Understanding the Determinants of Behavioral Intentions towards Adoption of Web 2.0 Tools in Workplaces : An Empirical Study

Tao Wang* · Chul-Ho Jung** · Young-Soo Chung***

Abstract

More and more employees are implementing the use of emerging Web 2.0 tools such as blogs, wikis, social networks, etc in workplaces. However, their attitudes towards adoption of Web 2.0 tools in workplaces still lack theoretical support. The purpose of this study aims to provide a conceptual examination of the determinants that influence the intention to use Web 2.0 applications in workplaces in Korea. To achieve this objective, this study selected the theory of reasoned action (TRA) as a theoretical basis to explain variation in behavioral intentions. Structural equation modeling was employed to analyze data collected from 269 workers distributed in 5 companies in Korea. In addition, we classified respondents into extroverts and introverts and delineated the different factors for these two types of respondents that affect their intentions to use Web 2.0 tools in workplaces. The findings of this research could provide a theoretical foundation for academics on the validation of technology adoption. This research will also serve as a guideline for service providers in designing the Web 2.0 services.

Keywords : Web 2.0 Tools, TRA, Behavioral Intention, Introverts, Extroverts

Received : 2011. 06. 23. Final Acceptance : 2011. 09. 07.

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1. Introduction

The advancement of information technology, coupled with the growing prevalence of the Internet, is promoting Web 2.0 as one of the most promising innovations in the past few years [Chua and Goh, 2010; Dearstyne, 2007; Levy, 2009]. Compared to previous Web1.0 tools, Web 2.0 tools can provide more flexible participation as well as more effective interaction and collaboration between users [Dearstyne, 2007; Usluela and Mazman, 2009]. The use of blogs, wikis, rss and social networks is not restricted in public domain; their impacts have also entered into business domain [McAfee, 2006]. The business benefits of using Web 2.0 tools in organizations include active participation, critical correlation, social presence and collaborative knowledge sharing [Levy, 2009]. Web 2.0 tools have become more widely used by workers in organizations to describe a collection of organizational and communication technology constructs that help organizations better engage their workers by enabling knowledge sharing, and community building [McAfee, 2006]. By using Web 2.0 tools within organization, external and internal knowledge as well as internal communication processes on the whole are expected to be improved. Recently, there has been a dramatic proliferation in the number of Web 2.0 tools [Levy, 2009]. Due to the high potential benefits of Web 2.0 tools and technologies, an increasing amount of organizations are also interested in encouraging their workers to use them among colleagues [Dearstyne, 2007]. However, no theoretical literature is published about what motivates workers to adopt and participate in Web 2.0 tools and activities. This reason reinforces the urgency and importance of conducting this research. The principal objective of this research seeks to validate a comprehensive model of individuals' acceptance in the context of Web 2.0. The theoretical framework for this study is based on the Fishbein and Ajzen's theory of reasoned action (TRA), which uses inherent behavioral concepts to explain and predict human behaviors. Individual's responses to questionnaire items about attitude and intention to adopt Web 2.0 tools were collected and analyzed. The research takes Korea as the site of the empirical investigation because the IT infrastructure required for Web 2.0 developments has been put in place. It provides a solid foundation for using Web 2.0 tools in Korean companies. Such favorable conditions are also conductive to the promotion of workers' participation in Web 2.0 activities.

Unlike past studies that focused solely on individuals' internal motives (in term of usefulness and ease of use, derived from the Technology Acceptance Model), this study is conducted with the following purpose : 1. to study the potential impact of network externality and compatibility, social presence on intention to adopt Web 2.0 tools in workplaces; 2. to assess the applicability of an extended Theory of Reasoned Action (TRA) model. In the next section, we review the representative Web 2.0 tools that currently exist and examine prior research on issues of Web 2.0. Section 3 develops an exploratory conceptual model based on the revised TRA model, and presents research hypotheses

and constructs. We will outline research methodology and results in Section 4. Conclusions and research implications will be provided in Section 5.

2. Theoretical Background

2.1 Overview of Web 2.0 tools

A plenty of applications have already existed in organizations such as, instant messaging, e-mail and discussion forums etc, providing communications among workers, however, they were lack of effective knowledge sharing, interaction and collaboration [Levy, 2009]. McAfee categorized the information technologies that workers currently use into two categories : channels and platforms. Channels are easy tools for individuals to generate information but have low visibility to other ones, while platforms are applications where information is broadly visible but is typically generated by a smaller group of employees [McAfee 2006]. However, many workers aren't satisfied with the existing channels and platforms available to them. The most fundamental problem is that these technologies aren't doing a good job of capturing knowledge throughout the companies [Levy, 2009]. Web 2.0 technologies have their biggest impacts on knowledge work, innovation processes and cooperation among workers.

In conclusion, the potential value of using Web 2.0 tools in workplaces includes : 1. Quicker access to expertise and resources, Web 2.0 tools enable individuals to more quickly identify who could help them or help them find relevant resources. 2. Swifter innovation is actualized. Organizational innovation has been demonstrated to stem largely from connection and collaboration between individuals and teams that have complementary expertise or perspectives. 3. Enhanced collaboration is also ensured. While collaboration usually does not happen directly on social networks, the mutual knowledge and trust that develops from other workers facilitates quicker engagement and more effective collaboration [Levy, 2009; McAfee, 2006; Usluela and Mazman, 2009]. The most common Web 2.0 tools including blogs, wiki, and social network which are discussed as follows :

(1) Blogs

Blogs are social tools that enable users, without requirement of any technical skill, to create, publish and organize their web pages that contain dated content, entries, comments, discussion etc. in chronological order [Dearstyne, 2007]. Blogs have a variety of formats and might include the user expressing their opinions about a topic or documenting activities [Levy, 2009]. Blogs are interactive in the sense that other users could provide comments on the information posted by the blog authors [Chua and Goh, 2010]. It is suggested that blogs encourage critical thinking with collaborative working, and provide feedback [Ajjan and Hartshorne, 2008; Dearstyne, 2007].

(2) Wikis

Wikis refer to collaborative websites that allow users to interact by adding, removing, or editing site content [Chua and Goh, 2010]. As wikis are free open source software, no one au-

thorizes the creation of wiki pages and everyone is automatically authorized to write, edit and publish. Wiki engines enable easy creation of links between terms, pages and titles, enlarging in another dimension of knowledge sharing [Dearstyne, 2007]. Wikis are considered to be effective tools for interaction and collaboration as they facilitate collaborative working, promote creativity, encourage critical searching [Ajjan and Hartshorne, 2008].

(3) Social Networking

Social networking is the software that supports collaboration, knowledge sharing, interactions and communications of users from different places who come together with a common interest, need or goal [Levy, 2009]. Social networks are also known as range of applications that augment group interactions and shared spaces for collaboration, social connections, and aggregate information exchanges in a web-based environment [Chua and Goh, 2010]. Social networks can also be viewed as pedagogical tools that stem from their affordances of information discovery and sharing, attracting and supporting networks of people and facilitating connections between them, engaging users in informal learning and creative, expressive forms of behavior [Levy, 2009; Usluela and Mazman, 2009].

2.2 Theory of Reasoned Action (TRA)

A number of theoretical models and theories have been proposed to facilitate the understanding of diffusion and acceptance of information technologies or innovations [Ajzen, 1991; Davis et al., 1989; Rogers, 2003]. When studying in Web 2.0 context, it is necessary to consider individual's decision processes and features of innovation both [Bhattacherjee, 2000]. In this paper, TRA model was adopted as the theoretical foundation to construct our research model. The TRA was introduced by Fishbein and Ajzen [1975] in order to understand behavioral intentions. TRA has been used as the basis to test several technologies spanning a variety of subject areas. The theory states that an individual's behavior is predicted by his/her intention to perform the behavior. An individual's intention to perform a behavior predicts the likelihood of that behavior being performed and represents the effort that an individual is willing to exert to perform the behavior. In TRA, the behavior intention of performing a particular behavior is determined by a personal factor and a social factor [Fishbein and Ajzen, 1975]. The personal factor is represented by attitude towards the behavior and the social factor is represented by subjective norm [Fishbein and Ajzen, 1975]. Attitude reflects an individual's overall assessment of the behavior under investigation, whereas subjective norm refers to an individual's perceived pressure from society or referent others to perform or not perform that behavior.

2.3 Personal Beliefs

Personal beliefs are defined as one's perceptions of a new technology that influence his or her attitude towards the use of that technology.

Taylor and Todd [1995] decomposed IT beliefs as perceived usefulness, perceived ease of use and compatibility in DTPB based on innovation diffusion theory. Since Web 2.0 tools are the kinds of innovative communication tools, perceived usefulness, perceived ease of use and compatibility should collectively affect attitude towards adoption of Web 2.0 tools in workplaces. Besides, social context is an important characteristic of Web 2.0 tools [Gefen and Straub, 2003; Straub and Karahanna, 1998], user's perceived social presence is assumed to be another important personal belief in explaining attitude towards behavioral intentions.

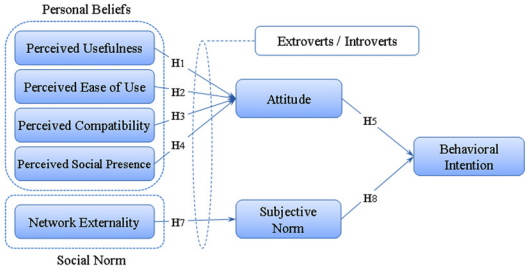
2.4 Social Norms

Subjective norm consists of the pressure on the individuals to conform to the expectation of the social environment [Fishbein and Ajzen, 1975]. Such expectation mainly comes from their peers or friends who consider the technology worthy of being recommended or suggested. The effect of network externality is found to be the most significant social norm of Web 2.0 tools [To et al., 2008]. That is, when the number of users is small, the value of Web 2.0 tools is also limited; on the contrary, when the number of users increases, the value of Web 2.0 tools increases accordingly. Once the network externality is achieved, it could be helpful in developing more positive subjective norm [Hsu and Lu, 2004]. To et al. [2008] indicated that network externality was an important social norm in determining social software adoption. In this paper, we propose network externality has an indirect effect on Web 2.0 adoption via subjective norm.

3. Research Model and Hypotheses

3.1 Research Model Formation

The theoretical framework for this study was based on the Fishbein and Ajzen's theory of reasoned action (TRA). Our research empirically examined the determinants that affected individual's behavioral intention to use Web 2.0 tools in workplaces.



〈Figure 1〉 Research Model

(1) Perceived Usefulness

Perceived usefulness is defined as a person's subjective evaluation of the extent of using an innovation that would enhance the individual's job performance [Davis et al., 1989]. In the context of Web 2.0, perceived usefulness would be the degree to which an individual views Web 2.0 tools as offering more advantages over previous technologies. Perceived usefulness has been proven to be an antecedent of attitude [Davis et al., 1989; Taylor and Todd, 1995]. Positive attitude could be established as there are many advantages of using Web 2.0 applications. Thus, we hypothesize :

H1 : Perceived usefulness will be positively related to attitude towards behavioral intentions

(2) Perceived Ease of Use

Perceived ease of use is defined as the expectation by an individual of the degree to which the innovation will be free from effort [Davis, 1989]. In the context of Web 2.0, perceived ease of use would be the degree to which Web 2.0 tools would be perceived as easy to understand, learn and use. With less complexity in using a technology, a positive attitude could be developed subsequently towards the intention and behavior. Researchers have proven perceived ease of use to have a direct relationship towards attitude [Bhattacherjee, 2000; Taylor and Todd, 1995]. Hence the following hypothesis is formulated :

H2 : Perceived ease of use will be positively related to attitude towards behavioral intentions

(3) Perceived Compatibility

Compatibility is the "degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters" [Rogers, 2003]. Compatibility is the degree to which an innovation is perceived as being consistent with the individual values, needs, and past experiences of potential adopters [Rogers, 2003]. Applied to Web 2.0 domain, compatibility is defined as the extent to which individuals believe that using Web 2.0 tools would be compatible with their jobs. Our study suggests that perceived compatibility is also important in forming positive attitudes towards Web 2.0 tools. Hence,

H3 : Perceived compatibility will be positively related to attitude towards behavioral intentions

(4) Perceived Social Persence

Social presence has been defined as the extent to which a medium allows users to experience others as being psychologically present [Fulk et al., 1987]. Social presence is characterized by some researchers as the capability of the medium to transmit information richness (such as text, picture, video, etc.) [Straub and Karahanna, 1998]. Many researchers have emphasized that perceived social presence is an important construct for future study. Recent studies have shown that perceived social presence impacts user's online behaviors [Gefen and Straub, 2003; Straub and Karahanna, 1998]. This study extends the research of perceived social presence in the Web 2.0 domain. In this study, perceived social presence is assumed to be related to the levels of attitude towards behavioral intentions.

H4 : Perceived social presence will be positively related to attitude towards behavioral intentions

(5) Attitude

Attitude is an important variable that predicts behavioral intentions [Fishbein and Ajzen, 1975]. In the TRA, attitude towards object is the function of the individual's belief towards the object and the individual's implicit evaluation of the beliefs he/she holds [Fishbein and Ajzen, 1975]. Studies have proven significant direct relationship of attitudes towards behavioral intentions [Davis et al., 1989; Taylor and Todd, 1995].

Hence the proposed hypothesis is :

H5 : Attitude will be positively related to behavioral intentions

(6) Network Externality

Network externality is a social factor which refers to the fact that the value of technology would increase with the number of users [Hsu and Lu, 2004]. Once the number of users of a new technology reaches a critical mass, individuals would be more likely to adopt the technology. This rule could also apply to the usage of e-mail and instant messaging. Some prior studies indicated that network externality was an important factor in predicting individual's adoption of new technologies [Hsu and Lu, 2004], especially social technologies. This study proposes that network externality has a positive social influence on subjective norm and has an indirect impact on behavioral intentions.

H6 : Network externality will be positively related to behavioral intentions

(7) Subjective Norm

Subjective norm is defined as an individual's subjective evaluation that the performance of the behavior is approved or disapproved by most people who are important to him or her [Ajzen, 1991; Fishbein and Ajzen, 1975]. According to Fishbein and Ajzen [1975], subjective norm is a function of the perceived expectation by individual or group who are important to the person and by the persons' motivation to comply with the expectations [Fishbein and Ajzen, 1975; Taylor and Todd, 1995]. Thus we hypothesize that :

H7 : Subjective norm will be positively related to behavioral intentions

(8) Behavioral Intentions

Finally, many prior studies have proven that intention to use is a close antecedent of actual behavior, and there is a high correlation between actual behavior and intention [Ajzen, 1991; Davis et al., 1989; Taylor and Todd, 1995]. Thus, in this paper, behavioral intentions are adopted as a dependent variable instead of actual behaviors. Besides, there is another reason for the adoption of behavioral intentions instead of actual behaviors. The topic of Web 2.0 tools is still a new topic and development of Web 2.0 still remains at the preliminary stage, thus, compared to actual behaviors behavioral intentions would be a more appropriate and practical variable to be considered when studying Web 2.0 adoption.

4. Research Design and Methodology

4.1 Measurement Development

The questionnaire was designed by adopting measurements from previous studies with good validity and reliability. The measurement of behavioral intentions, attitudes and subjective norm were adopted from the study of Fishbein and Ajzen [1975]. Perceived usefulness and perceived ease of use were adopted from the study

〈Table 1〉 Measurement of Research Variables

Constructs	Definitions	References
Perceived usefulness	The degree to which one believes that using a particular system would enhance his or her job performance.	Davis [1989]
Perceived ease of use	The degree to which one believes that using a particular system would be free of effort.	Davis [1989]
Perceived compatibility	The degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs.	Roger [2003]
Perceived social presence	The extent to which a medium allows ones to experience others as being psychologically present (text, picture, video, etc.).	Gefen and Straub [2003]
Attitude	The function of the individual's belief towardss the object and the individual's implicit evaluation of the beliefs he/she holds	Fishbein and Ajzen [1975]
Subjective norm	The perceived pressures to one to perform or not to perform a given behavior.	Fishbein and Ajzen [1975]
Network externality	The degree to which the people around (business relations, peers, supervisors, etc.) are using the new technology.	Hsu and Lu [2004]
Behavioral intentions	An individual's subjective probability of performing a specified behavior.	Fishbein and Ajzen [1975]

of Davis [1989]. Perceived compatibility was adopted from the study of Roger [2003], Network externality from Hsu and Lu [2004]. Perceived social presence was adopted from Gefen and Straub [2003]. All of the items were measured using a five point Likert-scale (from strongly disagree to strongly agree) to examine factors that influence individuals' intentions to utilize Web 2.0 tools. The survey items are included in <Table 1>.

Before conducting the formal survey, a pilot test was conducted to test the validity and reliability of the questionnaire with 10 graduate students who were MIS majors and frequent Web 2.0 users. Respondents were asked about any difficulty they may have encountered in the survey (ambiguous questions or terms). They were also asked about their opinions of the survey in general. Comments and suggestions on the item contents and structure of the instrument were solicited.

4.2 Survey Procedure

The research took Korea as the site of the empirical investigation because of its well-developed IT industry and supporting infrastructure. The formal survey was undertaken from May 2nd to 13rd, 2011. The sampling population of the study consisted of five companies' employees in Seoul and Daejeon who used computers to support their daily work. Respondents were selected by means of a convenience sampling method. Finally, a total of 274 responses

〈Table 2〉 Characteristics of Respondents (n= 269)

Measure	Items	Freq.	Per.(%)	Measure	Items	Freq.	Per.(%)
Gender	Male	183	68.0	Position	Executive/Top management	2	0.7
	Female	86	32.0		Middle management	17	6.3
Age	Less than 25 years old	28	10.4		Supervisory	26	9.7
	26~35 years old	143	53.2		Professional	39	14.5
	36~45 years old	91	33.8		Technical	74	27.5
	Older than 46 years old	7	2.6		Clerical	84	31.2
Education level	High school or below	23	8.5		Other	27	10.1
	Associate degree	87	32.3	Online experience	Less than 3 years	26	9.7
	Bachelor degree	116	43.2		3~8 years	170	63.2
	Master degree	43	16.0		More than 8 years	73	27.1

were received, of which 269 were accepted as valid responses for further analysis. To assess the possible existence of non-response bias, t-test was performed on the responses of the respondents to see if different groups were different. The results of the t-test showed no difference in the responses of different groups, suggesting that there was no evidence of non-response bias. About 58% of the respondents (n = 156) had already adopted and were using Web 2.0 tools in workplaces, while nearly 42% (n = 113) were still non-adopters. About 32% (n = 86) were from the manufacturing sector and the remaining about 68% (n = 183) belonged to the service sector. The majority of the sample was 26~35 years old. The demographic profile showed that users were relatively young and generally well educated. Such workers would very likely become the most active Web 2.0 users and the most representative group in the Web 2.0 domain.

5. Data Analysis

5.1. Model Validation

All of the constructs in this study were examined in terms of reliability, convergent validity, and discriminant validity. Reliability was established by calculating Cronbach's alpha and composite reliability (CR) to measure internal consistency. As shown in <Table 3>, all values were above the recommended level of 0.7. For convergent validity, according to the criteria suggested by Fornell and Larcker [1981], all of the factor loadings should not only be significant but also should exceed 0.7 and average variance extracted (AVE) by each construct should exceed the variance due to measurement error for that construct. As listed in <Table 3>, all items exhibited loadings greater than 0.7 on their respective constructs. All AVE values were larger than the variance due to measurement error.

Thus, convergent validity was ensured [Bagozzi and Phillips, 1991]. Discriminant validity was examined using criteria suggested by Fornell and Larcker [1981]. The square root of the AVE should be greater than the correlation shared between the construct and other constructs. <Table 4> presents the correlations among constructs, with the square root of AVE on the diagonal. The correlation between each pair of constructs was less than the square root of AVE, providing evidence of discriminant validity.

〈Table 3〉 Construct Reliability and Convergent Validity

Constructs	Items	Loading	CR	AVE	Alpha
Perceived Usefulness	PU1 PU2 PU3	0.864 0.820 0.795	0.8662	0.6836	0.8100
Perceived Ease of Use	PEU1 PEU2 PEU3	0.863 0.822 0.709	0.8418	0.641	0.7584
Perceived Compatibility	PC1 PC2 PC3	0.821 0.789 0.761	0.8333	0.6252	0.7633
Perceived Social Presence	PSP1 PSP2 PSP3	0.816 0.780 0.700	0.8101	0.5881	0.7100
Network Externality	NE3 NE2 NE1	0.829 0.776 0.732	0.823	0.6084	0.7906
Attitude	ATT2 ATT3 ATT1	0.845 0.824 0.713	0.8378	0.6338	0.8127
Subjective Norm	SN1 SN2 SN3	0.877 0.848 0.816	0.8842	0.718	0.8860
Behavioral Intention	BI3 BI2 BI1	0.851 0.818 0.711	0.8372	0.6329	0.7942

〈Table 4〉 Discriminant Validity : Square Root of AVEs and Factor Correlation Coefficients

	SN	ATT	BI	NE	PU	PC	PSP	PEU
SN	**.847**							
ATT	.362**	**.796**						
BI	.407**	.353**	**.795**					
NE	.317**	.397**	.294**	**.780**				
PU	.108	.338**	.205**	.268**	**.827**			
PC	.281**	.297**	.122	.309**	.103	**.791**		
PSP	.317**	.338**	.293**	.349**	.319**	.321**	**.767**	
PEU	.270**	.197**	.110	.311**	.077	.286**	.208**	**.800**

* : $p < 0.05$; ** : $p < 0.01$; *** : $p < 0.001$.

5.2. Tests of the Measurement Model

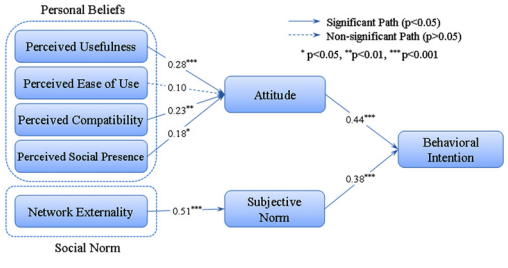
To assess how well the model represented the data, we evaluated goodness of fit indices : Chi-square/degrees of freedom, the goodness-of-fit index (GFI), the normed fit index (NFI), the incremental fit index (IFI), the comparative fit index (CFI), and the room mean square error approximation (RMSEA). <Table 5> shows that the research model provides a good fit to the data except GFI and NFI. The χ^2/df was 1.83, the remaining four indices (NFI = 0.84; GFI

〈Table 5〉 Model Fit Indices

Index	Value	Recommended value	References
χ^2/d.f.	1.83	Good fit (should ≤ 3)	Bentler et al. [1980]
GFI	0.87	Not a good fit (should ≥ 0.90)	Hair et al. [1998]
NFI	0.84	Not a good fit (should ≥ 0.90)	Bentler et al. [1980]
IFI	0.91	Good fit (should ≥ 0.90)	Hair et al. [1998]
CFI	0.90	Good fit (should ≥ 0.90)	Bentler et al. [1980]
RMSEA	0.06	Good fit (should ≤ 0.10)	Hair et al. [1998]

= 0.87; IFI = 0.91; CFI = 0.90; RMSEA = 0.06). Therefore, we conclude that goodness of fit indices roughly accord with the recommended levels, suggesting that the research model provided a good fit to the data.

The standardized path coefficients for the research model are presented in <Figure 2>. Most of the paths were significant in the expected direction. Exception was one path connecting perceived ease of use and attitude. Results indicated that usefulness, compatibility and social presence of Web 2.0 were key determinants of attitude. This finding provided empirical supports for Gefen and Straub [2003]'s proposition that social presence levels had significant impacts on individual's subjective evaluation. In accordance with the TRA, attitude and subjective norm were positively related to behavioral intentions. Additionally, the influence of network externality had positive influence on the subjective norms.



〈Figure 2〉 The Standardized Path Coefficients for all Respondents (n = 269)

〈Table 6〉 Hypotheses-testing for all respondents

Hypothesized paths	Est.	S.E.	C.R.	p
Social presence → Attitude	.176	.073	2.419	.016*
Usefulness → Attitude	.281	.077	3.662	.000***
Ease of use → Attitude	.095	.060	1.582	.114
Compatibility → Attitude	.233	.077	3.012	.003**
Network externality → Subjective norm	.511	.105	4.848	.000***
Attitude → Behavioral intention	.436	.125	3.483	.000***
Subjective norm → Behavioral intention	.380	.073	5.201	.000***

* : $p < 0.05$; ** : $p < 0.01$; *** : $p < 0.001$.

Contrary to previous studies, perceived ease of use did not affect attitude towards behavioral intentions. A possible reason may be that ease of use is no longer the main issue for employees to consider. Since the predominant merit of most Web 2.0 tools is easy to learn and easy to use and most respondents obtained online experiences for more than 3 years, the difficulty of operation for them is reduced.

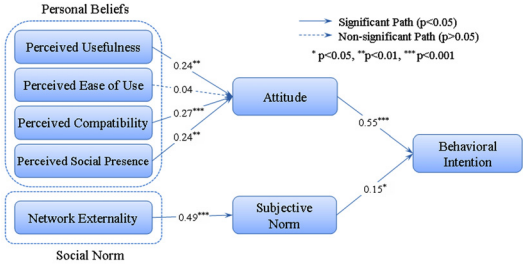
5.3 Analysis between Extroverts and Introverts

Prior studies have found that extroverted people and introverted people exhibit different behaviors on the Internet. The impacts of extroversion or introversion on individuals' online behaviors were considered as an important issue in some past IS studies. Extroverted people are primarily oriented to social settings, while introverted people are more interested in an internal environment. In recent years, more and more studies have been exploring the relationships between extroverted people and introverted people and their corresponding behaviors over the internet. In this paper, we conducted a comparative analysis between extroverted respondents and introverted respondents based on their responses to the questionnaire items

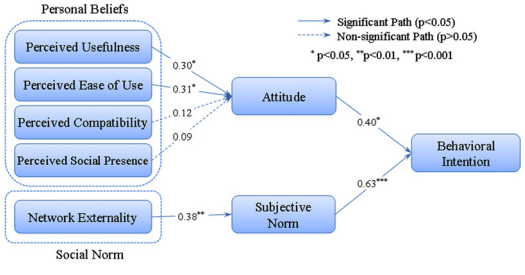
(please refer to <table 7>). The results of our classifications showed that 56.1% of all the respondents considered themselves as extroverts while a minority (43.9%) referred themselves as introverts.

〈Table 7〉 The Classification of Extroverts and Introverts

Questionnaire Items	Type
I am motivated from "without" and my attention is directed outward. When I are feeling low in energy, or stressed, I am likely to look outside myself for relief.	Extroverts
I am motivated from "within" and I am oriented towards the inner world of ideas, imagery, and reflection. When I am tired or stressed, I am likely to engage in reflective activity.	Introverts



〈Figure 3〉 Test Result of Research Model for Introverted Respondent (n = 118)



〈Figure 4〉 Test Results of Research Model for Extroverted Respondents (n=151)

As we can see from <Figure 3> and <Figure 4>, extroverted respondents are more likely to be influenced by people around them when making a decision to adopt a new technology, while introverted respondents are more likely to be influenced by their subjective evaluation of the new technology.

In addition, to extroverted respondents, perceived usefulness and perceived ease of use are proved to have significant effects on attitude towards adoption instead of compatibility and social presence. The results indicate that extroverted individuals emphasize the practical utility and operability of a new technology in organizations. Our comparative analysis also indicates that introverts place more emphasis on the perceived compatibility of a Web 2.0 tool than perceived social presence and perceived usefulness. This means that introverted respondents are more likely to be risk-averse, past personal experiences and work style may both play a more decisive role in introvert's decision process when adopting a new technology.

6. Implications and Limitations

By offering understanding of factors affecting individual's behavioral intentions to use Web 2.0 tools in workplace, the findings of this research not only provide researchers with theoretical foundations to study adoption of other social software, but also provide implications for service providers to develop more effective Web 2.0 services and tools

From a theoretical perspective, this study proposes and validates a new model for adoption

of Web 2.0 tools in workplaces. Our model validates relationships that have been shown in some previous studies (such as the influence of perceived usefulness, ease of use, compatibility on attitude), and validates new relationships (such as the influence of social presence on attitude and the influence of network externality on subjective norm). This study also classifies Web 2.0 users into extroverts and introverts and delineates the different factors for these two types of respondents that affect their intentions to use Web 2.0 tools in workplaces. Another contribution of this study is that it is the first study to show that social presence has a direct impact on attitude and also to verify the impact of network externality on subjective norm in the context of Web 2.0 adoption.

From a practitioner point of view, the results from this study have several implications for designers of Web 2.0 applications. Web 2.0 tool developers should consider utilities, compatibility and social presence in their application designs, as these factors can have positive impacts on the positive attitude formation within their customers. Service providers should try to offer more intimate and customized service, in addition, text, pictures and other emotional or dynamic elements which are considered to be an effective way to enhance individual's sense of social presence would be preferred when designing the Web 2.0 tools. While our study also shows that network externality has a direct impact on subjective norm. This is an important finding because network externality is not a part of original TRA model as a normative belief. Thus, the method of promoting and reaching the critical mass as soon as possible, especially during the early stage of product promotion period, would be an important topic for service providers to consider.

Although the findings mentioned above are useful, this study has certain limitations. There are three main limitations of this research that should be noted. First, future works should determine the extent to which the findings presented in this paper apply to the adoption of other innovations, especially social innovations. Second, another limitation of this study is that the sampling procedure is not randomized. However, the sources of the samples are diversified for including different companies, industries and regions, and also for avoiding sampling bias. The respondents should still be representative and appropriate sample for Web 2.0 adoption study. Third, although the samples of this research include 269 data from Web 2.0 users in workplaces, it is surveyed within only five companies located in Seoul and Daejeon. Therefore, it is limited to generalize the findings to whole Korea society. A bigger sample size throughout the whole nation would have been better.

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<Appendix> Survey Questionnaire Items

	Questionnaire items
Perceived Usefulness (PU)	
PU1	Using Web 2.0 tools in workplace would decrease the time needed for accomplishing my tasks.
PU2	Using Web 2.0 tools in workplace would enable me to improve my performance on my job.
PU3	Overall, I will find Web 2.0 tools to be useful in my task.
Perceived Ease of Use (PEU)	
PEU1	I would find it easy to get Web 2.0 tools to do what I want to do.
PEU2	Learning to use Web 2.0 tools would be easy for me.
PEU3	It's easy for me to become skillful at using Web 2.0 tools.
Perceived Compatibility (PC)	
PC1	I think that using the Web 2.0 tools in workplace fits well with the way I like to work.
PC2	Using Web 2.0 tools in workplace is compatible with all aspects of my work.
PC3	Using Web 2.0 tools fits into my work style.
Perceived Social Presence (PSP)	
PSP1	There is a sense of sociability in Web 2.0 tools.
PSP2	There is a sense of human sensitivity in Web 2.0 tools.
PSP3	There is as sense of human interaction in Web 2.0 tools.
Attitude (ATT)	
ATT1	Using Web 2.0 tools in workplace is a good idea.
ATT2	I like using Web 2.0 tools in workplace.
ATT3	The thought of using Web 2.0 tools in workplace is appealing to me
Network Externality (NE)	
NE1	Many people around me are using Web 2.0 tools.
NE2	My colleagues are involving in Web 2.0 tools.
NE3	The resource in Web 2.0 tools is rich and appealing.
Subjective Norm (SN)	
SN1	People who influence my behavior think that I should use Web 2.0 tools in workplace.
SN2	People who are important to me think that I should use Web 2.0 tools in workplace.
SN3	People whose opinions I value prefer that I should use Web 2.0 tools in workplace.
Behavioral Intention (BI)	
BI1	I intend to use Web 2.0 tools in workplace in the future.
BI2	I intend to use Web 2.0 tools in workplace as much as possible.
BI3	I intend to continue using Web 2.0 tools in workplace in the future.

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◈ 이 논문은 2011년 06월 23일 접수하여 2011년 09월 07일 게재확정되었습니다.