators, user characteristics in a nomadic culture and user experience, and verified the moderating effect on causal relationships among other variables. The proposed model in this study would be useful for academic as well as practical framework.

2. Theoretical Background

2.1 User Acceptance and UTAUT

In information technology or the communication research domain, many revised or expanded models are based on classic acceptance models, such as TRA, TPB, TAM, Motivational Model (MM), Combined TAM and TPB (C-TAM-TPB), and the Model of PC Utilization (MPCU). In particular, TAM-expanded studies have focused on specialized and precedent variables such as technical characteristics, user features and economic factors [8][9][10].

The current study adopted the UTAUT model, which verifies the validity of the unified model fit by integrating eight famous existing research models. The UTAUT model is a causal relationship between human behavior intention and actual user behavior (see **Fig. 1**). In the UTAUT model, a research topic focuses on the individual user's perspective. Therefore, it is appropriate for the current research topic in order to explore the influential factors of individual usage on new information technology (e.g., WiBro). The UTAUT model also allows for a time gap between measurements. It generally measures, acceptance or rejection decisions after a long decision period. In addition, data types use cross-sectional or topic-comparison research, making. It is possible to utilize cross-sectional comparison studies with a similar communication service. Venkatesh's UTAUT model includes several independent variables; namely, performance expectancy, effort expectancy, social influence, facilitating conditions, and behavioral intention. Meanwhile, use behavior is a mediated and dependent variable.

Performance expectancy is 'the degree of a personal belief that a user believes a system or service will improve its work performance.' This concept is also known as perceived usefulness (TAM, TAM2, C-TAM-TPB), extrinsic motivation (MM), and job-fit (MPCU). Yoo et al. defined performance expectancy as a personal belief or awareness of using a service that would help accomplish personal work performance [11].

Effort expectancy represents the easiness of using the system. This concept came from three models that include perceived ease of use (TAM, IDT), and complexity (MPCU). This study defines effort expectancy as 'a belief of perceived ease of use, when user uses a communication technology or service.' [12]

Cost expectancy is a new factor referring to 'the degree of a personal economic utility value that a user feels useful a system or service.' Garbarino et al. explained that users show a negative attitude toward buying the product when they feel that perceived cost is lower than the real cost [13][14].

Social Influence is a direct determinant factor of behavior intention. This concept is the same as subjective norm (TAM), social factors (MPCU) and image (IDT). Triandis (2007) claimed that social influence affects user's intention and is mandatory rather than voluntary. In this study this concept is defined as 'the degree of user's belief that reference group around the user should use the same communication service [15].

Venkatesh et al. defined facilitating conditions as 'the degree of belief that it is necessary to have organizational and technical support facilities to support system usage.' This construct is drawn from perceived behavior control (TPB-DTPB), facilitating conditions (MPCU), and compatibility (IDT). Taylor and Todd (1995b) regarded perceived behavioral control as the awareness of exogenous and endogenous constraints. This study defines facilitating conditions as 'users' awareness that when they use certain communication technology or service it is necessary to have base technical or service support.'. The current study also includes 'cost expectancy' as a new independent variable. This refers to a user's willingness to pay or appropriate an economic utility.

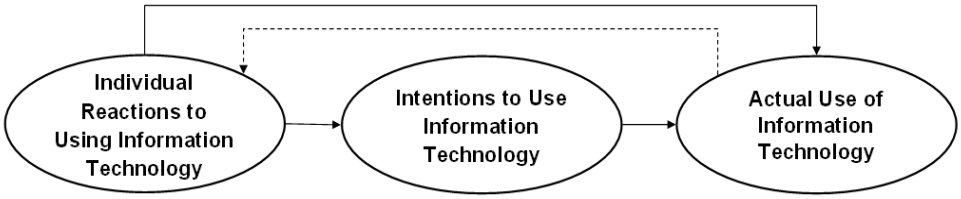

Fig. 1. Basic conceptual model of UTAUT.

2.2 Nomadic User

This study supposes that users who prefer wireless communication service with WiBro have unique attributes. To prove this hypothesis, this study defines attributes of groups by applying the nomad theory. The attributes and experiences of users living in nomadic culture are adopted as moderating variables in order to propose a revised model. Nomad in the dictionary means nomadism, nomadic, nomadic tribe. Today, rapidly changing technology has produced 'digital nomadism'. Yoon et al. presented three dimensions of 'digital nomadism': 'traveling', 'innovation' and 'interaction.' The nomad's culture directly affects the demand for wireless communication service [16]. Users who live in this kind of nomadic culture use Ultimate Mobile Personal Computers (UMPCs), Personal Media Players (PMPs), and PDAs and search the WiBro mobile internet even while traveling, simultaneously performing their work and leisure activities. Therefore, even WiBro, as a leading wireless communication service, has relative significance for user nomads.

The typical nomadic user has several characteristics. First the essential attribute of nomadism is mobility. This means a user in convergence paradigm crosses the border. Jacques Attali predicted that in the near future settlers will become nomads. Yoon et al. defined contemporary society as a flowing nomadic culture, with a lifestyle that prefers mobility for work or and leisure [17].

In addtion, Lee et al. explained that this movement is not only a geographical movement but also referes to movement in cyber space with relevance to the individual context [18]. According to the BCG report, moving digital nomads have at least one device connected to the internet and are familiar with using leading nomadic devices [19]. The relevance of the individual context for the mobile user is not the same as for the fixed user. The mobile user prefers convenience and convergence. The third is 'innovation.'

Nomadic users show acculturation, fashion, innovation and reform tendencies. Susan defined this concept as technical possibilities that allow for instant communication [20]. The fourth characteristic is 'immediacy', which reflects the development of information technology and quick movement of society. The final characteristic is 'interaction.' Nomadic culture entails the deconstruction of borders. Consequently it is hard to distinguish the ego (self) from who is logged into network. Maffesoli found that nomadic users are not isolated; rather, they have decentralization tendencies [21][22].

3. Research Model and Revised UTAUT

As previously discussed, the current study explores the determinants that affect the actual use of the WiBro wireless communication service. This study establishes the research model and hypothesis based on the UTAUT model. The main variables are independent variables (performance expectancy, effort expectancy, cost expectancy, social influence, facilitating

conditions), mediated variables (behavioral intention) and dependent variables (user behavior). In order to prove the moderating effect between the independent and dependent variables, this study adds cost expectancy as an independent variable and defines new moderating variables. The construction of observed variables of each latent variable and the relationship between the variable concepts based on this study's hypothesis are shown in **Fig. 2**.

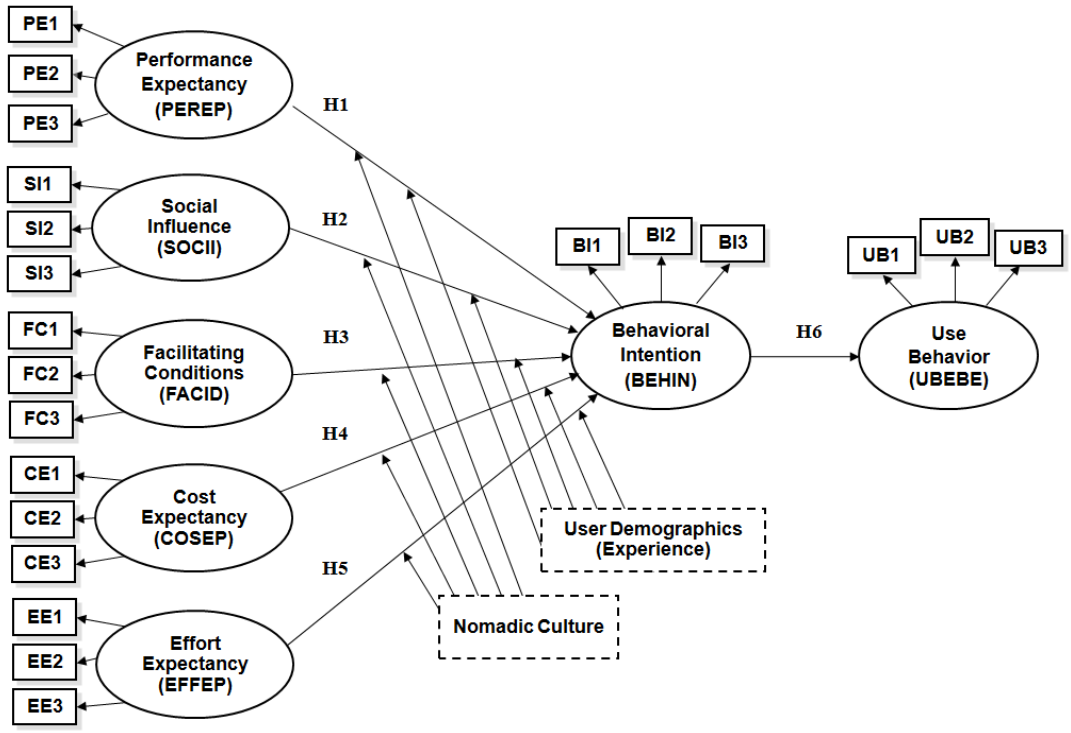

Fig. 2. Research model and hypotheses.

4. Research Methodology

4.1 Sample

To define the demographic statistic of responders, a frequency analysis and descriptive statistics, analysis was performed on a total of 354 samples. The sample chosen for this research is a group of WiBro users. Compared to many other case studies based on latent user groups, there is not only scientific but also practical meaning for determining the conclusive factor of users' actual actions. The analysis result for participants is shown in **Table 1**. The number of male participants is 152 (42.9%), the number of females is 202 (57.1%). By age, 74 of the participants are in their twenties (20.9%), 123 are in their thirties (34.7%), 125 are in their forties (35.5%), and 32 are over 50 (9.0%). Those in their thirties and forties account for more than half of the total. It is assumed from these results that those groups can afford the usage fee. In terms of education, 258 participants were university graduates, (72.9%), 55 were in graduate school (15.5%), and 42 were high school graduates (11.6%). Finally, income status showed a steady distribution (**Table 1**).

Table 1. Demographical descriptive results.

Sections		Frequency	(%)
Gender	Male	152	42.9
	Female	202	57.1
Age	20~30 yr.	74	20.9
	31~40 yr.	123	34.7
	41~50 yr.	125	35.3
	51~60 yr.	32	9.0
Edu	High school	41	11.6
	B.S	258	72.9
	M.S	55	15.5
Job	Student	32	9.0
	Office worker	185	52.3
	Professional	43	12.1
	Self-employed	33	9.3
	Housewife	56	15.8
	Etc.	5	1.4

4.2 Data Collecting

For data analysis, SPSS 15.0 and AMOS 7.0 versions were applied. Prior to the research, a preliminary investigation was performed to improve the responders' understanding of the measured item and to supplement part of the questionnaire. We requested that research companies retain the responder panel of varying ages. To verify the suitability of selected samples and validity of measurements, a frequency analysis, descriptive statistics, EFA, and correlation analysis were performed, following the performance of a confirmatory factor analysis (CFA) and suitableness test of figures. In the last step, structural equation modeling was used to perform a path analysis and moderating effect analysis in order to understand the complex function relationship between latent variables. Based on the result of the analysis, the research model and hypothesis established from this research were confirmed.

The measurement item for the questionnaire included the seven independent variables that affect the actual use of WiBro (3 questions for each, total of 21 questions), mediated variable (3 questions), and dependent variables (3 questions) as well as moderating variables for users' characteristics in the nomadic culture and demographic questions. Except for the moderating variables and demographic question, the questions used a 7-point response system ranging, from never (1 point) to very true (7 points).

5. Data Analysis and Results

5.1 Pre-test and Factor Analysis

The course of data analysis is as follows. In the first step, using CFA, the reliability and validity of observed variables were analyzed. To improve the efficiency of the statistical analysis, 21 observed variables were minimized to seven latent variables. Second, the model fit index was evaluated. Generally, the value for each index was ideally drawn; therefore, the validity of the model was verified. The next step was based on the structural equation model that shows the complex functional relationship between latent variables in which a path analysis was performed to grasp the significance of the causal relationship between factors. Finally, a moderating effect analysis was conducted. The method of research was intended to

establish the causal relationship between concepts through operational definition, charting the latent variables of abstract concepts to several measurement items. As discussed, since the measurement concept of the sample survey is abstract, the verification of reliability and validity of the measurement instrument is also required. It is possible to obtain an accurate result by using CFA rather than EFA through uni-dimensionality, reliability, and validity analyses.

The researchers verified the reliability and validity of the measurement instrument using CFA of structural equation model. Validity defines whether the questionnaire is suitable for measuring the abstract concept. Meanwhile, reliability refers to the accuracy of the measurement instrument and its ability to analyze the contingency of measurements during repetition of the measurement. In general, the reliability measurement condition used the CFA results as follows. The effect of latent variable on observed variable in a round bracket is $\geq .5$ and concept reliability should be $\geq .7$. Average Variance Extracted (AVE) must satisfy $\geq .5$. The validity criteria are as follows. First of all, the value of the reliability must be considered (satisfying $\geq .7$). Second, AVE1 and AVE2 must be larger than the Squared Multiple Correlation (SMC). The result for CFA is shown in **Table 2**. All nonstandard values were found to be around $p<.01$. Here, the observed variable PE2 of the latent variable PEREP, EE1 of EFFEP, CE2 of COSEP, SI2 of SOCII, FC3 of FACID, BI2 of BEHIN, and UB3 of USEBE are the largest nonstandard values of the criterion variables; all were given a value of 1. The creation of criterion variables does not affect concept reliability or the value of AVE.

Moreover, the Critical Ratio (C.R.) values of all observed variables except the latent variable were larger than 2.58 at the $p<.0.01$ significance level. Bagozzi and Yi suggested that $.5 \leq$ standardized $\leq .95$ is based on appropriate evaluation criteria. As a result of the analysis, all standardized values were satisfactory [23]; therefore, all observed variables hold a strong convergent validity. Finally, an evaluation of the concept reliability latent variable and AVE, and SMC was done. For all factors, reliability values are $\geq .7$ and AVE is $\geq .5$, thereby confirming concept reliability. Moreover, the SMC value is smaller than AVE for each factor, which confirms validity.

5.2 Model Fit

The first value to study from the validity analysis of the structural equation model is $\chi 2$. However, during the confirmation, type I or type II error can occur depending on the sample size. Thus, other fit indices not affected by the sample size should be considered, such as absolute fix index, incremental fit index, and parsimony fit index. The indices commonly presented by scholars are $\chi 2$, RMSEA, CFI, RFI, AGFI, and PNFI. For the evaluation of the model fit of the research, the typically recommended appropriate model index values are given in **Table 3**. From $\chi 2/df=3.0$, the value is relatively ideal and the significance of the *p* value was verified. Next, RMSEA determines close fit (<.05), reasonable fit (<.08), mediocre fit (<.10), and unacceptable fit (>.10). The results (.076<.08) can be evaluated as a reasonable fit. Empirically, ≥.9 is the recommended index and for GFI, AGFI (absolute fit), NFI, IFI, RFI, TLI, and CFI (incremental fit), which also proved to be ideal. Finally, in regard to parsimony fit, PNFI (.726) and PGFI (.633)≥.5 and .6 also showed a desirable result. Thus, the variables used in the research ensure construct validity from the model fit evaluation.

5.3 Path Analysis and Hypothesis Verification

The next step in verifying the suitability of the research model is a path analysis to evaluate the

relative significance among variables. To verify the significance of estimated values used in the research model, a *t*-test analysis was performed using AMOS 7.0. Generally, if at the p<.05 (5%) significance level the C.R. is larger than 1.96 and at the p<.01 (1%) significance level the C.R. is larger than 2.58 (p<.01), the regression weights hold significance. In other words, the factor determination coefficient of the latent variable based on the observed variable is statistically significant.

Table 2. CFA reliability and validity of latent variables.

Latent Var.	Observed Var.	Estimate (λ)	S.E.	C.R.	Standard (λ)	Standard (λ^2)	1-λ^2	Construct Reliability & AVE***	SMC
PEREP	PE1	0.899	0.034	26.550	0.896	0.803	0.197	Reliability (0.932), AVE (0.820)	SMC_{PE} 0.403(0.635)
	$PE2_2$	1.000	-	-	0.921	0.848	0.152		SMC_{PC} 0.263(0.513)
	PE3	0.944	0.035	26.833	0.900	0.810	0.190		SMC_{PS} 0.419(0.647)
				Total (Total)^2	2.717 7.382	2.461	0.539		SMC_{PF} 0.207(0.455)
EFFEP	EE1	1.000	-	-	0.900	0.810	0.190	Reliability (0.904), AVE (0.759)	SMC_{PU} 0.341(0.584)
	EE2	0.773	0.036	21.196	0.842	0.709	0.291		SMC_{EC} 0.104(0.322)
	EE3	0.875	0.039	22.499	0.871	0.759	0.241		SMC_{ES} 0.174(0.417)
				Total (Total)^2	2.613 6.828	2.278	0.722		SMC_{EF} 0.501(0.708)
COSEP	CE1	0.992	0.049	20.437	0.820	0.672	0.328	Reliability (0.900), AVE (0.750)	SMC_{EB} 0.307(0.554)
	CE2	1.000	-	-	0.913	0.834	0.166		SMC_{EU} 0.319(0.565)
	CE3	0.971	0.044	22.301	0.862	0.743	0.257		SMC_{CS} 0.513(0.716)
				Total (Total)^2	2.595 6.734	2.249	0.751		SMC_{CF} 0.015(0.123)
SOCII	SI1	0.892	0.042	21.458	0.796	0.634	0.366	Reliability (0.912), AVE (0.776)	SMC_{CB} 0.286(0.535)
	SI2	1.000	-	-	0.962	0.925	0.166		SMC_{CU} 0.328(0.573)
	SI3	0.922	0.034	26.974	0.877	0.769	0.257		SMC_{FB} 0.235(0.485)
				Total (Total)^2	2.635 6.943	2.328	0.672		SMC_{FU} 0.158(0.397)
FACID	FC2	0.603	0.066	9.188	0.608	0.370	0.630	Reliability (0.689), AVE (0.531)	SMC_{BU} 0.557(0.746)
	FC3	1.000	-	-	0.832	0.692	0.308		
				Total (Total)^2	1.440 2.074	1.062	0.938		
BEHIN	BI1	0.941	0.030	31.558	0.923	0.852	0.148	Reliability (0.932), AVE (0.820)	
	BI2	1.000	-	-	0.949	0.901	0.099		
	BI3	0.809	0.033	24.475	0.841	0.707	0.293		
				Total (Total)^2	2.713 7.360	2.460	0.540		
USEBE	UB1	0.855	0.056	15.340	0.717	0.514	0.486	Reliability (0.846), AVE (0.848)	
	UB2	0.954	0.054	17.543	0.789	0.623	0.377		
	UB3	1.000	-	-	0.899	0.808	0.192		
				Total (Total)^2	2.405 5.784	1.945	1.055		

The verified result of the research hypothesis based on the analysis of path weights is shown in **Table 4** and **Fig. 3**. Hypotheses H1 and H3 were chosen for being larger than 1.96 at p<.05 (5%); H2 and H6 satisfy p<.001. H5 (Behavioral intention ← Effort expectancy) was rejected whereas the significant relationship between the dependent variable (use behavior)

and independent variable (cost expectancy) (H4!) as well as effort expectancy (H5!) were verified. As shown in **Table 4**, since the C.R. value that represents the effect on different variables by two hypothesis is H4!(2.973), H5!(2.634) > 2.58, at the p<.01 significance level, the significant causal relationship between values was completed. H5 approached 1.96 (the standard C.R. value is 1.726). Thus, effort expectancy is a new variable of the research, and the cost expectancy introduced showed a direct causal relation not only with behavioral intention and user behavior, but also with the dependent variable.

As a result, it can be assumed that WiBro users consider social effects and, most importantly, network effect (i.e., installed base). In other words, social effects have a strong influence on usage intention. Moreover, cost expectancy, which can verify economic utility or basic service support for the convenience of use, can also provide a positive effect. Notably for communication service users such as WiBro users, if cost expectancy or effort expectancy (e.g., ease of use) is satisfied, actual use of service can be directly connected.

Table 3. Model fit indices.

Fit Measures Index	Recommended value	Result
$\Delta\chi^2$ / Δ d.f.	≤ 3.00	3.04
RMSEA	≤ 0.08	.076 (reasonable)
CFI	≥ 0.90	.948
RFI	≥ 0.90	.905
AGFI	> 0.80	.849
PGFI	≥ 0.50, .60	.633
GFI	≥ 0.90	.893
NFI	≥ 0.90	.925
PNFI	≥ 0.50, .60	.726
TLI (NNFI)	≥ 0.90	.934
IFI	≥ 0.90	.949

Table 4. Confirmatory hypotheses testing.

Path[a]		Estimate (Standard)	S.E.	C.R.	P	Result
H1	Behavioral intention ← Performance expectancy	.182 (.142)	0.088	2.075	0.038	support
H2	Behavioral intention ← Social influence	.257 (.245)	0.080	3.199	***	support
H3	Behavioral intention ← Facilitating conditions	.280 (.205)	0.118	2.375	0.018	support
H4	Behavioral intention ← Cost expectancy	.238 (.214)	0.078	3.060	0.002	support
H4!	Use behavior ← Cost expectancy	.214 (.210)	0.072	2.973	0.003	support
H5	Behavioral intention ← Effort expectancy	.186 (.148)	0.108	1.726	0.084	not support
H5!	Use behavior ← Effort expectancy	.253 (.218)	0.096	2.634	0.008	support
H6	Use behavior ← Behavioral intention	.464 (.504)	0.058	7.932	***	support

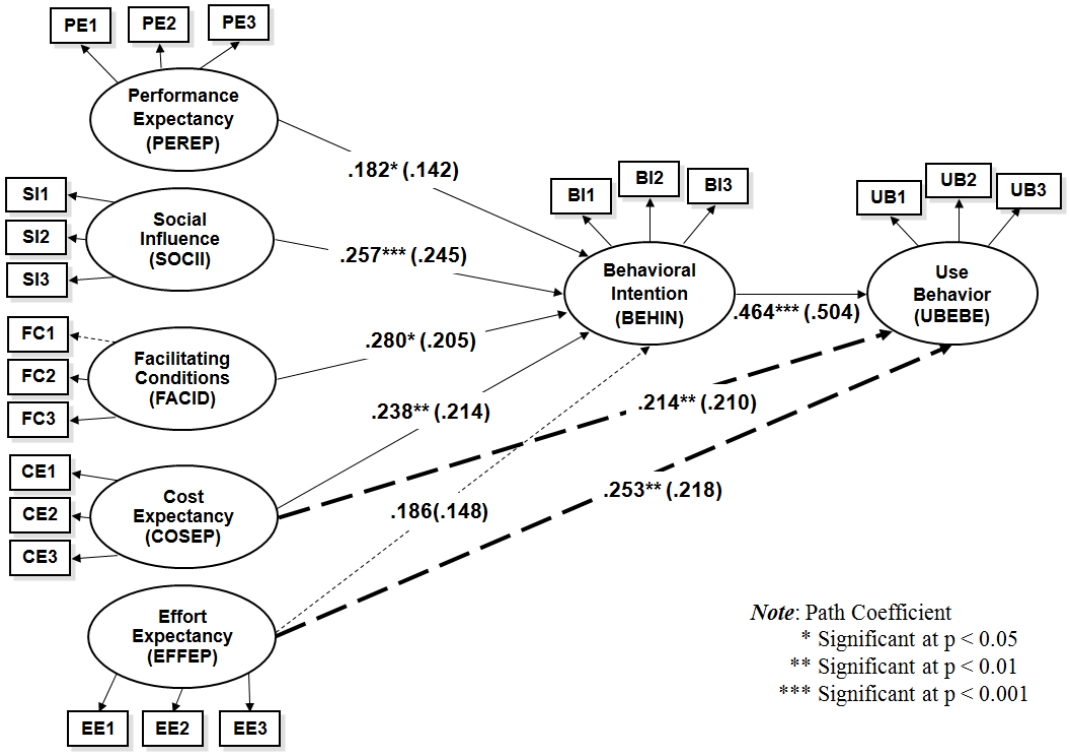

Fig. 3. Path analysis results: Revised model.

5.4 Moderating Analysis

The moderator effect(or 'interaction effect') is the effect analysis of the relationship between the antecedent and consequence. In the structural equation model, only path coefficients do not affect the moderator effect. All moderator effects from the parameter can be verified. The moderator effect is not included as a variable from the structural equation model. It is analyzed as the same model after grouping the data set. Dividing the sample into two groups and applying it to the same model, the sample's number of covariance matrix estimator, parameter, and degree of freedom are increased two times. Gap analysis (*z*-test) and $\chi 2_d$ are used to prove the moderator effect. This study uses $\chi 2d$. In order to verify the moderator effect, it needs to have a dual model, such as a non-constraint model and a constraint model. The difference between those two models is verified in **Fig. 4** and **Table 5**.

Table 5. Moderating effect testing.

Modeling		χ^2	d.f.	RESEA	CFI	RFI	AGFI	GFI	NFI	$\Delta\chi^2$ / Δd.f.
Original model		452.8	149	.076	.948	.905	.849	.893	.925	N/A
Moderating variable NC	A	817.7	298	.072	.941	.839	.748	.821	.874	2.603
	B									
Moderating variable EX	A	817.7	298	.070	.917	.842	.758	.828	.876	2.458
	B									
Note: moderating variable NC (users' characteristics in the nomadic culture); moderating variable EX (user experience); A(high), B(low)										

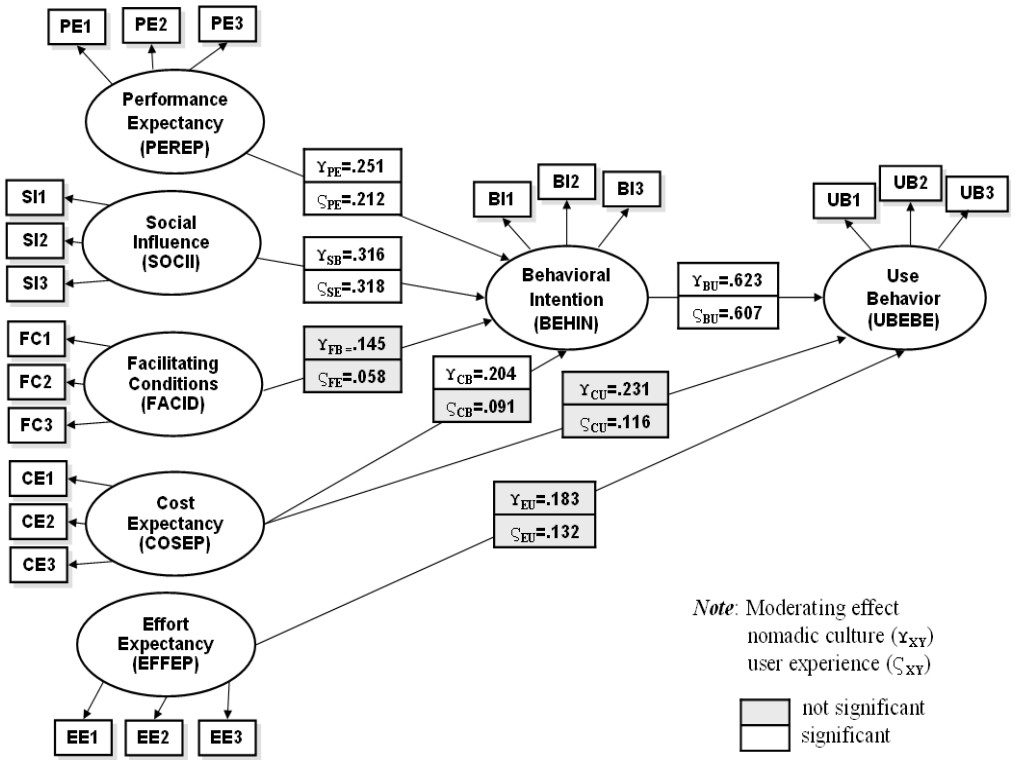

Fig. 4. Moderating effect results.

5.5 Findings

The most important implications of this study's findings are divided into three parts.

Finding 1: This study reexamined the adequacy of the UTAUT model. The variables introduced (PE, EE, SI, FC) excluding EE, were shown to have a credible affect on the purpose of action and the truly used variables. The path analysis from the effort expectancy and behavior intention was insufficient. The effort expectancy (similar to ease of use) affects users' actual usage.

Finding 2: WiBro users, who comprise the study's experimental sample, can be described as 'early adapters'. The experiment found that, effort expectancy does not affect the intention of actions; however, it clearly affects real usage. From these results, we can define real WiBro users as 'early adapters'. Whether the WiBro service is simple to use or not, does not affect people's intention to use it. They use the service regardless of the simplicity of service usage. In the future, expected efforts can affect the intention of service usage when WiBro service becomes more popularized among the public. In addition, the fact that WiBro service is simple to use can help real users to adopt the service.

Finding 3: The new variable of cost expectancy was found to have a direct relationship with actual user behavior since customers value the economic incentive and utility. If we predict both the indirect effect of behavioral intention and the direct effect of actual user behavior, then the new variable can be the most effective independent variable for actual user behavior. This result reveals that WiBro users are directly affected by economic variables, such as the WiBro fee, equipment cost, and the revenue produced by WiBro usage, although they also have secondary variables, to consider such as result expectation, social impact, and the conditions of usage promotion. This finding stems from the addition of the new 'cost

expectancy variable.'

6. Conclusion

This study defined moderator effect variables as the users' experience and nomadic cultural propensity. Characteristics of nomadic user mobility and tendency to change are rated. As a result, nomadic variables were determined to be significant to the moderator effect. User's experience did not emerge as significant to the moderator effect. Since the analysis result shows that the probability of significant probability exceeds 0.05, it can be considered a good model. The test statistics of differences between two path coefficients is 2.04, which is 5% different from the significance level. The tendency of nomadic variables' moderator effect exists in EB. This study explored the determinants of actual demand by considering the WiBro users. This study presents a revised UTAUT model to prove the correlation among independent, mediated, and dependent variables. Venkatech et al.'s performance includes expectancy, effort expectancy, social influence, and facilitating conditions (defined as constructed variables of this research model as independent, mediated and dependent variables).

In summary, this research methodology set up the UTAUT model as a base model and established a hypothesis and research model through structural equation modeling. First, this study added a new variable to operationally define the economic effect, which is an influencing factor of demand for communication service (e.g., cost expectancy). Second, this study verified the moderator effect by redefining the moderator variable as applied user's tendency from wireless communication service to nomadic theory. In regard to the range of this research, our model is based on the perspective of user demand theory in the IT field and communication service. It defined the main variables operationally and developed the measurement instruments of latent variables through a literature review. It further surveyed an actual group of users with regard to 21 topics. The procedure of analysis was verified using CFA measurement reliability, validity and model fit testing. The results supported the research hypothesis through structural equation model, path analysis, and moderating effect.

As a result of this study, the variables examined – namely, performance, social influence, facilitating conditions, cost expectancy – have been verified to relate directly to behavior intention. The most powerful relationship shown in social influence suggests the importance of network effects in the communication industry.

Most previous studies considered only future potential customers and could not distinguish behavior intention and usage variable clearly. To overcome such limitations, this study sampled actual WiBro service users. The results of this study can be applied to DMB and IPTV, which are similar to the WiBro service. The results are also useful as base data for implementing marketing strategies or policies. Nevertheless, this study handled only the moderator effect items regarding users' attributes in wireless communication service. Future research should focus on all moderator effect items to identify the diverse factors regarding users' demand.

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