Acceptance-Diffusion Strategies for Tablet-PCs: Focused on Acceptance Factors of Non-Users and Satisfaction Factors of Users

You-Jin Kim and Jin-Bo Sim

Among emerging devices propelling the growth of mobile devices, smartphones and tablet-PCs are among the most recognizable. In this study, a research model is designed for exploring acceptance-diffusion strategies for tablet-PCs from the viewpoint of consumer perception, which is verified through a survey. The results of this study show that tablet-PCs have great potential to be versatile, multifunctional devices, even though they are currently considered mostly as entertainment-oriented rather than fulfilling the essential needs of everyday life. An analysis of the acceptance model for tablet-PCs revealed that playability, cost level, functionality, and complexity significantly affect user acceptance. An analysis of the diffusion model, on the other hand, showed that playability and user interface have a significant influence on satisfaction, trust, and positive behavioral intention. We also found that cost level is not a major hindrance in the market diffusion of tablet-PCs. The results of this study can be used to establish effective acceptance and diffusion strategies for tablet-PCs and other emerging devices.

Keywords: Tablet-PCs, acceptance, diffusion, emerging devices, playability.

I. Introduction

The mobile industry, though vast as its market size already is, still has much untapped growth potential remaining. Estimated at US$ 1.0952 trillion at the end of 2009, the global mobile market value is expected to grow to US$ 1.3398 trillion by 2015 [1]. The pace of growth is particularly brisk in the mobile device sector. Currently representing 14.3% of the overall mobile industry, the device sector is predicted to account for as much as 17.9% by 2015. The shares accounted for by mobile services and systems, on the other hand, have been on a downtrend, for some time.

Growth in the device field is driven by various emerging devices. In this study, we will refer to all new devices, recently introduced to the market and aligned with the latest communications environment and state of technological evolution, known as "emerging devices." Emerging devices tapping the latest technological breakthroughs in wireless networking and leading market trends include general communications devices, such as the smartphones, tablet-PCs, PDAs, and net-books, and function-specific devices, such as e-book readers, digital photo frames, digital cameras, MP3 players, and the PMPs.

Partnership and convergence with non-telecommunications industries are essential preconditions for the introduction of new emerging devices. The development of emerging devices is, for this reason, considered an engine helping to accelerate the pace of expansion of the telecom and mobile fields as well as the process of foraying into the mobile field by other industries. In recent years, both device makers and mobile

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service providers are rolling out various emerging devices and are actively developing new service and business models based on these devices.

Of the many innovative emerging devices currently available, net-books, PDAs, e-book readers, and digital photo frames are performing rather poorly in the market, compared to others. This also used to be the case for tablet-PCs during the initial stage following their launch. However, with the use of smartphone OS and updated designs, tablet-PCs are receiving renewed attention and are now regarded as leading devices, whose potential is second only to the smartphone.

Tablet-PCs are mobile computing devices enabled with touchscreens or pen inputs. They further provide the functions of various other devices such as MP3 players, PMPs, net-books, and smartphones.

The outlook for the tablet-PC market varies somewhat depending on the forecaster. Gartner (2010) predicts that tablet-PCs will hit 154 million units in cumulative sales, globally, by the year 2013 [2], while the corresponding figure estimated by Strategy Analytics (2010) is only 21.7 million units [3]. Meanwhile, the growth potential of tablet-PCs is rather tremendous according to quite a few experts who believe that they will completely replace, at some point in the future, all mid-size mobile devices, such as notebooks, net-books, e-book readers, and PDAs. On the other hand, there are other experts who see tablet-PCs as a niche product whose market position is midway between net-books and smartphones. These experts believe that their take-up is bound to be limited for this reason.

Given these mutually contradictory forecasts, in this study, we propose to discuss strategies for the acceptance-diffusion of tablet-PCs from a consumer perspective. The goal of this study is to identify factors influencing consumer acceptance and positive behavioral intention toward tablet-PCs. We begin by reviewing the existing literature on the acceptance and diffusion of new IT devices and develop an acceptance model and a diffusion model for tablet-PCs, based on this review. The acceptance and diffusion models are, then, tested against empirical data. The larger goal of this study is to propose strategic implications for the acceptance-diffusion of tablet-PCs, based on the results of the empirical analysis.

Thus far there have been extensive studies on the acceptance and diffusion of new IT products, although the majority of ex post studies analyzed the phenomena after the products had already been released into the market. On the other hand, there is considerable interest in the product acceptance and market diffusion of tablet-PCs, which are now at the market introduction stage. Furthermore, as interest in smart-Pads is rapidly increasing, it is expected that tablet-PCs will lead the smart device market. Therefore, a study on the acceptance and diffusion of tablet-PCs will provide timely implications regarding the IT marketing strategy for emerging devices due for release in the near future.

II. Theoretical Background and Research Model

1. Acceptance of new IT Products

Many factors can influence the acceptance of new IT products. The technology characteristics of a product, social influences, and the characteristics of individual consumers are some of them. How continuous [4] and disruptive [5], [6] the technology characteristics of an IT product are, how big the product's potential is, and how sizeable its network effects are constitute key factors greatly influencing the acceptance of a new IT product. Equally considerable is the influence of social factors such as the socio-cultural characteristics of a product, reference group, and social interaction. The characteristics of individual consumers also tremendously influence their acceptance of an IT product. These characteristics range from demographic characteristics to lifestyle characteristics and include innovative characteristics [7] and the level of consumer knowledge.

Tools for understanding the many and varied factors influencing consumer acceptance behavior, from the perspective of social psychology, include the theory of reasoned action (TRA), the theory of planned behavior (TPB), and other explanatory models deriving from the latter, such as the decomposed TPB. The technology acceptance model (TAM) and task-technology fit (TTF) model, widely used for studies on the acceptance of information technology and new IT products, are also derived from existing behavioral theories.

The TAM was developed by drawing on various theories including expectancy, self-efficacy, behavioral decision-making, and innovation diffusion theories. The basic argument in the TAM framework is that consumer attitude toward a new technology or an innovative product is influenced by innovation-related characteristics of the technology or product, as perceived by individual consumers; namely, the "perceived usefulness," the "perceived ease of use," and the attitude so formed influence consumers' intentions to use the technology or product. Several studies have shown that the TAM has an acceptable predictive validity when measuring the usage of new information and communication technologies [8]-[12].

2. Diffusion of New IT Products

The diffusion of a new product means how a new product comes to be accepted by a social system, including individuals, groups, or other units of adoption through the process of concrete communication, usually with a time lag, and how the

number of adopters increases over time [13]. In the field of marketing, research on new product diffusion has traditionally focused on the adoption perspective [14].

Among noteworthy theories explaining the process of diffusion of a new product is the product lifecycle theory (PLC) by Vernon (1966) [15], a pioneering theory in this area that was followed by the analytical model by Bass (1969) [16], popularly known as the 'Bass model,' and mathematical models, such as the Gompertz model, Fourt and Woodlock model, and the logistic growth model. As for models explaining the process of diffusion from an adopter's perspective, the diffusion of innovation theory (DIT) by Rogers is the most representative [17]. The use-diffusion (UD) model by Shih and Venkatesh (2004) is also well known [14].

According to the Bass model, a classical theory for explaining the diffusion of innovative products, the starting point in the process of diffusion is when an innovative product reaches a critical mass in terms of market size. While innovative consumers lead the acceptance of a new product until the market reaches the critical mass, once the critical mass is attained, imitative consumers become the main actors in the process of diffusion, under the influence of innovative consumers. Accordingly, for the successful marketing of an innovative product, it is important to reach the critical mass. When consumers purchase a new IT product that they feel satisfied with and trust, they are inclined to continue using it, and this intention of continuous use serves as the trigger of mass diffusion.

3. Research Models

A. Acceptance Model of Tablet-PCs

Davis (1989) defined "perceived usefulness (PU)" as "the extent to which the user of a new technology believes that this technology can help improve his performance" [18]. By re-adapting this definition for emerging devices with which this study is concerned, we formulated the following operational definition of PU: the extent to which a consumer believes that a new IT product can improve their quality of life and performance. In this study, using the PU from the TAM framework, we tried to look for external variables that can stimulate the acceptance intention of consumers. External variables under the TAM were identified at two different levels: "technology characteristics" and "individual characteristics," which are two categories from the TTF framework.

Meanwhile, "attitude" toward a technology, considered in early TAM studies as a mediator linking PU and behavioral intention, was repeatedly found to be a mediator of negligible importance in later studies [8], [19]. Therefore, in this study, we designed research models in which PU influences consumer acceptance toward tablet-PCs directly, without being mediated by the variable, "attitude."

This study also excludes perceived ease of use (PEU), another important mediator within the TAM framework, deemed irrelevant for the acceptance of emerging devices. Sim (2011), for example, found little to no evidence that PEU has an influence on either PU or acceptance intention [20]. What this means is that for today's consumers, many of whom are familiar with handling IT devices with many complex functions, the ease of use of a device is no longer as important a factor in their decision to adopt it.

In this study, we selected four technology characteristics, deemed likely to have an influence on PU, based on the review of the existing literature, namely, playability, functionality, cost level, and complexity.

Playability, here, means attributes that make the use of a tablet-PC interesting, fun, and exciting for its users. A considerable number of studies have reported that playability has an important influence on consumers' acceptance of an IT device and consumers' use behavior toward it [21].

Cost level is a variable related to the cost of accepting a new product. This variable was selected based on the findings of a good number of studies that the more appropriate and rational the price level, the greater the level of PU and the stronger the acceptance intention [22].

Functionality is a variable capturing the technical quality of a product. Functionality was chosen based on the findings of several studies that PU, PEU, and acceptance intention are affected by functionality [23].

Complexity means the extent to which users perceive a product as difficult to understand and its functions as complicated. As a general rule, the more complicated a product is, the more difficult the perception of its usability [22]. Generally, complexity has been considered as a factor that has an indirect impact on PU by the lowering of PEU. However, we excluded PEU from the acceptance model in this study, as we judged PEU to be a parameter that would not have a significant impact on new IT products. Nonetheless, we judged that complexity would have an impact on PU, without going through PEU, and that this is an important factor in IT devices.

Meanwhile, personal dimension factors influencing the acceptance of a new product are highly varied. In this study, of the many personal-dimension factors, we chose to focus on self-efficacy and individual innovativeness.

Self-efficacy is defined as an individual's belief about his/her ability to perform certain tasks successfully [24]. In the case of a new IT product, perceived self-efficacy corresponds to the extent to which an individual consumer believes that she or he can successfully use the product. Several researchers suggest self-efficacy is a critical determinant of decisions involving

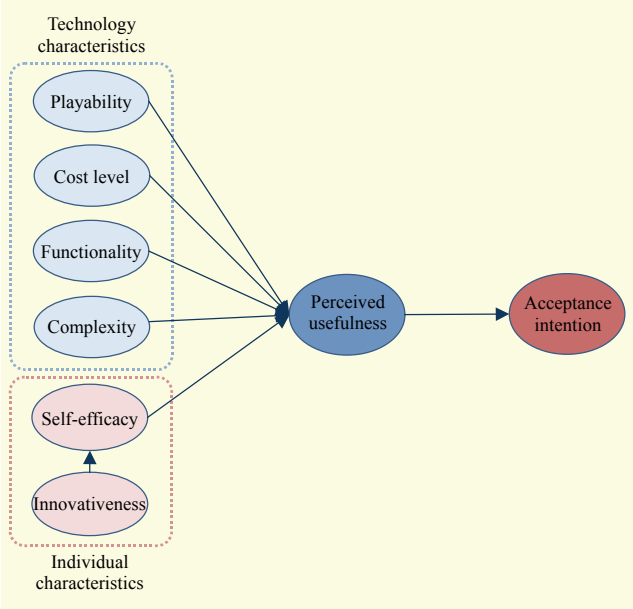

Fig. 1. Acceptance model of tablet-PCs.

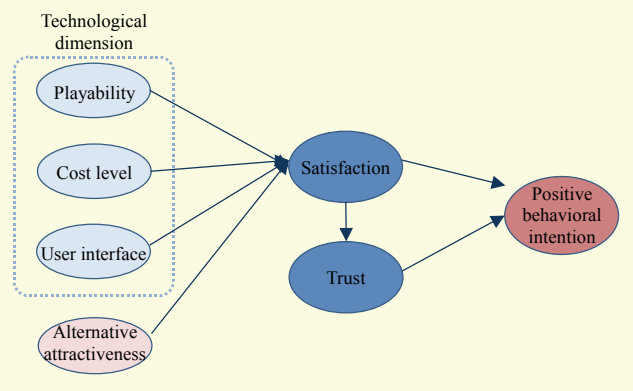

Fig. 2. Diffusion model of tablet-PCs.

technological innovations [25], [26]. When a new technological innovation is introduced, potential adopters consider both the perceived benefits over existing methods and the perceived risks or costs involved in changing [27].

Innovativeness has been referred to as the degree to which one member of a social system adopts innovation before other members [28], but also as the degree to which an individual consumer adopts innovation before others in the same social system [22 (Rogers, 1983)]. Research on the innovativeness of consumers has thus far been conducted from these two main perspectives. According to the first perspective, innovativeness is a trait of innate personality [29]. However, Rogers' view suggests that innovativeness is either domain-specific or product-specific [30]. Although it is rather difficult to decide which of these two views is the correct one, consumers' innovativeness remains a very important factor in terms of influence on whether or not they will adopt a new product and how soon they will do so [7]. Individuals with a high degree of innovativeness toward information technology tend to have a stronger intention to use a new innovative technology or system [31]. Based on the review of the above-mentioned works, we developed an acceptance model for tablet-PCs as shown in Fig. 1.

B. Diffusion Model of Tablet-PCs

In this study, we focus on factors within the UD framework that have an influence on the diffusion of new products. Our basic assumption was that customer satisfaction with a new IT product is an important determinant of trust in the product and positive behavior intention toward it.

Satisfaction is a factor that has a significant impact on the user's intention to continue using a product. Thus, we judge that innovators or early adopters who are satisfied with a new IT product will continue to use the product and that it is highly likely that the early majority or late majority of people who see that innovators or early adopters are using that product will also purchase the product. The model was designed according to the idea that such causal relations are based on diffusion through satisfaction. Therefore, we tried to identify external variables that influence satisfaction with tablet-PCs.

By structuralizing key categories such as determinants, patterns, and outcomes, the UD theory attempts to overcome the limitations of the adoption-diffusion model. Factors influencing consumer use behavior within the UD framework fall into four large categories: household social context, and technological, personal, and external dimensions. Under the influence of these factors, consumer use behavior varies. Based on their behavioral patterns, consumers can be classified into four user segments; intense use, nonspecialized use, specialized use, and limited use, according to the variety and rate of use, which are two constructs under the UD framework. Meanwhile, the UD outcomes take the form of perceived impact of technology, satisfaction with technology, and interest in future technologies. This model is not only effective in explaining the process of UD of a new product among consumers but also provides useful implications for the segmentation of users. In the UD model, satisfaction with a technology may spur more usage in a dynamic process. In addition, many researchers have found that customer satisfaction and usage are highly correlated [32], [33]. Further, the greater the number of consumers satisfied with a new product, the higher the odds for success of diffusion for that product.

In the diffusion model of tablet-PCs, proposed in this study, we chose positive behavior intention as the dependent variable.

Meanwhile, satisfaction and trust were chosen as the mediators, and a series of variables belonging to technological dimension and alternative attractiveness were chosen as the independent variables, as shown in Fig. 2.

Among the variables belonging to the technological dimension, while playability and cost level are variables that are used in acceptance models, 'user interface (UI)' is a variable related to the evaluation of tablet-PCs by users who have used one. In this study, of the many UI elements, touch interface, graphical interface, and web-based interface were deemed relevant for tablet-PCs and were selected as areas for measurement of UI quality.

Alternative attractiveness is a concept deriving from "social exchange theory." Jones and others (2002) defined alternative attractiveness as "the degree of attractiveness of the product a user considers the most attractive compared with other products he or she is currently using" [34]. Several studies also found that consumer satisfaction with a product and the probability of switching one's behavior are both influenced by alternative attractiveness [35].

Numerous studies have analyzed the influence that satisfaction has on positive behavior intention. Jeon and others (2011) show in their study on mobile IPTV that satisfaction has an impact on relative attractiveness and stimulates behavioral intention [36]. Moreover, a study by Park and others (2008) confirms that customer satisfaction with mobile RFID service has a great impact on positive behavioral intention [37].

III. Research Methodology

1. Sampling

As of July 2010, less than 1% of consumers nationwide in Korea have used a tablet-PC. For this reason, we used quota sampling, a method in which a sample is required to be chosen from a specific subgroup, according to minimum quotas, to sample two groups: consumers currently using a tablet-PC and consumers who are not currently using one. The same quotas were set by taking into consideration age groups and population projections for each region. All respondents were people living in Korea, aged 15 to 59, who have decision-making power over the purchase of a telecom device or service, or have an influence on such decision-making within their households.

Through face-to-face interviews and an online survey, conducted between July and August 2010, we obtained 800 total responses, 770 of which were retained for statistical analysis, after discarding incomplete or otherwise invalid responses. Of the 770 total respondents, 177 were currently using a tablet-PC, while the remaining 593 were not.

2. Scale and Items

In this study, we carried out a pilot test to check the validity and reliability of the content of the questionnaires prior to the survey. The pilot test was carried out by targeting 20 graduate students (business administration majors); then, items showing low validity and reliability were eliminated, and the sentences were rewritten to make the questionnaires more coherent.

Respondents who are currently using a tablet-PC were asked to provide the brand, name of the manufacturer, date of purchase, and cost of purchase and use, and to answer questionnaire items related to their satisfaction of the model.

Non-users, meanwhile, were provided video-show cards, explaining the concept of tablet-PCs, their functions and features, designs, price range, and method of use. Surveyors made sure that respondents of the latter category perused the show cards before answering the survey questions related to the acceptance model.

The operational definitions of the variables and measurement items used in the acceptance and diffusion models of this study are provided in Tables 1 and 2.

IV. Results

1. Demographics of Sample

The demographic characteristics of the respondents are as follows: by sex, women accounted for a larger share (64.8%) of the total respondents than men; by age group, people in their 20s represented the largest share (35.6%); by level of education, college students and college graduates represented a majority (64.5%); in terms of household composition, two-generation households (parents and children) represented the vast majority (73.9%); by household income, the largest share (43.7%) was accounted for by families earning 2 to 3.9 million won per month.

Meanwhile, concerning how often the respondents purchased new IT products, the average was 1.9 times a year. Those who purchased one to three times a year accounted for the largest share, being 37.3%. Korean consumers, therefore, appeared generally willing to purchase new IT products.

2. Results of Confirmatory Factor Analysis on Research Models

The results of the confirmatory factor analysis performed on the acceptance and diffusion models of tablet-PCs are given in Tables 3 and 4. All standardized loadings were 0.5 or greater for both of the two models, with a composite reliability of 0.7 or greater. These results, coupled with an average variance

Table 1. Variables and measurement items of acceptance model.

Variables	Operational definition	Measurement items
Playability	The degree to which the use of a product is perceived as pleasurable, independently of the performance enhancement expected from it.	Kindles curiosity, Pleasure, Helps concentrate, Interesting experience
Cost level	The level of economic costs associated with acquiring and using a product, as perceived by a user.	Device price, Service fees
Functionality	The expected level of technical quality of a product.	Stable performance, Safety of use, Download performance, Malfunctions
Complexity	The extent to which a product is difficult to understand and its functions are complicated.	Complexity of the structure, Difficulty of using, Functions provided, Complexity of use
Self-efficacy	An individual's belief about his/her ability to perform certain tasks successfully.	Ease of control and operation, Convenient use, Possibility of efficient use
Innovativeness	The extent to which a consumer is ahead of others within a given social system, in innovation adoption.	Rapid adoption and use of a new service, Acquisition of various new knowledge, Innovative lifestyle, Challenging mindset
Perceived usefulness	The extent to which a consumer believes that the use of a new product can improve his or her quality of life and performance in carrying out tasks.	Assistance in everyday life, Usefulness, Comparative advantage compared to the existing products, Personal usefulness
Acceptance intention	A consumer's intention to adopt a new product or service.	Purchase intention, Valuable enough to purchase, Plan to purchase and use

Table 2. Variables and measurement items of diffusion model.

Variables	Operational definition	Measurement items
Playability	Same as for the acceptance model	
Cost level		
User interface	The extent to which a user perceives a product as easy to control and use, and its effectiveness.	Touch interface, Graphic interface, Web-based interface
Alternative attractiveness	The extent to which a viable alternative is available.	(when using an alternative device) Comparative level of satisfaction, Comparative level of economicality, Comparative level of efficiency
Satisfaction	Customers' post-purchase evaluations and overall affective responses to their service experience.	Satisfaction with the device, Purchase satisfaction, Choice satisfaction
Trust	A consumer's opinion about the reliability and stability of a product, formed from the experience of using it.	Trust in the device, Trust in the manufacturer, Trust in the service
Positive behavior intention	A consumer's favorable attitude and behavior toward a device and the related service after purchasing the device and using it.	Intention to continue using the product, Decision to continue using the product, Positive word-of-mouth intention

extracted (AVE) of 0.5 or greater, confirmed the existence of discriminatory validity [38].

To test the discriminatory validity of the two models in a more rigorous manner, we also checked whether they satisfied the requirement that 1.0 is not within the confidence interval (∅±2×standard error) of the coefficient of correlation between the constructs [39]. Also, whether the AVE is greater than the square correlation between the constructs was checked [40]. The results of the test to check whether the square root of the AVE of the two models exceeds the coefficient of correlation are provided in Tables 5 and 6. A 1.0 value was not within the 95% confidence interval (∅±2×standard error) of coefficient ∅, indicating the correlation between the constructs, and the square root of the AVE was greater than the coefficient of correlation for both models, confirming the discriminant validity of the constructs.

3. Model Fit and Standardized Regression Weights

To test the fit of the acceptance and diffusion models of tablet-PCs, we checked various reference values. To assess the overall fit of the two models, we checked the chi-square value, the most basic value for evaluating the overall fit of a measurement model. When the P-value for χ^2 is 0.05 or greater, the model is considered fit. In this study, the χ^2 of the acceptance model was 519.21, with a P-value of 0.000, and the χ^2 of the diffusion model was 233.86 with a P-value of 0.000, which do not satisfy the minimum requirements. However,

Table 3. Results of the confirmatory factor analysis: acceptance model

Variable	Measurement item	Standardized loading	Measurement error	t-value	Composite reliability	AVE
Playability	tpFun1	0.892	-	-	0.991	0.974
	tpFun2	0.920	0.031	32.487		
	tpFun3	0.897	0.035	27.802		
Cost level	tpCost2	0.919	0.058	15.265	0.981	0.964
	tpCost1	0.829	-	-		
Functionality	tpFunc3	0.884	0.073	17.372	0.977	0.934
	tpFunc2	0.775	0.057	20.34		
	tpFunc1	0.679	-	-		
Complexity	tpCpx3	0.896	0.083	17.25	0.973	0.925
	tpCpx2	0.959	0.087	17.16		
	tpCpx1	0.621	-	-		
Self-efficacy	tpSE1	0.85	-	-	0.991	0.972
	tpSE2	0.907	0.031	35.003		
	tpSE3	0.923	0.037	31.005		
Innovativeness	tpInno1	0.84			0.986	0.960
	tpInno2	0.873	0.041	24.409		
	tpInno3	0.786	0.045	21.26		
	tpInno4	0.775	0.047	20.806		
Perceived usefulness (PU)	tpPU1	0.902	-	-	0.993	0.976
	tpPU2	0.923	0.029	32.877		
	tpPU3	0.899	0.032	29.377		
	tpPU4	0.921	0.026	39.542		
Acceptance intention (AI)	tpAI1	0.936	-	-	0.993	0.980
	tpAI2	0.929	0.024	40.2		
	tpAI4	0.869	0.028	33.878		

Composite reliability = (Σ Standardized loading)2 / <(Σ Standardized loading)2 + (Error item of the measured variable)> : 0.7 or greater
Average variance extracted (AVE) = (∑ Standardized loading 2) / <(∑ Standardized loading 2) + (Error item of the measured variable)> : 0.5 or greater
※ Results of discriminatory validity testing with regard to the confirmatory factor analysis
χ^2= 575.07, *df* =257, p-value = 0.000, χ^2/df = 2.24, RMSEA = 0.046: GFI = 0.931, AGFI = 0.906, NFI = 0.961, IFI = 0.978, CFI = 0.978

Bentler and Mooijaart (1989) argued that χ^2 is excessively sensitive to the sample size, increasing the probability of rejection, and proposed that instead of the P-value on χ^2, the χ^2/df ratio be used as the criterion of fit [41]. In this case, the reference value for the fit of χ^2 /df is 5.0 or less.

In this study, the χ^2/df ratio of the acceptance model was 2.04 (519.21/254), and the χ^2/df ratio of the diffusion model was 1.40 (233.86/167). These values are below the threshold proposed by [41], hence indicating that the two models are fit to the data.

Aside from a chi-square, there are other statistical values such as goodness-of-fit-index (GFI), adjusted GFI (AGFI), normed fit index (NFI), incremental fit index (IFI), and comparative fit index (CFI) that are used to evaluate the fit of a model. As a general rule, a value above 0.9 is considered to indicate a good fit to the data. As for RMSEA, a value equal to or less than 0.05 is considered to indicate a good fit to the data. The two models proposed in this study were proven fit with regard to all indices, the detailed results of which are given in Table 7.

Next, having confirmed that the two research models fit to the data, we moved on to an analysis of the causal relationship in each of the paths of the two models. Tables 8 and 9 list the standardized regression weights of each path in the two models designed as structural equation models, along with their standard error, t-value, and level of significance.

Table 4. Results of confirmatory factor analysis: diffusion model.

Variable	Measurement item	Standardized loading	Measurement error	t-value	Composite reliability	AVE
Playability	tpFun2	0.822	-	-	0.977	0.934
	tpFun3	0.855	0.079	13.437		
	tpFun4	0.88	0.075	13.976		
Cost level	tpCost1	0.802	-	-	0.972	0.946
	tpCost2	0.929	0.086	11.861		
User interface	tpUI2	0.809	-	-	0.976	0.931
	tpUI3	0.872	0.078	13.987		
	tpUI4	0.914	0.09	14.444		
Alternative attractiveness (AA)	tpAA2	0.821	-	-	0.976	0.932
	tpAA3	0.852	0.077	13.367		
	tpAA4	0.896	0.083	14.137		
Satisfaction	tpSatis1	0.868	-	-	0.981	0.945
	tpSatis2	0.897	0.062	16.183		
	tpSatis3	0.831	0.069	14.101		
Trust	tpT4	0.846	-	-	0.972	0.921
	tpT2	0.815	0.058	12.579		
	tpT1	0.81	0.065	12.468		
Positive behavior intention	tpPBI3	0.876	-	-	0.983	0.950
	tpPBI4	0.936	0.084	18.502		
	tpPBI5	0.821	0.09	14.487		

※Results of discriminatory validity testing with regard to the confirmatory factor analysis
χ^2= 137.09, *df* =137, p-value =0.482, χ^2/df = 1.0, RMSEA = 0.002, GFI = 0.931, AGFI = 0894, NFI = 1.0, IFI =1.0, CFI =1.0

Table 5. Results of discriminant validity testing: acceptance model.

\	$\sqrt{AVE}$	Playability	Cost level	Functionality	Complexity	Self-efficacy	Innovativeness	PU	AI
Playability	0.987	1.000							
Cost level	0.982	0.201	1.000						
Functionality	0.966	0.768	0.162	1.000					
Complexity	0.962	0.114	0.269	0.143	1.000				
Self-efficacy	0.986	0.591	0.18	0.594	–0.153	1.000			
Innovativeness	0.980	0.37	–0.02	0.295	–0.022	0.329	1.000		
PU	0.988	0.787	0.108	0.696	0.12	0.581	0.377	1.000	
AI	0.990	0.661	–0.06	0.659	0.162	0.483	0.353	0.704	1.000

V. Conclusion and Implications

This study was an exploration of acceptance-diffusion strategies for tablet-PCs, conducted from the perspective of consumer perception. The existing literature on the acceptance and diffusion of IT devices was reviewed. Based on the results of this review, acceptance and diffusion models for tablet-PCs were proposed and empirically tested.

As for academic implications in this study, we were able to explain the process of acceptance of IT devices even without referring to PEU, which is a core parameter of TAM. We were also able to confirm that the higher level of complexity of a product leads to a greater increase in its PU. This shows that increased simplicity is not always the best factor in the design

Table 6. Results of discriminant validity testing: diffusion model.

\	$\sqrt{AVE}$	Playability	Cost level	User interface	Alternative attractiveness	Satisfaction	Trust	Positive behavior intention
Playability	0.966	1.000						
Cost level	0.973	–0.009	1.000					
User interface	0.965	–0.137	–0.74	1.000				
AA	0.966	0.107	0.567	–0.472	1.000			
Satisfaction	0.972	0.726	–0.185	0.115	–0.061	1.000		
Trust	0.960	0.621	–0.229	0.154	–0.058	0.789	1.000	
Positive behavior intention	0.974	0.665	0.024	–0.226	0.133	0.688	0.712	1.000

Table 7. Results of model fit testing.

Fit Index	Reference value	Acceptance model	Diffusion model
GFI	> 0.90	0.938	0.891
AGFI	> 0.90	0.915	0.850
NFI	> 0.90	0.964	0.921
IFI	> 0.90	0.982	0.976
CFI	> 0.90	0.981	0.976
RMSEA	< 0.05	0.042	0.048

Table 8. Standardized regression weights of paths: acceptance model.

Paths	Standardized regression weights	S.E.	t	p
Playability → PU	0.573	0.042	13.242	***
Cost level → PU	–0.07	0.029	–2.316	*
Functionality → PU	0.146	0.049	3.429	***
Complexity → PU	0.1	0.042	3.366	***
Self-Efficacy → PU	0.172	0.041	4.633	***
Innovativeness → Self-efficacy	0.349	0.044	8.042	***
PU → AI	0.883	0.052	18.471	***

χ^2= 519.21, df=254, p-value = 0.000, χ^2/df = 2.04, RMSEA = 0.042, GFI = 0.938, AGFI = 0.915, NFI = 0.964, IFI = 0.982, CFI = 0.981

of a new product.

The main implications for vendors are as follows:

First, the acceptance model proposed in this study shows very well the tremendous influence (t=8.042) of PU on the acceptance intention toward tablet-PCs. The model further confirmed that the four technological characteristics of the tablet-PC considered in this study, namely, playability (t=13.242), cost level (t=–2.316), functionality (t=3.249), and complexity (t=3.366), have a statistically significant influence on PU, and in the case of non-users, their level of self-efficacy had a positive influence (t=8.042) on PU. One interesting fact that emerged from our analysis was that the more complex a product, the higher its PU. This result may be interpreted to mean that today's consumers, armed with extensive experience using IT devices of various types, tend to perceive complex products that are complicated to use as more useful than others. The practical implication of this is that rather than stress simplicity, whether in product design or method of use, it is better for future emerging devices to be equipped with sophisticated and varying functions, even if this makes a device rather complicated to use.

Second, the diffusion model proposed in this study explains factors contributing to the user satisfaction of tablet-PCs, their trust in these devices, and their positive behavior intention toward them. Given the decisive influence that user trust and positive behavior intention have on the outcome of diffusion, it is important to understand what factors influence the level of satisfaction. According to the results of the survey of current tablet-PC users, playability (t=9.012) and user interface (t=2.002) have an influence on satisfaction. Cost level and alternative attractiveness, on the other hand, have proven to have little influence on satisfaction.

Third, the testing of the acceptance and diffusion models revealed that playability was the biggest influence on the acceptance-diffusion of tablet-PCs. This result is an indication that a tablet-PC is perceived, at least thus far, as a fun device, rather than a device that is a necessity in everyday life.

Fourth, when the diffusion model was tested against the data, we found that cost level had no significant influence on user satisfaction with a tablet-PC. This result is in contrast with the result from the acceptance model; namely, cost level has a negative influence on a non-user's intention to adopt and use a tablet-PC in the future. This result may be explained either by

Table 9. Standardized regression weights of paths: diffusion model.

Paths	Standardized regression weights	S.E.	t	p
Playability → Satisfaction	0.766	0.09	9.012	***
Cost level → Satisfaction	–0.022	0.088	–0.2	N.S
UI → Satisfaction	0.206	0.086	2.002	*
AA → Satisfaction	–0.006	0.074	–0.072	N.S
Satisfaction → Trust	0.802	0.067	10.428	***
Trust → Positive behavior intention	0.504	0.167	3.694	***
Satisfaction → Positive behavior intention	0.302	0.137	2.362	***

χ^2= 233.86, *df*=167, p-value = 0.000, χ^2/df = 1.40, RMSEA = 0.048, GFI = 0.891, AGFI = 0.850, NFI = 0.921, IFI = 0.976, CFI = 0.976

the fact that those who are currently using a tablet-PC are innovators or early adopters for whom cost is not really a factor. The result may also owe to the fact that there is little cost involved in using a tablet-PC, aside from the cost of purchase. Certainly, cost level is unlikely to be a major obstacle for the diffusion of tablet-PCs. The results also confirmed that alternative attractiveness, even if quite strong, does not affect the level of satisfaction with tablet-PCs among current users.

In this study, we confirmed the existence of factors that exert an impact on the acceptance and diffusion of a new IT product, using a structural equation model that has been employed in numerous socio-scientific studies. However, this study is differentiated from earlier studies in that it proposes phased indications by dealing with both the acceptance model and the diffusion model, while the majority of the foregoing studies propose marketing strategies for a new product by separating the two models.

The findings of this study are likely to contribute toward the drawing up of an effective acceptance and diffusion strategy for tablet-PCs. The results are also rich in implications for product strategies for emerging devices other than tablet-PCs.

Meanwhile, this study had the following limitations. First, it attempted to explain the acceptance and diffusion of new IT productions by configuring a research model using only a limited range of factors. As such, future studies will have to design a model in consideration of more diverse psychological and contextual factors. Second, this study collected data using only an online questionnaire-based survey, due to financial and temporal constraints. To conduct a more accurate study, both online and offline surveys will have to be made to compare the results. Third, the number of samples used in this study came to a mere 770, that is, less than 0.001% of the Korean population. Future studies should increase the number of samples and enhance their representation to ensure a more generalized research result.

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