Information System Characteristics and Social Network Software Adoption

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ABSTRACT

Surfing the websites such as "My Space" and "Facebook" has become a prevalent phenomenon in the younger population. Nowadays, social network websites are the integral part of social, learning and working life for college students (Lampe et al., 2006; Murnan, 2006). The study of the nature of using social network software reflects essential practical and academic values.

The objective of this study is to examine the relationship between information systems characteristics and the adoption of social network software, based on the design theory of emergent knowledge process (Markus et al., 2002). The results of this study can contribute to the fields of information systems design and social network research.

Keywords: Social Network, Emergent Knowledge Processes, Social Network Software Adoption

INTRODUCTION

Information technologies have irrevocably changed the way people communicate. To the younger population, especially the age group of 18 to 23, e-mail has been treated as an old fashioned communication mechanism (Murnan, 2006). Increasingly, they have switched their communication platform to online social network sites such as Facebook and MySpace. Frequently, they log on to these web sites in order to keep in touch with friends or to browse the information of the new people they met in the offline communities. Statistically, the exposure to social network software is remarkably high. Based on a study from a sample of 1440 first-year college students, this survey revealed that 95% of college freshmen had heard of Facebook and 84% of them were Facebook

members (Lampe et al., 2006). As of year 2008, MySpace contains 110 million active users (Owyang, 2008) and Facebook owns more than 100 million active users and 6 million active user-groups (Facebook Statistics, 2008). Considering the availability of MySpace that started in 2003 and Facebook that started in 2004, people would amaze the velocity of adopting social network software.

A social network consists of a set of individual actors who interconnect through certain relationships, such as friendship, co-working or information exchange (Graton et al, 1997). Social networks are maintained through the interaction among members. In its traditional form of social network, members communicate through face-to-face conversation, phone call, or mail. As information technology advancing, online social network software provides a new mechanism that allows individuals to contact the people they know, and to access needed information sources. The new form of social network has overcome the time and space limits of the traditional network (Kavanaugh et al., 2005; Lea et al. 2006).

Due to its dynamic nature, an online social network always keeps participants and information contents evolving. An online social network has three emergent characteristics: (1) a network involves an unpredictable set of participants, (2) all members share unstructured information, and (3) all members have evolving information needs. These online social network characteristics highly resemble to the characteristics of emergent knowledge processes (EKPs). EKP design theory was proposed by Markus, et al. (2002) to study knowledge workers' information requirements for information systems that support emergent knowledge process.

Emergent knowledge processes are organizational activities that exhibit three characteristics in combination: (1) deliberations with no best structure or sequence, (2) knowledge requirements include both general and tacit knowledge distributed across experts and non-experts, and (3) highly unpredictable actor set in term of job role or prior knowledge (Markus, et al., 2002).

This study intends to examine the relationship of the information systems characteristics and social network application in the context of emergent knowledge processes. The measurements of the information characteristics (i.e., self-deploying, self-evolving, and action-ability) that have been developed in the previous research (i.e., Chou et al., 2006) will be used to predict the social network adoption. This project will test a causal model in order to better understand the relationship between the information system characteristics and the adoption of social network software.

ADOPTION OF SOCIAL NETWORK SOFTWARE

The formation of online social network is complicated and dynamic. Different factors such as membership, growth rate, and member's interest contribute to the structure of social network (Backstrom et al., 2006). According to the social network research, the relationships within a social network can be classified into "strong tie" and "weak tie" (Suarez, 2005). "Strong tie" associates with high frequency of interactions.

Usually, a social network with "strong tie" implies more reciprocal responsibilities among members. While "weak tie" implies that the members are loosely bounded to their main social network. Members in a "weak tie" social network are more likely to form new connections outside their main social network or bring in new members into the existing social network.

Social network theory has been applied to the information technology research to study the phenomenon of online communities. Some researchers suggested that information technology enables people to form many "weak ties" across different social groups and thus accumulating more "social capital" in term of information exchanging and social relationship building (Kavanaugh et al., 2005).

Within a social network, the members may form various communities to perform the functions of information provision, emotional support, material aid, and social identity (Wellman, 2005). The accessibility of online social network sites makes it easy for individuals who intend to join the online community. Popular social network sites such as Facebook, MySpace, and Twitter may accumulate their "social capital" through "weak ties" among their members. The existing members may continuously invite friends to join their communities, thus the existing social network can grow in term of size and richness of its information contents.

From the business strategy perspective, online social network has become an important strategic component in gaining competitive advantage (Cook, 2008). The users of online social network have become major content contributors to many business organizations. Those free contents provided by large number of volunteers may enhance business organizations' cost advantage. With hundreds of millions of people around the world sharing those contents created by the user community, the services and products information of various business organizations can be reached to a larger number of potential costumers than before.

From knowledge workers' perspective, recent technological development such as video conferencing, e-mail and mobile phones has reduced the need to work in office or cubicle. Now, it is possible for knowledge workers to work together while being spatially separated from one another. This type of virtual work environment can be characterized as a lack of physical proximity, in terms of workers and other organizational assets (Alexander 1997). Another description to virtual work environment is "a workplace without wall" (Finholt 1997). With the availability of the online social network software, employees in the virtual work environment have an evolving and scalable platform that can be utilized as a workplace tool for collaboration, sharing, and innovation (Lai & Turban 2008).

As more knowledge workers to be exposed to social network software, the attitude and working practice toward the technology use could be changed. The technology use has shifted from the centralized and specialized applications to distributed and flexible applications to provide multiple solutions (Dotsika & Patrick, 2006). Understanding the information system characteristics that influence social software

adoption can help system design professionals determine whether to incorporate social network functions in their system development projects.

RESEARCH MODEL AND HYPOTHESES DEVELOPMENT

Online social network involves unpredictable sets of participants who shares unstructured information and have evolving information needs. These characteristics show strong resemblance to the characteristics of emergent knowledge processes (EKPs) in knowledge management research area. This study intends to apply the design theory of emergent knowledge process (Markus et al., 2002) to the area of social network website's use, with an emphasis on the three information systems characteristics: self-deploying, self-evolving, and action-ability (Chou et al., 2006).

A research model of Social Network Software Adoption is shown in Figure 1. This research model depicts the relationships between the information systems characteristics and the social network software adoption.
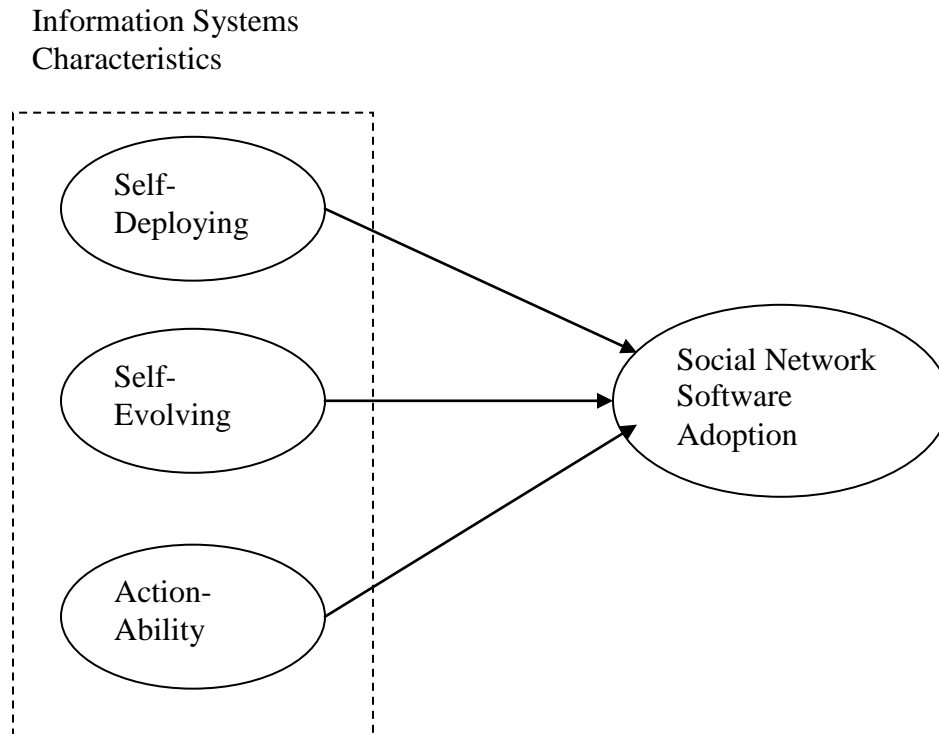

Figure 1: Research Model of Social Network Software Adoption

Information systems characteristics consist of three components: self-deploying, self-evolving, and action-ability. *Self-deploying* refers to the capability that a system can support different system-user interaction and engage users with different skill sets. *Self-Evolving* refers to the ability that a system can accommodate complex, distributed, and evolving knowledge-bases. *Action-ability* refers to the ability that a system can support an unstructured, dynamically changing process, so that users can act upon the knowledge

that system provides. *Social network software adoption* refers the patterns of social network software usage such as exchange ideas, coordinate task, and expand social contacts.

To most users, information technologies are simply the tools to get their work done. Most users have choices to use computer software to complete their tasks or not to use tools at all. Software with self-deploying characteristic can accommodate user skill sets regardless he/she is a novice or expert user. The perception that software can adapt users' skill level regardless they are novice or expert implies that users don't have to invest too much effort on using the software for their tasks. The research findings of technology acceptance model (Davis, 1989; Venkatesh and Davis, 2000) agreed that perceived ease of use leads to the intension of technology use. Literature also suggests that end users would more likely to adhere to the recommendation from a knowledge based system if the system provides the features to support both novice and expert users (Arnold et al., 2006). Thus, we infer that users perceive the self-deploying characteristic of computer software will be likely to adopt social network software.

> *H1:   The perception of self-deploying software characteristics facilitates the adoption of social network software.*

There are instances that users need to navigate through different information sources to find the information they need. The computer software with evolving ability enables users to use computer software to expand their information sources and to adapt to their evolving information needs. A system, which offers adaptive choices, allows users to enjoy using the systems in their own way to a degree that they may lose track of time and worries (Chen, 2007). Without the perception of evolving ability of computer software, users will be less likely to perceive that computer software can fulfill their information needs. Thus, we infer that users perceive the evolving ability of computer software will be likely to adopt social network software.

> *H2:   The perception of evolving-ability software characteristics facilitates the adoption of social network software.*

When users need to solve complex problems in a short time horizon and to improvise a solution, it is important that computer software the users use can help them take action onto their work. Computer software that is easy to be used to reconfigure and reformulate the problems should provide users the opportunity of experimenting innovative solutions. Computer software with high action ability may allow knowledge workers to tailor the software to fit their situated tasks. It is the software that adapts its users, as oppose to the users being required to adapt to the software. Thus, we infer that users perceive the action ability of computer software will be likely to adopt social network software.

> *H3:   The perception of action-ability software characteristics facilitates new work process innovations.*

RESEARCH METHODOLOGY

Data Collection

The research subjects of this study are the users of online social networks such as Face book, MySpace, or Twitter. The population of respondents is targeted at students in three selected colleges. An online survey has been conducted to collect the needed responses from the subjects. The statistical analyses will be conducted and their results will be reported at a later time.

Construct Validity Assessment

The scales of each construct will be assessed for reliability and discriminant validity. Reliability can be assessed with Cronbach's alpha (1951). Alpha value above 0.7 is considered acceptable (Nunnally, 1978). Discriminant validity can be assessed by estimating an alternative model in which the correlation between a pair of scales is set to 1. The difference of χ^2 values between the restricted model and free model provide the statistical evidence of discriminant validity (Segars, 1997).

Structural Model

To test the hypnotized research model, the method of structural equation modeling (LISREL) will be used to assess the model fit. Several statistics are used to assess structural model fit. Root mean square residual (RMSR) is a typical measure for model fit. It is an average of the residuals between observed and estimated input matrices. In order to represent a very good model fit, GFI, AGFI, and CFI value has to be 0.9 and above (Segars and Grover, 1993).

CONCLUSION

While moving into the knowledge society (Drucker, 1999), information technology becomes an important tool for knowledge workers to acquire, consume, and create knowledge. Younger population, especially college students, is the future knowledge workers of our society. Studying their behavior and attitude toward adopting online social network could generate interesting insights for the research fields of information systems and online social network.

This study intends to utilize EKP design theory as a foundation for examining the user information requirement in the domain of social network application. The objectives of this study are threefold: (1) applying EKP design theory in the context of online social network application; (2) developing the measurements of online social network software adoption patterns; and (3) understanding the relationship of the information systems characteristics and the adoption of social network websites. The results of this study will contribute to the literature in the fields of information systems design and social network. In addition to the academic outcomes, the results of this study may help understanding the potential benefits of using social network software in the classroom teaching.

The authors of this paper are currently collecting research data from targeted college students. The statistical analyses will be conducted and their results will be reported at a later date.

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