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ABSTRACT

Instant messenger (IM), a communication technology originally used by individuals in their personal lives, has been increasingly adopted and used to facilitate work-related activities. Up to now, empirical research on IM use is still lacking. We conducted a qualitative study collecting interview data from a work group using IM for work purposes. We found that people have formed various patterns of IM adoption. Drawing on the theory of structure and agency, we explained that the adoption patterns are formed by both the group-level structures (peer pressure, social impact, managerial rules) and the individual-level agency factors (users' free choice based on their technology use history, age, and use habits).

Keywords

Technology adoptions, Technology use, Instant Messengers, Organizational Controls

INTRODUCTION

Instant messenger (IM) is a web or desktop application that enables users to indicate their presence and exchange real-time short messages. IM has its unique characteristics and its use differentiates from other communication technologies such as email and telephone. Major Internet service companies such as Google, Microsoft, Yahoo, and MSN all provide their applications of IM. In the beginning IM was used by individuals to contact friends and family. Recently, more organizations adopt IM at workplace and use it to facilitate collaborations between employees. The use of IM adds a new dimension to technology-mediated communications. Surprisingly, up to date, the publications about IM use especially IM use at workplace are very few. In order to fill this research gap, we conducted an exploratory study to investigate the adoption of IM at workplace. Specially, we intend to answer the following research questions.

1) Among the employees adopting IM at workplace, what are different adoption patterns?
2) What influence employees to form their adoption patterns?

The answers to these two research questions are important. First, for the organizations considering incorporating IM into their work places, the information about the employees' IM adoption patterns will support their decision making. Second, for the organizations having already adopted IM, knowledge about the actual adoption patterns will help them to efficiently and effectively to manage the employees' technology uses and manage the employees in general. In addition, the understandings on the factors forming the employees' IM adoption patterns will help the managers to further facilitate the employees' technology uses.

LITERATURE REVIEW

The Adoption of Instant Messengers for Work

All the major Internet service providers provide IM for free to their users. IM has its unique characteristics. The messages exchanged are text-based and sent in real-time. Other functions of IM include audio, video, and file transfer. The IM application has a small pop-up window for message writing. Usually IM users will leave the application on even when they

do not actively use it to exchange information. These unique characteristics make IM an ideal application for the users to show status and exchange quick messages. In the beginning, IM is a communication method used between individual Internet users. Soon, organizations started to incorporate IM as one of the communication channels. Jepson (2006) reported that a credit union in Illinois let the tellers to use enterprise instant messengers to ask the managers questions while serving the members. Instant messengers promoted multitasking and increased the efficiency of communications between the union employees. Kooser (2008) summarized the features of several enterprise version of IM including AOL Instant Messenger, Windows Live Messenger, Yahoo Messenger, and Google Talk. TelecomAsia.com reported a study on IM and summarized that 29% of people who use computer for work adopted IM at work and IM increased people's productivity because it allowed the users to flag their status (Telecomasia.net, 2008). Mamberto (2007) reported that Andrew McAfee, a Harvard professor stated that IM's feature of showing users' presence combined with other information technologies can change the way people collaborate so that people can "react to situations and problems on the fly, not solely by hierarchy." Shen and Gallivan (2006) reviewed academic research on the issue of IM use at workplaces. They categorized these literatures into three types, including how IM is used, why IM is used, and what consequences are associated with IM use. Shen and Gallivan (2006) called for more future empirical research to study the social factors affecting IM use at workplaces. We believe that our research answered their call by advancing theories and providing empirical data on the issues of IM use at workplaces.

The Lens of Technologies-in-Practice

Based on Giddens' structuration theory, Orlikowski (2000) proposed a practice len for studying technology in organizations. The prior models about technology uses based on the structuation theory stated that technologies have structures embedded by the IT designers at the stage of technology development. During the process of technology use, users will take human actions to appropriate the technologies and form different use patterns (DeSanctis and Poole 1994). Orlikowski (2000) further advanced the technologies and stated that technology is both a technological artifact, and a technology-in-practice. The former means that technology is a physical entity that has its own material and culture properties, and the latter means different technology use patterns formed by different users who repeatedly interact with the technologies under different circumstances. Orlikowski referred this theory as the lens of technologies in practice. On one aspect, we acknowledge that IM is a technology artifact that has its properties and design features. The material properties of IM are that it is a small program containing a window to show the user's buddy list, and a pop-up window to exchange messages; the cultural properties of IM is that people use it to show their status, keep it on even when not actively using it, and exchange text messages in the synchronous communication manner. However, our view toward IM use in this study is aligned with the lens of technologies-in-practice. That is, different people will form different patterns of IM use, depending on technological and social structures, and their experiences, assumptions, and interpretations of the technology.

RESEARCH METHODOLOGY

In order to answer the research questions we raised, we conducted a qualitative, interpretative study (Orlikowski and Baroudi, 1991). Our assumptions are that the process of technology use is socially constructed, and people's interpretations and perception of their experiences of technology use and researchers' interpretations are valid knowledge evidences. We primarily rely on qualitative data because qualitative data provides rich information about people's IM use and best fits the exploratory nature of the study.

Research Site

Our research site is 8-person workgroup within a large company. TechCo. is a large global company that provides information technology products and services worldwide. In order to attract and retain talents, TechCo heavily promotes telecommuting with its employees. TeleWork Program, a division in TechCo, works for supporting and promoting telework program for the company. Our research site, product development group (PDG), is a work group within TeleWork Program. PDG group designs and develops "products" to support the distributed work environment in TechCo. The products include real estate design, information technologies, and human resource work practices. There are currently eight people in the group, all based at home. The group director is located on the East coast. One group member lives in Arizona, and another in New Jersey. The rest of the group are located in the North California within the driving distance of the TechCo headquarter. The group meets face-to-face semi-annually, and meets electronically every other week. PDG constantly experiments with different information technologies that can support telework. Besides using phone and email to communicate, they are mandated by their manager to use an online calendar, video camera, and instant messenger during work.

Data Generation

We used qualitative interview as the primary data generation method (Mason, 2002). Choosing interviews as primary data sources best serves the research goal and agrees with the research methodology of this study. We intended to investigate and understand the adoption patterns of IM. People's interpretations, perceptions, meanings and understandings of their experiences with IM use are the major data we sought to collect. Although conducting observations to complement interview data sources would be ideal, it was not feasible in this case because the study participants were physically distributed. The interviews were conducted either on the phone or in person. Each interview was from 50 minutes to 2 hours. Each person was interviewed twice.

Data Analysis

We conducted analysis on the transcription of the interview data. We coded different IM uses. We coded the group-level factors that influence people's adoption of IM. We also compared each person's IM adoptions and his/her attitudes toward IM adoption. Then we compared the use patterns between individual users and categorize people who share similar use patterns together.

RESULTS

Group-level Rules on IM Use

The manager of PDG group set the rule that the employees log into the IM during the work time. Adopting instant messenger at work became one of the behavior standards.

> *"I don't require them to come to the office, I don't require them to punch a time card, but I do require on any working day, they are on their instant messenger. You put 'I am gonna be on vacation', or 'I am gonna be in a conference', 'I am traveling.'" Mack, PDG team director*

At the beginning, within the group people had different attitudes toward adoption of instant messengers. In order to make all people to conform to the standards, the manager constantly sent email to remind them to log into IM and he exercised "punishment" to people who violated this behavioral standards and refused to use IM. Gradually, almost all of the group members adopt IM. For people who did not follow the rules to use IM, the manger gave them verbal warnings. In addition, several people within the group told the story about one person who refused to use instant messenger and later got laid off.

Enthusiastic Adopters (EA)

Three people within the group are categorized as EA. The characteristics of EA are that they hold enthusiastic attitude toward IM use. They have already had experiences using IM in their personal life to communicate with friends and family. When the managers set the rule that the employees log into the IM every day, EA immediately embrace the idea with enthusiastism. Their enthusiasms also embodies in the aspect that they take initiatives to explore the technologies and engage in thinking about how to use IM in creative ways to solve their work related problems. They perceive that IM is a unique communication channel and is irreplaceable by other communication channels such as emails,

The following quotation comes from one of the EA, who passionately talked about the different ways of using IM to improve communications at work.

> *Diana, " IM does several things in my mind. It is a presence indicator. It is an absolute substitute for hallway conversation ...A post-it (note)---come-see-me-or-call-me sticker… It is the side-bar conversation during the meeting…"*

Regular Adopters (RA)

Regular adopters embrace the idea of using IM at work under social influence. Although they use the IM regularly, they do not take initiative to explore the creative ways to apply IM. However, they use IM according to the group norms. They deem using IM at work necessary but their attitude is neutral. When enthusiastic adopters experiment with different ways to apply IM to improve the communications and need regular users' participation, regular users will join the experiment and respond to enthusiastic adopters.

Seema, "A lot of the IM is 'hey, do you have a few minutes to talk?'…and sometimes during a meeting, we will have a quick message and saying, 'OK, meeting is not going well, sort of thing, we need to change topic.' Mostly it is a really quick three or four interaction messages… Anytime it is more three interactions for each person, I think we pick up the phone."

Peripheral Adopters (PA)

Peripheral adopters adopt IM in their work but they only use IM to a minimum degree. Their attitude toward IM was negative. They often deem that using IM in the work is not necessary. However, they still adopted IM because their manager mandated the adoption. They explained that some features of IM are distractive or "annoying" to them. In addition, they argued that the alternative technologies such as email could replace IM. They did not participate in the experiment initiated by the enthusiastic adopters. They would avoid using IM if possible.

Becky: "… when I am on IM, when I want to talk to them (co-workers), I might use it to say, 'hey, you are around, do you have a few minutes? I will give you a call'. If they are available I will pick up the phone, dial in, have the conversation instead of doing it on IM. It (logging into IM) is my compromise for them."

Non-Adopters

The last type of users is categorized as "non-adopters". The non-adopters refused to adopt IM in their work despite the rule of IM adoption. There are no non-adopters in the group at the time of the research. One previous employee was a non-adopter and was been laid off. The hostile attitude toward using IM is one of the factors that led to his layoff.

The information about IM uses and the ways that each adoption group adopts IM is summarized in table 1. The information about the characteristics of different adoption groups is summarized in table 1.

IM Use	Descriptions of IM Use	Enthusiastic Adopters	Regular Adopters	Peripheral Adopters
To substitute hallway conversations	To conduct non-work related casual talk or exchange work related information informally	X		
To conduct side-bar conversations during meetings	To talk with people attending the a meeting privately	X		
To use as a post-it	To leave a short message when the message receiver is away	X		
To stay on when the manager is in a meeting with the upper managers	To stay on the messenger and get ready to answer the manager's questions when the manager is in a teleconference with his upper managers.	X	X	
To show current status	To label the users' updated availability and work status	X	X	
To initiate message exchanges	To take initiative to exchange messages with co-workers	X	X	
To respond to the messages sent	To respond to the messages sent by co-workers	X	X	X

To log in	To log into the instant messenger during work time	X	X	X

Table 1: Summary of IM Uses by the Different Adoption Groups

Adoption Groups	Number of people	Descriptions of the Adoption Groups	Factors affecting IM use (or resistance to use)
Enthusiastic adopters (EA)	3	EA hold enthusiastic attitude toward IM use. They take initiative to adopt IM and use IM in creative ways. They perceive that IM has unique use purposes and cannot be replaced by other communication technologies.	Enthusiastic attitudes toward technologies. They think IM as a convenient, cool, and enjoyable technology.
Regular adopters (RA)	4	RA hold neutral attitude toward IM use. They follow the group rules, procedures and norms to adopt IM.	Work group rules and procedures; Social influence
Peripheral Adopters (PA)	2	Peripheral users only use IM at the minimum level. They perceive they adopt IM for other people.	Social influence; Preference to alternative technologies; Perceived negative effects of IM use
Non-adopters	None	Non-adopters refuse to use IM and do not provide justifications.	Negative feelings toward IM use for work

Table 2. Summary of IM Adoption Groups

DISCUSSION AND CONCLUSION

Following the lens of technologies-in-practice, we examined the adoption of IM for work purposes. We found that the rules and resources at the group level, such as the managerial control and group norms, have a strong influence for employees' adoption of instant messenger. In PDG group, the manager set using IM during work time a behavior standard and even exercise punishment to people who violated this behavior standard. Managerial control, which can be seen as a group-level structure, strongly affected people's behaviors of IM adoption. Almost all of the people in the group adopt this technology. The data showed that PDG group has adopted IM for work purposes as a group.

To summarize, we propose the following proposition (see figure 1)

P1: Group level structures such as managerial controls and group norms affect the adoption of instant messenger at the group-level.

Interestingly, although everybody adopted IM in PDG group, individuals' adoption patterns are different. The data showed three types of adopters, enthusiastic adopters, regular adopters, and peripheral adopters. The adopters' attitudes toward the adoption of IM, and the ways they applied IM to work-related communications varied to a large degree. Enthusiastic users had highly positive experiences with IM and they explored different ways to apply IM to improve their communications for work. Regular users had medium positive experience with IM and they accept the group norm and apply IM for certain purposes that they consider appropriate. Peripheral users had negative perceptions of IM and they only applied IM to a minimum level and tried to avoid IM use if they could. This showed that individual-level agency is an important factor that shape individuals' adoption use pattern. The data also showed that the agency is not without boundary. For example,

although peripheral adopters held negative attitudes toward IM, they still adopted IM at the restricted level because IM use is a behavior standard within the group. Therefore, the individual adoption patterns are shaped by both the group-level structures and the individual-level agencies.

To summarize, we propose the following proposition (see figure 1)

P2: Both group- level structures such as managerial controls and group norms, and the individual- level agencies, such as the individuals' perceptions of usefulness, ease of use, enjoyment, anxiety, and social influence related to IM use, shape the individual users' IM adoption patterns.

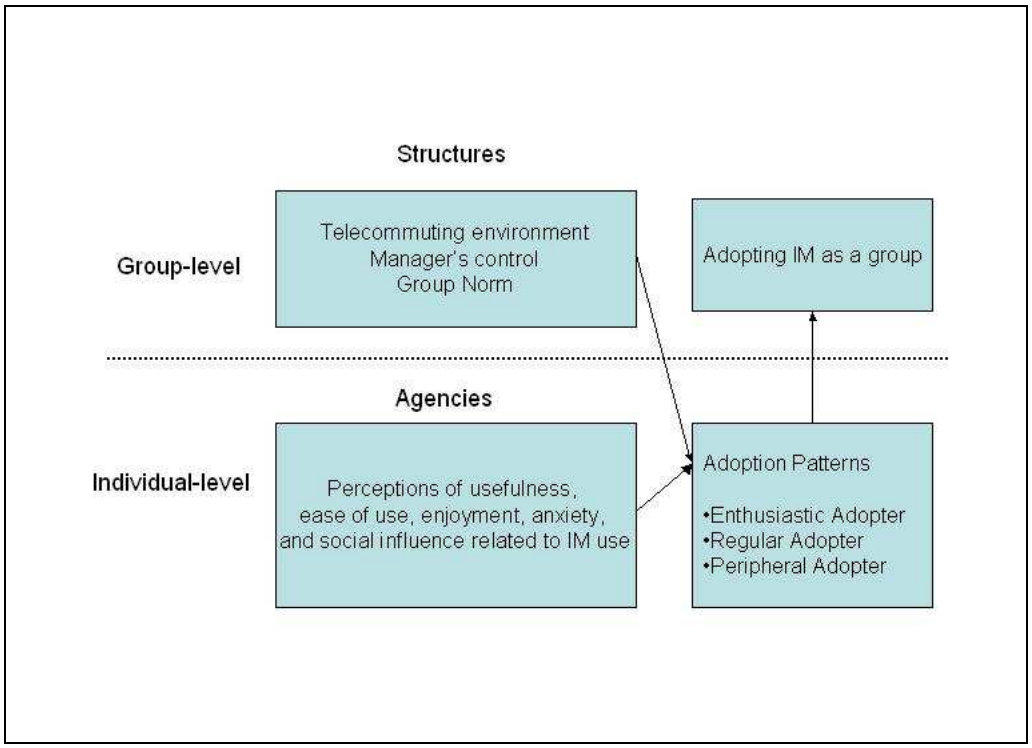

Figure 1: Theoretical model explaining the adoption of IM for work purposes

The results of this study have both contributions to research and implications to practice. In terms of research, first, we identified three different types of IM adopters, and for each type of adopters, we identified their use patterns. The research stream of IT adoption traditionally treats all the IT adopters uniformly, however, the individual adoption patterns are rarely homogenous. Therefore, empirical research that differentiates different levels of adoptions can further develop our understanding about the reality of the IT adoption. Second, we explained how group-level structures shape the adoption of IM at the group level and how group-level structure and individual-level agency together influence the adoption of IM at the individual-level. The results also have implications for practice. For managers who intend to adopt IM to improve employees' communications, the results of the study will inform them about the factors that will influence employees' IM adoption. For managers who manage the groups that have already adopted IM for work, the results will inform them that there exist heterogeneous adoption patterns. The managers can apply different strategies to manage IM use according to the characteristics of each adoption group. For example, the managers can collect innovative ways to apply IM from the enthusiastic adopters, and ask regular adopters to give trainings to the peripheral adopters about how to apply IM at work. T

The limitation of this research is that the research design is a cross-sectional, and thus it cannot capture the dynamics of the changes of the users' adoption patterns. For example, do the peripheral users get affected by the enthusiastic users and the

regular users and eventually adopt the IM at a higher degree, or do these peripheral users adopt the technology at the minimum level for a very long term? This question can only be answered by future longitudinal research.

There are several directions for future research. First, it will be interesting to explore the interactions and dynamics between different adoption groups. For example, do enthusiastic adopters influence peripheral adopters so that peripheral adopters will gradually raise their level of adoption? Do enthusiastic adopters and regular adopters feel frustrated because the peripheral adopters do not adopt IM at a high level? How do these interactions and dynamics between adoption groups affect the effect of communications? Second, we can compare the groups that have different composition of adoption groups. For example, how different is a group composed with only regular adopters from a group composed with all these three adoption groups? Hopefully more IS research will be conducted to further investigate IM adoptions for work purposes.

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