2006

Understanding Team Influence on Professionals' Acceptance of Large- Scale Systems

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Abstract

This paper highlights the importance of team influence in affecting professionals' acceptance of large-scale information systems. A longitudinal study involving 103 physicians was conducted with two data collections performed three months apart. The results show that team influence has a significant effect on perceived usefulness, but not on perceived ease of use, and that satisfaction with using the system of interest is significantly affected by team influence, but not by perceived usefulness. The findings make contributions to both research and practice of information systems.

Keyword: Team influence, TAM, Computerized Prescription Order Entry, Satisfaction

1. Introduction

The healthcare industry is investing heavily in information systems, particularly large-scale systems, expecting to enhance its service quality and performance (Menon et al. 2000; Davaraj and Kohli 2003). Yet, the expected benefits cannot be harvested unless these systems are assimilated and routinized. This turns out to be a difficult task due to two reasons. First, a large-scale system usually interrupts current workflows and requires individuals to adapt to the new systems (Davenport 1998). Second, professionals, including physicians, possess high authority and are highly autonomous in performing their tasks (Wallace 1995). This professionalism leads to fewer mechanisms available to hospitals to influence physicians' system acceptance than other industries (Ouchi 1979). Motivated by the lack of study on professionals' acceptance of large-scale systems, we conducted this research.

Technology acceptance model (TAM) has been widely used to explain individuals' technology acceptance behavior (Davis 1989; Davis et al. 1989; Venkatesh et al. 2004). In the context of large-scale systems, the relationships posited by TAM should still hold. That is, an individual who perceives the system as more useful and easier to use is more likely to use the system. Yet, due to the nature of large-scale information systems, the antecedents of user perceptions may differ from the traditional view arguing that user perceptions largely arise from objective technological characteristics. Drawing on social network theory (Fulk 1993; Schmitz and Fulk 1991), we contend that the users' work team, which is their proximal network, generates a strong influence on their perceived usefulness and perceived ease of use.

In addition to usage behavior, it is important to ensure professionals' satisfaction with using the system because satisfaction is found to be positively related to continuing technology use (Bhattacherjee 2001). In an organizational setting, an individual's satisfaction is not only determined by his or her personal experience of system use, but also, maybe to a greater extent, by the team environment in which he or she receives the consequences, both objective and emotional, of using the system. Therefore, we propose that team influence plays an important role in shaping professionals' satisfaction. To test our research model, we collected data with a large general hospital that adopted Computerized Priscription Order Entry (CPOE) system. Findings confirmed the

important role of team influence on physicians' acceptance of and satisfaction with this large-scale system.

The rest of the paper is organized as follows: We review the literature on technology acceptance, social influence, and team influence in the Theoretical Background section. Specific hypotheses are developed in the Hypothesis Development section. The Methodology section describes a longitudinal study and the results are presented in the Results section. We then discuss implications for research and practice, limitations, and future research in the Discussion section. The paper ends with a brief conclusion.

2. Theoretical Background

2.1 Technology Acceptance and Social Influence

Users' technology acceptance has received extensive attention from information systems (IS) researchers and practitioners in the last two decades. The extant literature suggests that user acceptance is critical for organizations to reap benefits from IT investments. Hence studying factors affecting user acceptance of technologies is of great significance (Agarwal 2000) and there is a voluminous body of studies on this topic (e.g., Agarwal and Prasad 1998; Agarwal et al. 2000; Compeau et al. 1999; Davis et al. 1992; Karahanna et al. 1999; Taylor and Todd 1995b; Thompson et al. 1991). User technology acceptance can be explained by a host of relevant factors such as user characteristics, technology characteristics, and organizational, social, and technical contexts.

Several theories have delineated user technology acceptance from a social cognitive perspective. Examples include diffusion of innovations theory (Rogers 1995b), theory of reasoned action (TRA) (Fishbein and Ajzen 1975), theory of planned behavior (TPB) (Ajzen, 1991), technology-task fit theory (Goodhue and Thompson 1995), diffusion/implementation model (Kwon and Zmud), technology acceptance model (TAM) and its extended model - unified technology acceptance and use of technology model (UTAUT) (Davis et al. 1989; Venkatesh et al. 2003). Of these theories, the main thrust is that an individual's cognitive perceptions about the outcome of using the target technology are developed after the individual processes information about the technology and its surrounding environments (e.g., Agarwal 2000; Davis 1989; Davis et al. 1989; Lewis et al. 2003; Venkatesh 1999). That is, the objective characteristics of the technology of interest and the organization where the technology is used cannot influence users' technology acceptance unless they are subjectively assessed by the users. The resulting subjective perceptions act as surrogates that users evaluate when deciding whether to accept the technology or not. Hence, social cognitive theories have gained much popularity in studying user technology acceptance.

Among all theories applied to explain user acceptance, TAM/UTAUT is probably the most influential in the IS literature. Drawing upon the theory of reasoned action (Ajzen 1991), TAM posits that an individual's intention to engage in post-adoptive behavior (i.e., individual intention to use the technology) is the best predictor of that individual's actual usage of the technology. Intention to use, in turn, is premised to be determined by two salient beliefs about the technology: perceived usefulness and perceived ease of use. A

number of studies have extended the original form of TAM by validating it in new contexts and extending it with new factors such as self-efficacy, job relevance, voluntariness, facilitating conditions, and social influence (Venkatesh et al. 2003), and thus have provided an enhanced understanding about user technology acceptance. Among the new factors added to TAM, social influence is particularly important because an individual is always embedded in a certain social context and his or her cognitions and perceptions are inevitably shaped, at least in part, by this social context. Hence, the role of social influence in the picture of user technology acceptance warrants scrutiny.

There are various conceptualizations of social influence in the IS literature. One dominant conceptualization, embedded in studies on adoption and diffusion of technologies, suggests that information conveyed via an individual's social networks influences his or her cognition about the target technology (Fulk 1993; Schmitz and Fulk 1991). Another conceptualization, applied in studies based on TRA and TPB, such as TAM research, defines social influence as "the degree to which an individual perceives that important others believe that he or she should use the system" (Venkatesh et al. 2003) (p. 451). In this paper, we adopt the first conceptualization. There are three mechanisms through which social influence affects individuals: compliance, internalization, and identification (Fulk 1993; Venkatesh 1999; Warshaw 1980). Compliance mechanism makes an individual change his or her intention in response to social influence; while internalization and identification mechanisms alter an individual's belief structure and thereby enhance the individual's motivation to accept the technology (Venkatesh 1999; Venkatesh et al. 2003).

Though there is substantial empirical support for social influence's effect on technology acceptance (e.g., Agarwal and Prasad 1998; Chau and Hu 2002; Davis 1989; Taylor and Todd 1995a; Taylor and Todd 1995b; Venkatesh 1999; Venkatesh and Morris 2000), it has not been applied to large-scale information systems which usually interrupt current organizational workflows and require collaboration among users. Different from simple technology, the adoption decision of large-scale systems has two stages – primary adoption and secondary adoption, i.e., the adoption decision is firstly made at the organization, division, or workgroup levels (primary adoption) (Fichman and Cronin 2003; Fichman and Kemerer 1997; Orlikowski 1993), followed by individual users' adoption (secondary adoption) (Leonard-Barton and Deschamps 1988a). It is common for large-scale systems to be successfully implemented but not successfully appropriated by users (Attewell 1992; Fichman and Cronin 2003; Markus and Tanis 2000; Robey et al. 2002). Managing individuals' technology adoption in the context of large-scale information systems becomes particularly important in view of the high costs and strategic importance of such systems (Beaudry and Pinsonneault 2005; Jasperson et al. 2005; Swanson and Ramiller 2004).

2.2 Physicians' Technology Acceptance and Team Influence

The healthcare industry is lagging behind other industries in terms of embracing IT. It is not until the last decade did hospitals start to invest heavily in IT, driven by the escalating healthcare costs (Menon et al. 2000). Issues related to the management of information systems in the healthcare industry have drawn increasing attention from IS researchers

(Chau and Hu 2002; Devaraj and Kohli 2003; Hu et al. 1999; Kohli and Kettinger 2004; Menon et al. 2000). Yet, the IS literature has a dearth of studies on physicians' acceptance of information systems, particularly large-scale information systems. A rare example is the studies on physicians' adoption of telemedicine, conducted by Chau and his associates (Chau and Hu 2002; Chau and Hu 2001; Hu et al. 1999).

One characteristic that distinguishes healthcare organizations from other organizations is the magnitude of professional autonomy of their employees, i.e., healthcare professionals usually possess high authority and are highly autonomous in performing their professional tasks (Wallace 1995). The high authority refers to the exclusive right of professionals to evaluate the competence of colleagues in executing professional tasks and activities and is reflected in the amount of authority that professionals have to participate in decision making and evaluate colleagues in their employing organizations. By contrast, high autonomy is the right of individuals to make independent decisions concerning the appropriate procedures for work tasks and activities (Tolbert and Stern 1991). In such an organizational context, it is difficult to influence or control professionals by explicit rules of bureaucracy, management authority or price mechanisms of markets (Ouchi 1979). Instead, clan control is an effective way to direct the purposive action of professionals to achieve organizational objectives (Sewell 1998).

Clan control is defined as an attempt to influence individuals by the common values, philosophy and approaches to problem solving within a clan (Kirsch 1996; Ouchi 1979). Because of goal congruence among clan members, there is no need for explicit incentives to motivate individuals (Kirsch et al. 2002). Instead, rituals and ceremonies are used to identify and reinforce acceptable behaviors among members of the clan (Kirsch 1996; Ouchi 1980). Research on clan control suggests that social influence within a clan plays an important role in rendering clan members to adopt a certain innovation. There is consistent empirical support for the effectiveness of clan control on professionals' acceptance of innovations in the healthcare industry (e.g., Ash 1997; Coleman et al. 1966).

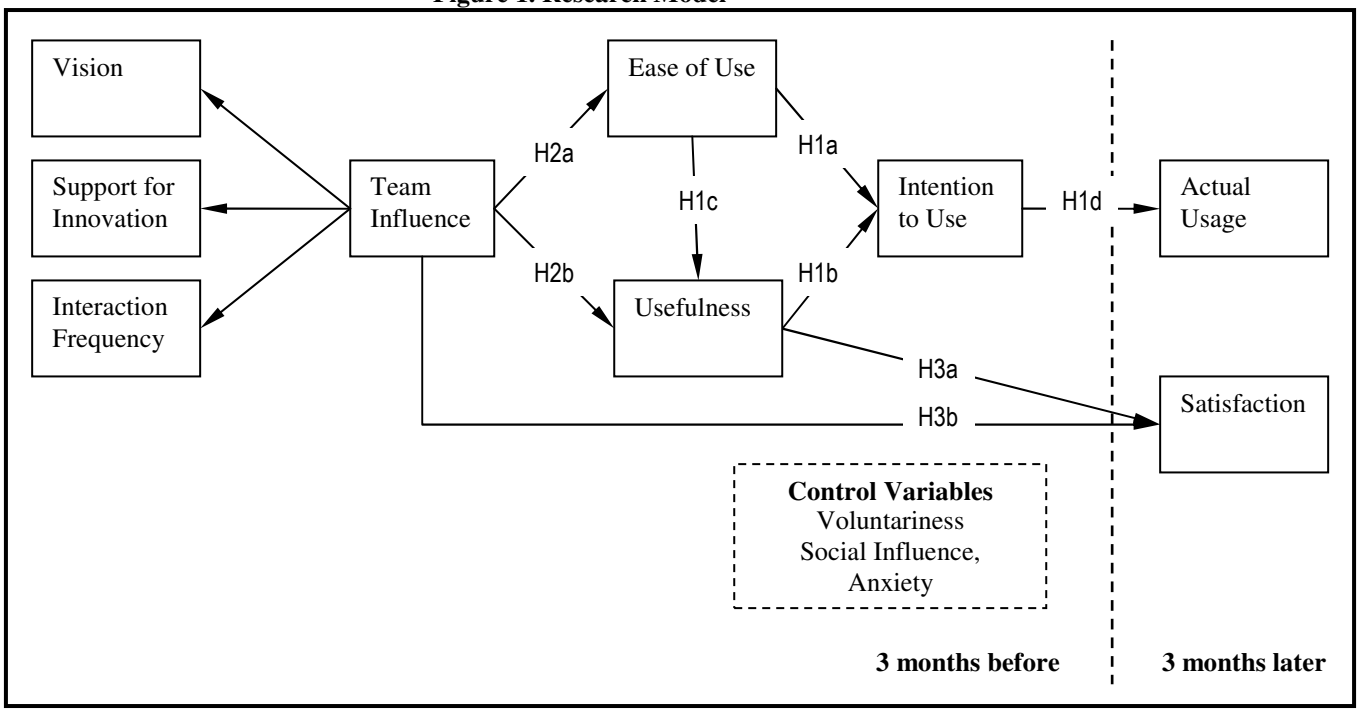
Clan control is effective essentially because it relies on the influence of professionals' social networks. The importance of social networks in endorsing and enabling the diffusion of innovations has also received considerable support from diffusion theories (Rogers 1995a; Van de Ven et al. 1999). Among various social networks, individuals are likely to identify most closely with their proximal work group (Fulk 1993). Proximal work group is defined as the permanent or semi-permanent team to which individuals are assigned, with which they interact regularly in order to perform work-related tasks (Anderson and West 1996). For healthcare professionals, the proximal work group represents the primary medium through which they acquire information about a technology of interest (Ash 1997). By processing and synthesizing information shared by their peers, individuals develop their cognitive structures about the target technology (Lewis et al. 2003). Therefore, great diffusion will occur in proximal groups that encourage within-team communications (Ash 1997).

Although teams can be an important catalyst for physicians' technology acceptance, this layer of the organizational structure is rarely examined explicitly, with most previous studies concentrating on either individual or organizational characteristics. Motivated by this inadequacy of the extant literature, we study the effects of clinical teams' social influence on physicians' acceptance of a large-scale information system.

3. Hypothesis Development

Figure 1 depicts our research model, which extends TAM by incorporating social influence originating from the team, which we coined *team influence*, as an antecedent. In particular, we propose that team influence is exerted through vision formulation, support for innovation and frequent interactions and has an impact on physicians' perceptions of the target technology. In addition, we study physicians' satisfaction with the target system as a dependent variable. We contend that physicians' perceived usefulness and team influence predict physicians' satisfaction over time.

Figure 1. Research Model



3.1 TAM Constructs and Relationships

The constructs and relationships in TAM have been discussed and empirically studied to an extensive extent (e.g., Agarwal and Prasad 1998; Chau and Hu 2002; Davis et al. 1992; Venkatesh 1999; Venkatesh and Morris 2000; Venkatesh et al. 2003). For the sake of conciseness, we provide a brief description here. Perceived ease of use is an individual's expectation about the effort needed to be expended to utilize the innovation, whereas perceived usefulness refers to the individual's subjective assessment of the utility offered by the innovation in a specific work-related context. According to TAM, an individual's intention to use is determined by perceived ease of use and perceived usefulness. In turn, intention to use is a predictor for the individual's actual usage of the

technology. Also, perceived ease of use has an indirect effect on intention to use mediated by perceived usefulness of the target technology. Therefore, we hypothesize that:

H1a: Physicians' perceived ease of use of the target system has a positive effect on their intention to use the system.
H1b: Physicians' perceived usefulness of the target system has a positive effect on their intention to use the system.
H1c: Physicians' perceived ease of use of the target system has a positive effect on their perceived usefulness.

While the relationship between intention to use and actual usage is widely accepted, it is rarely tested by a longitudinal study in the healthcare setting. We predict that the strength of intention to use will last over time and determines the actual usage behavior in the future.

H1d: Physicians' intention to use the target system has a positive effect on their actual usage of the system in the future.

3.2 Team Influence and Perceptions of the System

Team influence demonstrates itself in a process that involves an individual's cognitive processing of information embedded in his or her work team. While an individual's cognitive processes are subjective and retrospective, they are influenced by information provided by others (Bem 1972). According to Salancik and Pfeffer (1978), social context provides individuals with norms and expectations that affect the rationalization and justification activities. There are many forms of social information about technology. It can stem from interpretation of the adoption event, from norms of rationality or from others' statements that reflect their assessments of the target technology ((Fulk 1993; Salancik and Pfeffer 1978). Specifically, this paper studies the effects of vision formulation, support for innovation and communication within clinical teams, the proximal networks of physicians.

Vision is "an idea of a valued outcome which represents a higher order goal and a motivating force at work" ((West and Farr 1990) p. 310). A vision has four characteristics: clarity, visionary nature, attainability and sharedness (Anderson and West 1998). When a hospital adopts a large information system, physicians individually have their own interpretations of this adoption event, which may not be necessarily in favor of the adoption. A clear team vision, usually congruent with the organizational goals, helps to legitimize the adoption of the system at personal levels. In addition, a team vision supporting personal adoption of the system helps physicians perceive a valued outcome of personally adopting the system. By vision formulation within the team, physicians are likely to come to a shared belief about the usefulness of the target system. Hence, to the extent to which a team vision is congruent with the use of the system of interest, physicians tend to perceive the system as more useful.

Support for innovation is "the expectation, approval and practical support of attempts to introduce new and improved ways of doing things in the work environment" ((West and Farr 1990), p.38). Support for innovation affects physicians' perception of the target technology in three ways. First, the climate of support for innovation makes it legitimate to use an innovative technology at work. Second, physicians will perceive the system as more useful because they get to know more features of the system through fulfilling the team expectations that require them to use the system to execute clinical tasks. Perceived usefulness can also be enhanced because certain tasks can be accomplished by using the system in a supportive team environment. Finally, given that a large-scale information system often interrupts the current practices and workflows, physicians are inclined to find the system difficult to use. Support provided by the team helps them deal with these practical obstacles, thereby giving rise to an increased level of perceived ease of use.

Interaction frequency refers to how frequently team members interact with each other. Communication within the clinical team allows physicians to collect information on their peers' assessment of the target technology and to achieve a shared cognition (Fulk 1993; Schmitz and Fulk 1991). If peers view the target technology use as useful, an individual will tend to also believe that it is useful. Moreover, frequent interaction allows physicians to learn new ways of using the system and to finesse problems encountered during system use.

In summary, team influence affects physicians' perceptions of both usefulness and ease of use. Hence, we hypothesize that:

H2a: Team influence has a positive effect on physicians' perceived ease of use of the system.
H2b: Team influence has a positive effect on physicians' perceived usefulness of the system.

3.3 Satisfaction with the System

Satisfaction is defined as an individual's emotional state following IT usage experience (Boudreau and Seligman 2005). It is the extent to which the users believe that the target information system meets their requirements (Aiman-Smith and Green 2002; Simon et al. 1996; Watson et al. 1998). Recent empirical studies suggest that users' perceptions may change with time as users gain first-hand experience with the target technology. Dissatisfaction can lead to users' refusal to use the technology (Leonard-Barton and Deschamps 1988b). It is important to study user satisfaction because satisfaction ensures users' continuous usage, which is important for long-term benefits to accrue (Devaraj and Kohli 2003).

Perceived usefulness affects not only intention to use, but also satisfaction with the technology of interest. The logic is that if a user who finds a technology is useful at an early stage of using the technology is likely to find the technology useful over time. That is, the user's initial perception of the technology is confirmed by his or her experience of using the technology and such confirmation contributes to the ex post satisfaction (Bhattacherjee 2001). There is empirical evidence showing that perceived usefulness

leads to satisfaction (Bhattacherjee 2001; Bhattacherjee and Premkumar 2004). Therefore, we hypothesize:

H3a: Physicians' perceived usefulness has a positive effect on their satisfaction with the system.

Satisfaction is affected by team influence both directly and indirectly through perceived usefulness. First, as aforementioned, team influence affects perceived usefulness, which, in turn, affects satisfaction. This suggests that the effect of team influence on satisfaction is mediated by perceived usefulness. Second, team influence affects satisfaction directly through a social network channel. Drawing on social network theory (Fulk 1993; Schmitz and Fulk 1991), we contend that users' satisfaction, as an emotional state (Boudreau and Seligman 2005), is socially constructed within their proximal network.

A clinical team which has a clear vision, strong support for innovation and frequent interaction among peers allows physicians to acquire information about the content and functions of the target technology. First, the specific goals are clearly articulated, which makes users well aware of what to achieve and how to perform. This alleviates individuals' anxiety about the new system. Second, the climate of support for innovation provides a favorable environment and prepares users for changes brought with the target system. Third, the open communication among peers facilitates the coordination and cooperation required by the target technology of high interdependence. Frequent interaction also allows users to share both technical knowledge and emotional experiences in using the system. Overall, an appropriate team environment affords social approval and social support to using the target technology, making physicians feel that they are doing the right thing and they are doing things right. As a result, their satisfaction with the technology will be heightened. Therefore, we hypothesize that:

H3b: Team influence has a positive effect on physicians' satisfaction with the system.

3.4 Control Variables

Previous studies show that voluntariness, social influence, and anxiety may affect an individual's intention to use the target technology (Venkatesh and Davis 2000; Venkatesh et al. 2004). To partial out their effects, we include these constructs in the research model as control variables.

4. Methodology

4.1 Measurement Development

Most measurement scales of the principal constructs in our model were derived from prior studies. The scales we used for measuring vision, support for innovation, and interaction frequency within teams were originally developed by Anderson and West (1998). The scales for usefulness and ease of use were derived from the UTAUT (Venkatesh et al. 2004). We took three items of the usefulness scale from Venkatesh et al. (2004) that measure the general usefulness of CPOE and added two new items that capture the clinical usefulness of CPOE. We took all the items of the scale of ease of use

from Venkatesh et al. (2004). Regarding intention to use, two items were derived from Venkatesh and Davis (2000). We developed a new scale to measure usage from three aspects: using time, frequency, and intensity. To measure satisfaction, we used the scale developed by Bhattacherjee (2001). The scales for the three control variables were drawn from prior studies. The scale of voluntariness was from (Venkatesh and Davis 2000), whereas the scales of social influence, and anxiety were from (Venkatesh et al. 2004).

4.2 The Survey

We conducted a survey in a large general hospital in China, which had 429 physicians. The hospital implemented a CPOE system in its outpatient departments to allow its physicians enter prescriptions or lab orders into the system. We chose a Chinese hospital as the research site because physicians in Chinese hospitals have a more team-oriented work environment and are more likely to be acquiescent to team influence than their peers in Western countries. A single hospital was selected to ensure that the respondents are evaluating the same system when they take the survey. There is tradeoff between single site and multiple sites. Because different hospitals tend to customize CPOE systems to fit their organizational specifics, CPOE might stand for drastically different systems to physicians in different hospitals. If we select multiple hospitals, the system variability might introduce considerable random error to the data. Therefore, although multiple sites could make our findings more generalizable, we favor the single-site approach which provides more accuracy.

We first developed an English questionnaire, which was then translated into Chinese by an author. We hired a professional translator who knew nothing about our study to translate the Chinese questionnaire back to English. No semantic discrepancies were found when we compared the translated English questionnaire with the original English questionnaire, suggesting the Chinese questionnaire is equivalent to the original questionnaire.

The questionnaires were administered at the hospital's outpatient departments scheduled three months apart. At time 1, we asked the IT director of the hospital to distribute questionnaires to randomly selected 200 physicians. The questionnaires measured all the constructs except the two dependent variables: usage and satisfaction. A consent letter was attached at the beginning of the questionnaire to inform respondents that participating in this survey was totally voluntary and the data would be confidential and only used for research purposes. The physicians were requested to return the questionnaire in a sealed envelope to a designated mail box. At time 2, we asked the IT director to conduct the second round data collection. Questionnaires measuring usage and satisfaction were sent to all the physicians who responded to the first data collection. A total of 103 completed questionnaires were collected from physicians, showing a 51.5% response rate.

Non-response bias was assessed by verifying that (a) the respondent physicians' demographics (i.e. age, gender, and education) are similar to the Hospital's overall physicians' demographics as confirmed with the Hospital's human resources department, and (b) by verifying that early and late respondents were not significantly different

(Armstrong and Overton 1976). All t-test comparisons between the means of the early and late respondents showed no significant differences.

The average age of the respondents is 37.11 (SD = 8.08) and 68.4% of them are male. The majority of the physicians have at least a college degree (99%). Their average CPOE using experience is 3.90 (SD = 4.29) months. The respondents involve 20 different specialty departments, suggesting a reasonable representativeness of the entire hospital.

5. Data Analysis and Results

We used a component-based structural equation modeling (SEM) method, PLS (Chin 1998), for data analysis. A SEM approach allows us to evaluate relationships between independent and dependent variables at multiple levels and to assess measurement errors and structural relationships simultaneously. SEM is considered a better approach than regression analysis (Gefen et al. 2000). In addition, as a second generation SEM method, PLS is better suited for testing complex relationships as it avoids two serious problems of covariance-based SEM methods: inadmissible solutions and factor indeterminacy (Fornell and Bookstein 1982). Hence, we deem it appropriate to use PLS in this study.

5.1 Evaluating Measurements

Table 1. Factor Loadings

Construct	Item	Loading*	Standard Error
Usefulness	1	.84	.03
	2	.88	.03
	3	.89	.02
	4	.83	.04
	5	.78	.07
Ease of Use	1	.82	.04
	2	.88	.05
	3	.89	.05
	4	.93	.02
Social Influence	1	.74	.09
	2	.72	.11
	3	.87	.03
	4	.87	.04
Usage	1	.96	.01
	2	.97	.01
	3	.96	.01
Anxiety	1	.77	.22
	2	.72	.15
	3	.70	.24
	4	.70	.23
Satisfaction	1	.80	.06
	2	.88	.06
	3	.83	.09
	4	.84	.06
Voluntariness	1	.96	.01
	2	.82	.06
Vision	1	.92	.02
	2	.96	.01
	3	.95	.02
	4	.91	.02
	5	.94	.02
Support for Innovation	1	.89	.04
	2	.93	.03
	3	.95	.01
	4	.92	.02
Interaction Frequency	1	.93	.02

	2	.95	.01
	3	.95	.02
Intention to Use	1	.90	.06
	2	.96	.01

* All loadings are significant at 0.01

We evaluated convergent and discriminant validity and reliability of the measurement scales of the constructs. Table 1 shows that all the loadings of the measurement items are no less than .70 and significant at the .01 level, suggesting sufficient convergent validity. If the square root of a scale's AVE is greater than all of the inter-construct correlations, it is evidence of sufficient discriminant validity (Chin 1998). The results in Table 2 suggest that our measurement scales demonstrate sufficient discriminant validity. We also computed the composite reliability coefficients of the scales and found all of them exceeded Nunnally's (1978) recommended cut-off of 0.70.

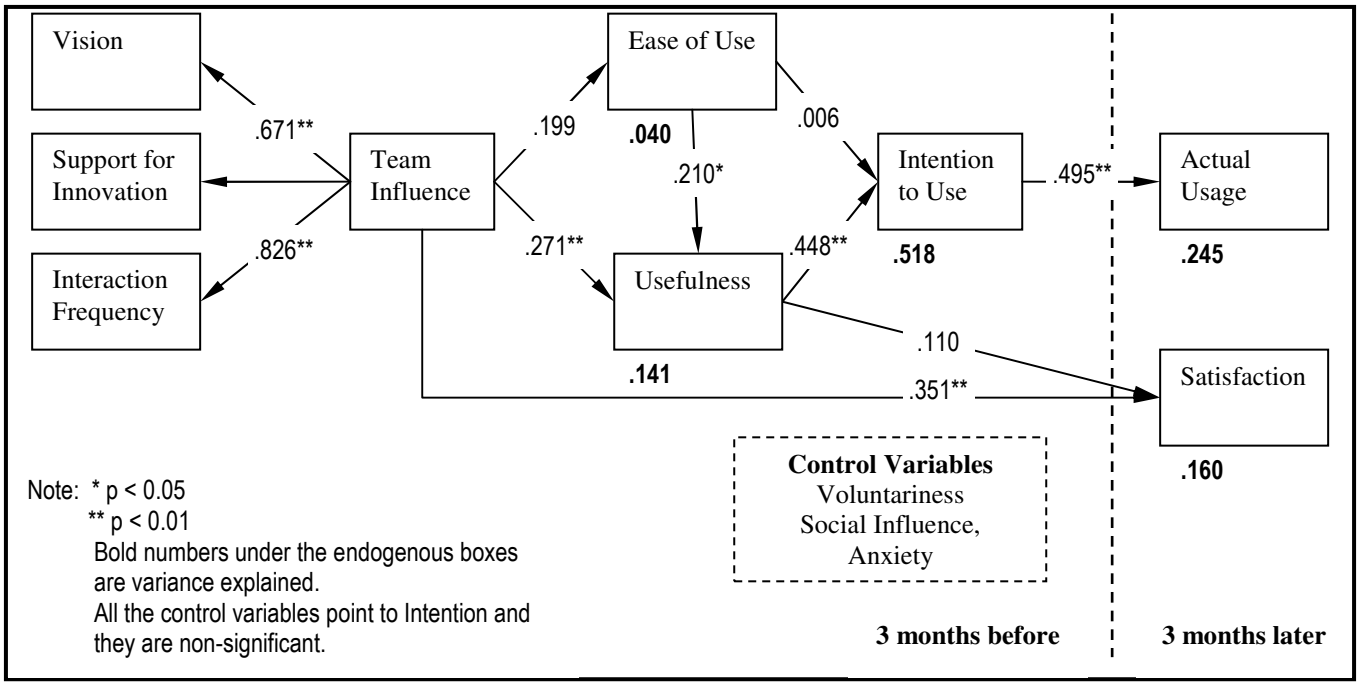
Table 2. Correlation Matrix

	Reliability	1	2	3	4	5	6	7	8	9	10	11	12
1. Usefulness	0.92	**0.66**											
2. Ease of Use	0.94	0.26	**0.78**										
3. Social Influence	0.88	0.60	0.50	**0.65**									
4. Team Influence	0.94	0.31	0.20	0.22	**0.56**								
5. Usage	0.98	0.60	0.24	0.49	0.20	**0.93**							
6. Anxiety	0.82	-0.40	-0.34	-0.29	-0.02	-0.23	**0.53**						
7. Satisfaction	0.90	0.22	0.52	0.26	0.39	0.14	-0.24	**0.70**					
8. Voluntariness	0.89	0.67	0.17	0.53	0.26	0.43	-0.26	0.10	**0.80**				
9. Vision	0.97	0.36	0.07	0.16	0.67	0.26	0.01	0.09	0.37	**0.88**			
10. Support	0.96	0.32	0.20	0.27	0.92	0.23	-0.07	0.37	0.26	0.48	**0.85**		
11. Interaction Freq.	0.96	0.05	0.17	0.05	0.83	0.01	0.05	0.42	0.01	0.31	0.68	**0.89**	
12. Intention	0.92	0.69	0.24	0.47	0.37	0.50	-0.33	0.32	0.58	0.34	0.36	0.15	**0.86**

Note: AVEs are on diagonal

5.2 Testing Hypotheses

Figure 2. PLS Test Results



The structural model testing results are shown in Figure 2. The reflective second-level construct, team influence, significantly determines its three first-level constructs: vision, support for innovation, and interaction frequency. The perceived ease of use → intention to use path is not significant, failing to support Hypothesis H1a. The perceived usefulness → intention to use path is significant, supporting Hypothesis H1b. The perceived ease of use → perceived usefulness path is significant, supporting Hypothesis H1c. The intention → usage path is significant, supporting Hypothesis H1d. The team influence → perceived ease of use is not significant, failing to support Hypothesis H2a. The team influence → perceived usefulness path is significant, supporting Hypothesis H2b. The usefulness → satisfaction path is not significant, failing to support Hypothesis H3a. The team influence → satisfaction path is significant, supporting Hypothesis H3b. None of the control variables has a significant relationship with intention to use.

6. Discussion

6.1 Implications for Research

This study makes several contributions to IS research. First, we investigate individual professional users' adoption of large-scale enterprise information systems. Previous research on technology acceptance largely focuses on less complex technology that primarily affects the user as an independent entity. By contrast, large-scale systems generate more profound impacts on business routines and processes of the entire organization. It requires the cooperation of groups of users to cope with the changes incurred by the use of these systems. This research angle affords us the potential to contribute to the technology adoption literature.

Second, drawing on social network theory, we stress the importance of team influence in shaping professional users' decisions to use the target technology. We find that team influence affects perceived usefulness, which affects intention to use, which, in turn,

affects actual usage behavior. We also find that team influence has a direct effect on satisfaction with the target technology. These findings confirm our research model and shed light on individual users' technology acceptance as shaped by their work teams.

Third, we conducted a longitudinal study in which independent and dependent variables are collected three months apart. The longitudinal nature eliminates the concern of common method bias (Podsakoff and Organ 1986) that undermines the validity of single-source, self-report studies. Our study provides substantial support to the widely accepted intention → usage relationship and the newly proposed team influence → satisfaction relationship.

Finally, but not least, we validated TAM in a new setting that involves healthcare professionals and large-scale information systems. While perceived usefulness is found to be a significant determinant of intention to use, perceived ease of use is not. This finding is consistent with a prior study on physicians' acceptance of telemedicine (Chau and Hu 2002; Chau and Hu 2001; Hu et al. 1999), suggesting that physicians are likely to differ from general IT users. This calls for particular attention to the application, and possibly modification, of TAM in healthcare settings.

6.2 *Implications for Practice*

This study provides insights regarding IT management in organizations. The importance of team influence in ensuring the continuing technology use is brought into spotlight. As the results demonstrate, team influence has an indirect effect on intention to use, which then positively leads to actual usage. More importantly, team influence has a direct impact on satisfaction with the technology. This is especially enlightening because satisfaction has been shown to be an important predictor of long-term technology use (Bhattacherjee 2001) that is critical to IT success in organizations. In contrast, perceived usefulness has no effect on satisfaction. Therefore, this study suggests that an IT-friendly team environment is important to the continuance of technology use. It would be misleading to unilaterally focus on educating individual users about the usefulness of the target technology. Instead, sufficient attention should be paid to cultivate the right team environment that supports the assimilation of information systems.

Team influence is especially important to the assimilation of large-scale enterprise systems which involves pre-designed work routines and business processes (so-called "best practices"). The embedded "best practices" might conflict with users' work routines and habits developed over years, thus making the adoption considerably challenging. In this case, team influence should be exploited to facilitate the adoption of enterprise systems at the individual level. Different from information systems for personal use, enterprise systems achieve its benefits through the integration and synergy of various components. It is difficult for individual users to realize such benefits from their personal standpoint. Team fills in the black between the organization and the user in terms of communicating about the benefits of enterprise systems. Hence, organizations should take full advantage of the influence that teams can provide to increase users' system adoption.

6.3 Limitations and Future Research

A limitation of this study is that the respondents are physicians from a Chinese hospital. We acknowledge that this is an inevitable limitation that troubles any survey-based research, because it is very difficult, if not impossible, to obtain a sample that could be claimed to be representative of the whole research population. This innate limitation also applies to studies that use American hospitals as their samples. Caution should be taken when generalizing our findings to the Western hospital settings. Future research should look into the effect of team influence in Western hospitals. Another limitation is that we modeled team influence as a second-level construct. While this approach helps keep the research model concise, it overlooks the effect of specific components of team influence on individuals' technology acceptance. Future research should examine the relationships between specific team influence components and other constructs relevant to technology acceptance.

7. Conclusion

This paper highlights the importance of team influence in affecting professionals' acceptance of large-scale information systems. The results show that team influence has a significant effect on perceived usefulness, but not on perceived ease of use, and that satisfaction with using the system of interest is significantly affected by team influence, but not by perceived usefulness. The findings make contributions to both research and practice of information systems.

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