Exploring Determinants of Employees' Adoption of Enterprise 2.0 Applications: A Case of Enterprise Social Network

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Abstract

Nowadays, more and more organizations are implementing the use of emerging enterprise 2.0 applications consciously or unconsciously such as Blogs, Wikis, Social Networks, etc. However, as the end users, employee's attitude toward adoption of enterprise 2.0 applications still lacks theoretical support. On the other hand, many organizations which have implemented enterprise2.0 applications are confused about how to promote employees' use of enterprise 2.0 applications. The purpose of this study aims to provide a conceptual examination the determinants that affect employee's adoption of these enterprise2.0 applications using the revised UTAUT model. To test the model, structural equation modeling will be employed to analyze data collected from two organizations in which experimental tests of enterprise social network platforms are conducted. The findings of this research will show effective and reasonable ways of promoting employees' participations in an enterprise 2.0 environment so as to maximize the benefits generated from implementing enterprise 2.0 applications. This research will also provide a theoretical foundation for academics and practical implications for development of enterprise 2.0 applications.

Key Words : Enterprise 2.0 Applications, Adoption, UTAUT, Blog, Wikis, ESN

1. Introduction

It is commonly believed that as long as a

new emerging application is valuable, it will eventually be adopted by public. The word of "Enterprise 2.0" has emerged for the use of web 2.0 applications and technologies inside organizations. To fulfill the shortages of Enterprise 1.0 applications (namely Web 1.0 tools) and to provide more flexible participation as well as more effective interaction and collaboration between employees, the application of Blogs, Wikis, RSS and Enterprise Social Network (ESN) etc. in organizations has been started. The main characteristic of these Enterprise 2.0 applications is employees' active participation in the content of active participation, critical correlation, social presence, collaborative knowledge sharing. It is no doubt that enterprise 2.0 has significant advantages in knowledge work and collaboration compared to the previous generation of technologies.

Like other new things, since its emergence, enterprise 2.0 has long been controversial. Through years of continuous development, Eenterprise 2.0 is becoming more widely used to describe a collection of organizational and communication technology constructs that help organizations better engage their employees by enabling knowledge sharing, and community building. Web 2.0 technologies are not the same as Enterprise 2.0 since the business function of the later is substantial. By implementing enterprise 2.0 applications, the use of external and internal knowledge as well as internal communication processes on the whole are expected to be improved. In addition, organizations expect an increased cooperation of employees over and beyond departmental barriers and a better integration of the employees. Recently, there has been a dramatic proliferation in the number of Enterprise 2.0 applications. Due to the high potential benefits of using Enterprise 2.0 applications and technologies, an increasing amount of organizations are

also interested in using the innovative potential of enterprise 2.0 applications. For instance, to foster work collaboration, Motorola has more than 2600 internal blogs and 3200 internal wikis to foster knowledge sharing within the organization (Dearstyne, 2007).

However, employees' participations in the new enterprise 2.0 environments are still limited. Little theoretical literature is published about what motivates employees to adopt and participate in enterprise 2.0 applications. All of these reasons reinforce the urgency and importance of conduct this research. The following three research questions will be addressed in this study:

Research Question1: Are employees in organizations aware of the benefits of using Employee 2.0 applications to achieve an effective interaction and collaboration? Explain the possible utilization of enterprise 2.0 applications in organizations

Research Question2: Which technology acceptance model is suitable for predicting employees' behavior of enterprise 2.0 applications?

Research Question3: What factors best predict the drivers of employees' intentions to accept and engage in enterprise 2.0 applications?

The principal objective of this research seeks to validate a comprehensive model of employees' acceptance in the context of enterprise 2.0 applications. It uses the unified theory of acceptance and use of technology (UTAUT) model with constructs of technology features, knowledge sharing. Employee's responses to questions about attitude and intention to adopt enterprise 2.0 applications will be collected and analyzed. The research will take Korea as the site of the empirical investigation

because the supporting infrastructure required for enterprise 2.0 developments has been put in place. Korea has aggressively pursued the development of IT and networks and created a world-class IT infrastructure. It provides a solid foundation for application of enterprise 2.0 technologies in Korean companies. Meanwhile, Korea also has one of the highest per-capita usage statistics for Internet, all of these favorable conditions are conductive to the promotion of employees' participation in enterprise 2.0 applications.

In the next section, we will review the representative enterprise 2.0 applications that currently exist and examine prior research on issues of enterprise 2.0. In this section, possible benefits of utilization of enterprise 2.0 applications in organizations are also presented from the point of importance of employees' interaction. Section 3 develops an exploratory conceptual model of employees' adoption of enterprise 2.0 technologies based on the revised unified theory of acceptance and use of technology (UTAUT) 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 Enterprise 2.0 Applications

A plenty of applications have already existed in organizations such as, instant messaging (IM), e-mail, discussion forums etc, provided a communication between employees, however, they were lack of effective knowledge sharing, interaction and collaboration. McAfee categorized the information technologies that employees currently use into two categories: channels and platforms. Channels are easy tools for people to generate information but have low visibility to other employees, while platforms are applications where information is broadly visible but is typically generated by a smaller group of employees (McAfee 2006, Mike 2007). However, many employees aren't satisfied with the existing channels and platforms available to them (Davenport, 2005). The most fundamental problem is that current technologies aren't doing a good job of capturing knowledge throughout the companies. McAfee first use the term "enterprise 2.0" to focus on those platforms that focus on generating, sharing and refining information (McAfee, 2006). Enterprise 2.0 is a movement to bring web 2.0 applications (technological aspect) and culture (non-technological aspect) inside organization's intranets. Enterprises 2.0 technologies have their biggest impacts on knowledge work, innovation processes and cooperation among employees. All of these areas will benefit by the improvement and speeding up of processes (Frank et al. 2009). In this paper we mainly focus on technological aspect of enterprise 2.0 applications.

Above all, the business value of implementing enterprise 2.0 applications in organizations includes: 1. Quicker access to expertise and resources, enterprise 2.0 applications enable employees 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 employees 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 employees facilitates quicker engagement and more effective collaboration (Ross 2009). The most common tools of Enterprise 2.0 applications including Blogs, Wiki, and Enterprise Social Network which are discussed as follows:

2.1.1 Blogs

Blogs are social applications 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. Blogs have a variety of formats and might include the user expressing their opinion about a topic or documenting activities. Blogs are interactive in the sense that other users could provide comments on the information posted by the blog author. Blogs have grown in popularity. Thus, businesses and organizations are looking for ways to exploit blogs. Companies such as Nike and Paramount Picture also advertise through selected blogs as new way to reach potential customers. However, it takes much effort to start and maintain an active blog, which not only needs to update the content regularly, but also requires blog readers to visit and frequently interact with it. It is suggested that blogs encourage critical thinking with collaborative working, and provide feedback (Ajjan and Hartshorne, 2008).

2.1.2 Wikis

Wikis refer to collaborative websites that allow users to interact by adding, removing, or editing site content (Alexander, 2006). As wikis are free open source software, no one authorizes 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. 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).

2.1.3 Social Networking

Social networking is software that supports collaboration, knowledge sharing, interaction and communication of users from different places who come together with a common interest, need or goal. In recent years, social network services have expanded to provide services to millions of people all world-wide. Social networks are also known as range of applications that augments group interactions and shared spaces for collaboration, social connections, and aggregates information exchanges in a web-based environment. 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. The founders of each such application invite their colleagues to join in. Those who do, can continue, and ask their colleagues to join also. Slowly but surely these social networks enlarge (Levy, 2009).

2.2 Overview of Existing Technology Acceptance Models

A number of theoretical models and theories have been proposed to facilitate the understanding of diffusion and acceptance of information technologies or innovations. While some of them are grounded in social physiological context and focused on internal decision processes at individual level (Ajzen, 1991; Davis, 1989; Fishbein and Ajzen, 1975), others focused on features of innovation and focused on

diffusion of new technologies (Moore and Benbasat, 1991; Rogers, 2003). When studying in enterprise 2.0 applications context, it is necessary to consider employee's decision processes and features of innovation both. So it can be suggested that investigating adoption of enterprise 2.0 applications in the framework of Diffusion of Innovation Theory, Theory of Reasoned Action, Theory of Planned Behavior, Technology Acceptance Model I and II and Unified Theory of Acceptance and Use of Technology which would bring out more in depth and comprehensive approach (Rogers, 2003; Fishbein and Ajzen, 1975; Ajzen, 1991; Davis, 1989; Venkatesh and Davis, 2000; Venkatesh et al., 2003).

However, our study argues that the all of TAM, DIT, TRA and TPB may have only a limited ability to explain adoption of enterprise 2.0 applications, for several reasons. Most important, the TAM, DIT and TRA tend to neglect the social context in which a technology is being adopted, while TPB does not consider the influence of innovation feature in the adoption of new technologies (Malhotra and Galletta, 1999; Shin, 2009). This study employed the UTAUT model as the theoretical framework to understand employee's intention to use Enterprise 2.0 applications. UTAUT model is proposed by Vankatesh et al in 2003 by combining eight models in the previous documents to address the new framework for Unified Theory of Acceptance and Use of Technology (UTAUT). The eight models include Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behavior (TPB), CTAM-TPB, Model of PC utilization (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). after reviewing all constructs in the models, 7 constructs (effort expectancy, performance expectancy, social influence, facilitating conditions, attitude,

self efficacy and anxiety) were found significant direct determinants of intention or usage in one or more of the individual models, but when theorizing UTAUT only four of these constructs (performance expectancy, effort expectancy, social influence and facilitating conditions) taken into model. However the other 3 constructs, attitude, self efficacy and anxiety, were not found significantly influential. Beside the direct constructs, age, gender, experience and voluntariness of use were determined as significant moderators considered to be influential on main constructs. Finally, as result of the experimental studies, UTAUT was found for being able to be accounted for 70 percent of the variance in usage intention, a substantial improvement over any of the original eight models and their extensions (Venkatesh et. al, 2003).

3. Research model and hypotheses

3.1 Research Model Formation

Our research empirically examine, from the viewpoint of employees who are expected to be the direct user of enterprise 2.0 applications, the determinants that affect employee's adoption of enterprise2.0 applications using the unified theory of acceptance and use of technology (UTAUT) model. Nevertheless, the UTAUT model without revision cannot be applied directly to enterprise 2.0 acceptance studies since adoption factors of technologies may differ from emphasis points. It is our belief that some constructs are missing in the context of enterprise 2.0. Enterprise2.0 application in this study is a specific context that calls for additional constructs to be incorporated into the UTAUT model to better explain variances. Such as perceived security, should be taken into consideration when examining the adoption of enterprise 2.0 applications. This attempt is supported by

Shin (2009) who argued in their research that although enterprise 2.0 application has several benefits and potentials, it also has some disadvantages. There are increasing concerns about privacy issues, identity theft, and sexually explicit content. While useful information can be spread quickly, the same is true of negative or false information. They suggested that security, privacy issues fit well into the UTAUT domain (Shin, 2009).

Since enterprise 2.0 application is an act of information and knowledge sharing, a new form of socialization, we focused our investigation on four aspects: namely technology features, knowledge sharing, social influence and facilitating conditions.

3.1.1 Technology Feature Perspectives

Employee's perceptions about Enterprise 2.0 applications may be developed while they participate. To explain an employee's behavior, two influential beliefs: perceived usefulness and perceived ease of use were incorporated. Both of these influence the individual's attitude toward using an application, which, in turn, explains the individual's behavioral intention to use the application. Many studies have been aimed at finding the effect of additional factors that could influence behavior. In fact, research incorporating intrinsic motivation constructs, such as perceived security has been conducted. Therefore, usefulness, ease of use, and security were proposed as the factors that reflected the employee's participation in enterprise 2.0 applications.

3.1.2 Knowledge Sharing Perspectives

While knowledge sharing has been explored at the enterprise and task oriented level, enterprise 2.0 applications can be considered as the important ways of knowledge sharing. However, little effort has been devoted on investigating factors that affect employees' attitudes towards participation. Understanding such issues would not only expand the researchers' horizon in knowledge sharing, but also allow enterprise 2.0 application service providers to provide more effective strategies in managing successful Enterprise 2.0 applications.

In general, social psychologists considered that knowledge sharing motivation has two complementary aspects: egoistic and altruistic. The first was based on economic and social exchange theory. It includes economic rewards. The second, altruistic motive, assumes that an individual is willing to increase the welfare of others and has no expectation of any personal returns. Here, we omitted egoistic motives factor since participation behavior of enterprise 2.0 applications seems to be voluntary and with no economic rewards. Enterprise 2.0 application is a voluntary act of sharing among participants. Therefore, those with stronger altruistic motive will tend to be more willing to share knowledge. Furthermore, the role of employees' personality traits should also be considered as important variable of knowledge sharing. This attempt is supported by Wang and Yang's research. Wang and Yang (2005) extended the UTAUT to fit with their study, online stocking in the financial markets (Wang and Yang, 2005). Personality determines the unique thinking and behaving patterns of an individual (Allport, 1961). Eysenc (1991) proposed that personality traits contain five principles, namely replicability, comprehensiveness, external correlates, source traits and multiple levels. The five principles were then recognized as Five Factor Model (FFM) or Big Five Factors. FFM categorized personality traits into Extraversion (E), Conscientiousness (C), Agreeableness (A), Neuroticism (N) and Openness (O) (Eysenc 1991). Above all, to

develop factors of knowledge sharing, we mainly used factors such as personality traits and altruism.

3.1.3 Social Influence Perspectives

When employees participating into enterprise 2.0 applications, they expect others' feedback, Ellis and Fisher posited that roles and norms are common standards for group members' behavior. Role is the basic unit of socialization. When people participate in a social system, they identify with and assume a role in it. Empirical studies have also found that social norms positively affect an individual's behavior. In our study, social norm was defined as the degree to which a user perceived that others approved of their participating in the enterprise 2.0 applications. Thus we felt that the effect of subjective norm, image and social factors should be adopted as social influence in the context of enterprise 2.0 applications.

3.1.4 Facilitating Condition Perspectives

Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the application. Three constructs from earlier theories have attempted to measure facilitating conditions. Namely: perceived behavioral control, facilitating conditions and comparability.

3.1.5 Moderating Variables

The moderator "volutariness of use" in UTAUT model is dropped because of the specificity of enterprise 2.0 applications. There is no compulsory use in enterprise 2.0 environment. Althrough wikis and blogs start as blank pages, enterprise 2.0 technologies are not automatic and depend greatly on decisions made and actions taken by managers. Mandatory use imposed by managers here would not achieve promising results. By encouraging a few groups and individuals to start blogging and creating wiki pages with the hope that the content they generated would be compelling enough to draw people in could be an effective way. Furthermore, by posting notice implicitly telling people how to use the new tools is also a good way. Posting the agenda and action items for an upcoming meeting, suggesting that people use the wiki for their responses to them can also be widely used (McAfee, 2006).

The moderating variables of age and gender are also dropped in that the composition of employees in an organization is relatively fixed, it's not realistic to change the composition of employees so as to expanding the scope of enterprise 2.0 applications. Hence, analysis on gender and age will make no sense. Finally, our Research model is presented in Figure 1

3.2 Research Hypotheses

3.2.1 Technology Features (TF)

Technology features construct is defined as the degree to which an individual perceived that using an application or technology will be useful for his/her job performance, be convenient and secure to use etc. Three constructs from behavioral theories contribute to technology features. These include: perceived usefulness from TAM/TAM2 and CTAM/TPB, perceived ease of use from TAM/TAM2, and perceived security. Technology features of using enterprise 2.0 applications are defined as the extent to which employees believe that using Enterprise 2.0 applications will be effectiveness, secure and convenient. Past literature has found that technology features influence behavioral intention (Davis, 1989; Taylor & Todd, 1995). Therefore,
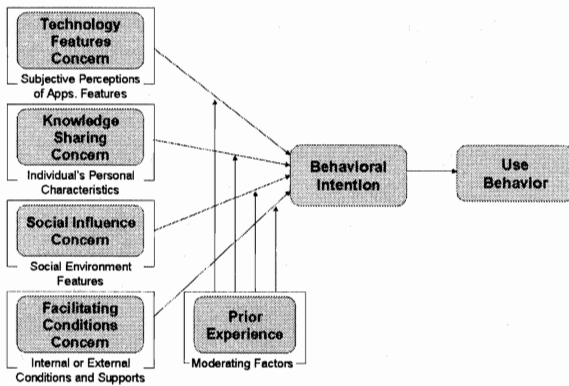
Figure 1. Research Model Based on Revised UATUT

H1. Technology features positively affects employees' behavioral intentions.
H1a. The influence of technology features on employees' behavioral intention will be moderated by prior experience.

3.2.2 Knowledge Sharing (KS)

Knowledge sharing construct is defined as the individual's personal characteristics associated with the sharing of knowledge when using an application. Two factors are proposed to determining knowledge sharing. These include: personality traits and altruism. The effect of knowledge sharing has been found to impact intention to use (Taylor & Todd, 1995). Thus

H2. Knowledge sharing positively affects employees' behavioral intentions.
H2a. The influence of knowledge sharing on employees' behavioral intention will be moderated by prior experience.

3.2.3 Social Influence (SI)

Social influence construct is defined as the degree to which an individual perceives that important others believe he or she should use the new system. Three constructs in from earlier theories have attempted to

measure social influence. These include: subjective norm from TRA, TAM2, TPB, and CTAM/TPB, social factors in MPCU, and image in IDT. Applied to employees' use of Enterprise 2.0 applications, Social Influence will reflect the employees' perception of whether their behavior is encouraged and accepted within their circle of influence. A positive relationship between Social influence and intention to use Enterprise 2.0 applications is hypothesized:

H3. Social influence positively affects employees' behavioral intentions.
H3a. The influence of social influence on employees' behavioral intention will be moderated by prior experience.

3.2.4 Facilitating Conditions (FC)

Facilitating conditions construct is defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system. Three constructs from earlier theories have attempted to measure facilitating conditions. They include: perceived behavioral control from TPB, CTAM/TPB, facilitating conditions from MPCU, and compatibility from IDT. Past literature has demonstrated that facilitating conditions is an important determinant of intention and use of technology (Taylor & Todd, 1995). Applied to enterprise 2.0, facilitating conditions reflects the employees' belief regarding the resources to perform the behavior. A positive relationship is hypothesized between facilitating conditions and intention to use enterprise 2.0 applications. Therefore,

H4. Facilitating conditions positively affects employees' behavioral intention
H4a. The influence of facilitating conditions on employees' behavioral intention will be moderated by prior experience.

3.2.5 Behavioral Intention (BI)

Consistent with the underlying theory for all of the intention models discussed in this paper, we expect that behavioral intention will have a significant influence on technology usage. Past studies have used behavioral intention to forecast specific behavior, given the close relationship between intention and behavior (Ajzen, 1991). A positive relationship between intention and actual behavior when it comes to using Enterprise 2.0 applications was expected.

H5. Behavioral intention positively affects employees' use behavior.

3.3 Measurement Items

Table 2. Measurement of Research Variables

Constructs	Research Variables	Definitions
Technology Features	Perceived Usefulness	The degree to which a person believes that using a particular system would enhance his or her job performance
	Perceived Ease of Use	The degree to which a person believes that using a system would be free of effort.
	Perceived Security	The degree to which a person believes that using a system would be free of risk
Knowledge Sharing	Personality Traits	The unique thinking and behaving patterns of an individual
	Altruism	The degree to which an individual is willing to increase the welfare of others and has no expectation of any personal returns
Social Influence	Subjective Norm	The person's perception that most people who are important to him think he should or should not perform the behavior in question.
	Social Factors	The individual's internalization of the reference group's subjective culture, and specific interpersonal agreements that the individual has made with others.
	Image	The degree to which use of an innovation is perceived to enhance one's image or status in one's social system.
Facilitating Conditions	Perceived Behavioral Control	Reflects perceptions of internal and external constraints on behavior and encompasses self-efficacy, resource facilitating conditions, and technology facilitating conditions.
	Facilitating Conditions	Objective factors in the environment that observers agree make an act easy to do, including the provision of computer support.
	Compatibility	The degree to which an innovation is perceived as being consistent with existing values, needs, and experiences of potential adopters.

4. Methodology

Measurement assessments are used to validate our model. Our study will conduct a three-stage procedure. The first stage is conducted through a review of the relevant literature and corresponding scales. In stage two, a set of sample items is generated for each construct and assessed for the reliability and content validity. In stage three, we will proceed with an extensive confirmatory analysis for enterprise 2.0 by testing and validating the refined scales for the reliability and construct validity. We will also verify convergent validity and the goodness-of-fit of my research model.

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