The Influence of Instant Messaging Usage Behavior on Organizational Communication Satisfaction

Shih-Ming Pi
Dept. Information Management
Chung Yuan Christian University, Taiwan
smpi@mis.cycu.edu.tw

Yi-Chih Liu
Dept. Information Management
Chung Yuan Christian University, Taiwan
joseph.chih@msa.hinet.net

Tsang-Yao Chen
Dept. Information Management
Chung Yuan Christian University, Taiwan
polochen@cycu.edu.tw

Shih-Hua Li
Dept. Information Management
National Central University, Taiwan
pvul3cj86@gmail.com

Abstract

In recent years, instant messaging (IM) has become a popular medium of online communication. While IM is expanding into the enterprise beyond personal use, it brings the convenience and also doubts. IM possesses the instant feature which is even faster than email so to potentially reduce the cost of communication and increase the effectiveness of communication; while the doubts being surrounding the employees' use of IM for personal chatting purpose which might reduce productivity. In the past, however, research on IM has been mostly on users such students or general Internet users with few addressing enterprise employees. This study focuses on enterprise organization and proposes a comprehensive model in which four aspects of social influence, perceived IM capability, computer self-efficacy, and task nonroutineness are integrated to explain the influence of IM usage in organization and to explore the relations between IM and organizational communication satisfaction. Three hundred and three valid samples employees from 15 companies across several industries are included in a survey and Partial Least Squares (PLS) is used to analyze the collected data to examine the IM-organizational communication satisfaction model proposed. The results provide several implications as following (1)social influence positively influences IM behavior; (2) perceived IM capacity positively influences IM behavior; (3) computer self-efficacy does not influence IM behavior; (4) task nonroiutineness positively influences IM behavior; (5) IM behavior positively influences an organization's formal communication satisfaction; (6) IM behavior positively influences an organization's informal communication satisfaction. It is hoped that the results would provide insights for organizational IM management.

1. Introduction

In recent years, use of Internet instant messaging (IM) has been in rapid growth. As a type of computer-mediated communication (CMC), IM has grown in popularity with its feature of being instant and rich in functionalities. According to a Gartner (2005) report, among the 53 million adult Internet users in the U.S., 24% use IM, which is even higher than emailing. It is worth noting that it took six years fro emailing to reach 50 million users while it took only two years for IM to reach the same user population size. IM usage is surpassing and gradually replacing the widely used communication media such as fax, phone, and e-mail to become a major communication tool. Radicanti Group (2004) also predicted that IM users is reaching a population of 1.44 billion in 2007 and that 85% of IM users in North America will use it for business communication.

In Taiwan, according to a survey by Insightxplorer (2006), 92.7% of the 15-40 years old Internet users in Taiwan have used instant messaging. An MIC (Market and Intelligence Center) (2006) survey also indicates that 76.3% of Internet users in Taiwan report that IM as the most often of Internet usage activities, followed by emailing and information search. In the meantime, in 2006, 27.0% of Taiwan companies have used instant messaging as a communication tool and the figure will increase 47% in three years. This means that in 2008, three quarters of Taiwan's enterprises will be using IM for communications. Obviously enterprise use of instant messaging is becoming a

1530-1605/08 $25.00 © 2008 IEEE

mainstream for personal and enterprise communication in Taiwan and around the world.

The implementation of a new communication media is not just a technical process, but also with major implication in terms of organizational communication. Thus, in the face of a new communication technologies, how enterprise managers choose and implement the media in support of organization communication to reach the organization's communication satisfaction becomes an important topic (Te'eni, 2001). Research in the choice and use of communication media also show that the use of communication media would affect organizational communication satisfaction and communication effects (Tsai, 2001; Liu, 2003). As IM for workplace is getting popularity, the introduction of it into the enterprise environment, just like any other new medium, presents a challenge to the existing communication framework.

While IM might bring effects into an organization very different from the traditional communication media in terms of communication behavior and communication effects, research on the use of instant messaging in enterprise setting is still in its embryonic stage. Related studies have focused on the analysis of general users of this emerging medium for technology acceptance. Very few research on workplace IM usage behavior has been done and the scale of study is relatively small with qualitative research approach and explorative in nature. Therefore, to explore instant messaging as an enterprise communication medium through a comprehensive research process larger scale to understand its influence in organizational communications has become the main research motivation of this study.

Based on the above background and motivation, this study seeks to understand the usage behavior of the employees within an organization, the impact of the use of instant messaging on the organization, and the interrelationship between the employees and the organization. Usage behavior refers to how the users' are using instant messaging in the organization including the effect of communicational satisfaction from the use of instant messaging. The research questions that guide are:

（1）What are the factors influencing the organization employees' use of IM?
（2）How is the communication satisfaction of the organization employees' who use of IM?
（3）What is the relationship between IM communication behavior and organizational communication satisfaction?

2. Theoretical Background

2.1 Media choice

Dov (2001) noted that the organizations communicate with media technologies is an interactive and cyclic process. The communication process involves input, forms of communication (including media and message), and the effects of communication. These factors form the recursive relationship among communication network, media perception, and media usage. There, the overall communication process is interactive. A change of any part of the communication process may cause the change in other parts of whole structure of communication and thus affects the communication process and its outcome. Research on new media such as IM therefore has much importance since its use might change the overall structure of the communication process that affect organizational communication. To study the new media therefore would help organizations understand the issue of the adoption, adaptation and expansion of and find the reasons for the success or failure of the new media (Rice et al., 1998).

Media choice theory is based on the rationality of choice that human being deal with stimulation through cognitive processing. Its basic proposition is that people recognize the basic qualities of communication media; people recognize the nature and purpose of communication activities; and that people have the ability to choose appropriate media in accordance with the characteristics of the media and the nature of the communications activities (Ku, 1999). Under that rational premise, research on media selection and use has two main approaches: First, the rational choice model that starts from the media characteristics and emphasizes the essence of media, rational choice, media and its communication tasks. The theory of media richness is the representative theory. Second, the social impact model which emphasizes the importance of social interaction and that that societal information will affect personal recognition, attitude, and rationalization on media characteristics and thus directly or indirectly affect the individual's choice of media (Fulk et al., 1990).

2.2 Social influence

According to Social Influence Model (SIM) (Fulk et al. , 1990), users' media use behavior of a medium is influenced by the social partners apart from the motive, media characteristics, and related tasks. For example, Fulk et al. (1995) showed that enterprise employee's use of email is influenced by coworkers and other employees' cognitive media evaluation; while the email cognitive evaluations from supervisors and coworkers is known as social influence. This study confirmed the positive relationship between the use of email and social influence. Lewis et al. (2003) also proposed that the value evaluation and use of information technologies in an organization, apart from personal factors such as computer self-efficacy, organizational commitment at the organization level, is influenced by social factors such as the direct supervisor, upper management, and colleagues in the same or different departments. Therefore, IM usage behavior, as a new communication technology, would be related to it's the same factors of social influence. Vries and Diana (2005) also pointed out that social influence is an important factor for the organization usage of phone, PDA, email and instant messaging and other Internet-media communication. Based on the literature reviewed, this study accordingly makes the following hypothesis :

H1: Social influence will positively influence the instant messaging usage behavior in the organization.

2.3 Perceived instant messaging capability

Daft and Lengel (1986) view task-related communication as a process of information exchange and processing, and argue that a communication action is initiated either to reduce information uncertainty by providing information or to clarify ambiguous issues and reduce information equivocally (multiple information explanations). Media capability is a combination and configuration of various features such as immediate feedback, multiple cues, language variety, interactivity, multiple addressability and editability. Hung（2006）shows that IM, as a highly synchronous communication medium, is not considered as effective for convergence communication such as online conferencing. However IM is perceived to be effective for project management purpose communications. As one gains communication experience with an IM partner, his or her perceived IM effectiveness for project management communication increases. Therefore, based on these literature review, this study accordingly makes the following hypothesis :

H2: Perceived instant messaging capability will positive influence the instant messaging usage behavior in the organization.

2.4 Computer self- efficacy

In recent years, experts and scholars in information management begin to look into social cognitive theory's application in information technology research. Compeau and Higgins (1995), in their self-efficacy research, advances the concept of self-efficacy to extend to computer self efficacy (Computer Self-Efficacy. CSE). Computer self-efficacy shows a person's ability to use computers, and is a criterion for what one could do with a computer in the future. Marakas et al. (1998) had a study on computer self-efficacy and divide the concept into Task-specific computer self-efficacy (SCSE) and General computer self-efficacy (GCSE). SCSE refers to when using of computers for certain areas, how the individuals feel they are able to display the work capacity. This is closer to Bandura's definition of self-efficacy for specific tasks instead of general computer capacity. In contrast, the definition of GCSE is the individual's overall computer capacity. According to Fulk's (1990) social implications mode (Social Influence Model, SIM), instant messaging is also a media usage experience of information and communication technologies. The cognitive abilities in the use of the media to communicate will thus affect the use of the media. Lewis (2003) indicates that, computer users' self-efficacy in the use of information communications technology is a significant personal factor. Taylor and Todd (1995) also indicates that computer users' self-efficacy on the use of computers positive effects on the usage of computers. Therefore, this study proposes the following hypothesis:

H3: Computer self- efficacy will positively influence the instant messaging usage behavior in the organization

2.5 Task Nonroutineness

Fulk (1990) and others raised the social implications mode (Social Influence Model, SIM) and suggest that task characteristics is a factor that affects the users' usage of the medium. Characteristics of the work is associated with several factors with task nonroutineness being the most commonly discussed among the variables. The concept came from Cambridge (1967) who

put forward tasks diversity (task variety) and the Treasury analysis of the task (task analyzability). Daft and Lengel's (1986) study indicated that, if the task's analyzability is lower with the lack of available steps and rules, then the higher the task diversity and the frequency of unexpected incident, and a large amount of information will be required. The users will then choose richer communication media as their communication tool. Majchrazk and others (2005) refer to non-routine tasks in their distributed team choice of media research, point out that when the team needs more information to deal with the ambiguity, the members are more likely to choose a information-rich media. Also, when a team often deals with non-routine matters, it will be more inclined to use a information-rich media. As IM software are able to deliver many types of information as other communication tools such as e-mail, BBS, this study makes the following hypothesis:

H4: Task Nonroutineness will positively influence the instant messaging usage behavior in the organization

2.6 Organizational communication satisfaction

Level (1959) defined communication satisfaction as the overall satisfaction of communication the employees perceived in the environment. Recognizing the importance of communication, scholars have been developing a variety of tools and questionnaires to study the process and effectiveness of organizational communication. Huang (1999) researched the employee satisfaction of email usage in the enterprises and found that members were generally satisfied with using email as a channel of communication. Tsai (2001) studied white collar workers in Taiwan's electronic information industry to explore the relationship among different communication media, staff communication satisfaction, and organizational commitment. The study found that communication satisfaction varied among different communication media. Liu (2003) indicate that mobile phone usage behavior within an enterprise has significant positive impact on organizational communication satisfaction.

Drawing from the above studies, use of communication medium could influence organizational satisfaction. Because of its unique characteristics of being real-time, rich in information carrying, and usefulness, IM communications might have different impact on the organizational communication from other studied media of communication. Thus the study makes the following hypotheses:

H5-1: Instant messaging usage behavior will positively influence the formal organizational communication satisfaction

H5-2: Instant messaging usage behavior will positively influence the informal organizational communication satisfaction

3. Research Methodology

This study attempts to investigate the relationship among the factors influencing IM usage in workplace, IM usage behavior, and communication satisfaction. According to the above literature review, social influence, perceived IM capability, computer self-efficacy, and task nonroutineness are the four variables which may affect IM usage in organization, with the usage behavior as mediating variables of organizational communication satisfaction. Accordingly, a model of this research is constructed as Figure 1.

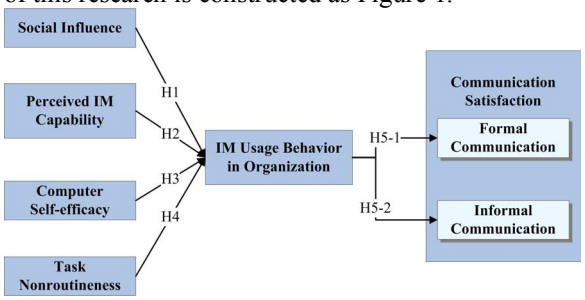


Figure 1. Research model

After developing the research model based on the literature review, a survey instrument was constructed. The multiple-item questionnaire contains questions in which each question is to be responded on a 7-point Likert scale from strongly disagree to strongly agree.

This study uses Grad and Laidlaw's (2004) CSQ scale as the basis and take references from Li (1999) and Tsai's (1996) development of the Chinese version of CSI Scale for the development of the IM Satisfaction Scale. Liu (2003) and Huang (2000) have studied communication media in domestic enterprises using the communication Satisfaction Scale developed by Li (1999) and others. However the studies are for overall communication satisfaction within organizations. This study therefore has to revise the questionnaire for use with IM with particular concerns on perceived communication satisfaction with formal and informal communication.

The initial version of the survey instrument was refined through extensive pretest with three researchers with significant expertise in the study of information management. The instrument was further pilot-tested with 32 enterprise employees in Taiwan. In total of 318 samples with 15 screened out for missing value, there are thus 303 effective samples. The hypotheses were tested using data collected from 15 companies across different industries that do not prohibit or require employees' use of instant messaging software. The data sets are analyzed using partial least squares (PLS). The unit of analysis is the individual employee in the companies.

4. Analysis and results

4.1 Samples

Table 1 shows the demographic information of the samples. A total of 303 useable responses were collected from 15 companies within a four-week period. 52.8% of the respondents are male and the largest group of users is in the age range of 26-30 (39.3%) and most are college degree holders (68%). A wide variety of IM systems are used in the organizations, including America Online Instant Messaging (AIM), ICQ, Yahoo! Messenger, Skype, and MSN/Windows Messenger. Among these systems, MSN/Windows Messenger is the most widely used. The respondents log on to use IM in the workplace with an average of 7.5 hours and use IM to communicate for average 2.5 hours.

4.2 Reliability and validity

Partial least squares (PLS) structural equation modeling technique is used for analyzing the research model. The examination of the results is done in two steps. The first step is to assess the reliability and validity of the measurement model. The second step is to assess the structural model itself. The sequence is used to ensure that the measures of constructs are reliable and valid before any attempt is made to draw conclusions about the nature of the relationships among the constructs (Hulland, 1999).

The measurement model in PLS is assessed by examining individual item's reliability, internal consistency, and discriminant validity. Item reliability is assessed by examining the loadings of the measures with their respective construct. Items with loadings of 0.7 or greater are desirable in that they share more variance with the construct than the amount of error variance (0.7 squared = 49 percent variance explained) (Barclay, Higgins & Thompson, 1995)

Table1： Demographic Information of Subjects

Question	Item	Samples	%
Gender	Male	143	47.2
	Female	160	52.8
Age	21 ~ 25	53	17.5
	26 ~ 30	119	39.3
	31 ~ 35	96	31.7
	36 ~ 40	25	8.3
	41 ~ 45	3	1.0
	Above 46	7	2.3
Education	High school	8	2.6
	University & college	206	68.0
	Graduate	89	29.4
Apartment	Market	29	14.8
	R&D	26	11
	Finance	15	6.4
	Sales	62	26.3
	Produce	9	3.8
	Information	54	22.9
	Human resource	6	2.5
	Others	35	12.3
Occupation	General staff	179	75.8
	entry level manager	38	16.1
	mid level manager	14	5.9
	manager	5	2.1
IM type	Yahoo! Messenger	4	1.7
	MSN Messenger	213	90.3
	Skype	16	6.8
	AOL	1	0.4
	Other	2	0.8

Question	mean	Std dev.
How many hours do you log on to IM per day in the workplace?	7.5	2.7
How many hours do you use IM to communicate for work per day?	2.5	2.16
How many times do you use IM to communicate for work per day (frequency)?	9.9	11.2

Internal consistency is assessed in a PLS model using composite reliability (CR) developed by Fornell & Larcker (1981) and discussed in detail by Barclay, Higgins, & Thompson (1995). The interpretation of Fornell & Larcker's consistency measure is similar to Cronbach's alpha in that a value of 0.7 suggests reasonable reliability (Nunnally, 1978).

Table 2: Reliability and validity of the constructs

Construct	CR	Cronbach's Alpha	AVE	Correlationship matrix and AVE1/2						
				1	2	3	4	5	6	7
1. Social Influence	0.917	0.887	0.651	0.807						
2. Perceived IM Capability	0.911	0.886	0.597	0.466	0.773					
3. Computer self-efficacy	0.961	0.955	0.714	0.304	0.594	0.845				
4. Task nonroutine-ness	0.911	0.869	0.719	0.246	0.246	0.299	0.845			
5. IM usage behavior	0.905	0.852	0.707	0.701	0.487	0.274	0.327	0.841		
6. Formal communication	0.953	0.938	0.771	0.644	0.620	0.319	0.303	0.732	0.878	
7. Informal communication	0.921	0.895	0.662	0.322	0.267	0.122	0.242	0.387	0.455	0.814

Discriminant validity is assessed in two ways in a PLS model. First, a cross-loading matrix is examined to ensure that no item loads higher on another construct than is does on the construct it measures. The second method assesses the shared variance among constructs. A construct should share more variance with it measures than it shares with other constructs in the model (Fornell & Larcker, 1981). A measure called average variance extracted (AVE) determines the average variance shared between a construct and its measures. If the square root of the AVE value is significantly greater than the correlation coefficients values, adequate discriminant validity is indicated (Barclay, Higgins and Thompson, 1995).

As shown in Table 2, the composite reliability values are in the range from 0.905 to 0.961, which is above the acceptable value. And the Cronbach's alpha values are in the range from 0.852 to 0.955, also indicating that the construct has adequate reliability. For average variance extracted (AVE) by measures, a score of 0.5 indicates its acceptable level. Table 2 shows that the variances extracted by measures are in the range from 0.597 to 0.771, which exceed the recommended value. Discriminant validity is also acceptable, as shown by the square root of the AVE being larger than any of the correlations among the constructs (see Table 2). Therefore, the psychometric properties of all constructs are satisfactory.

4.3 Hypothesis test

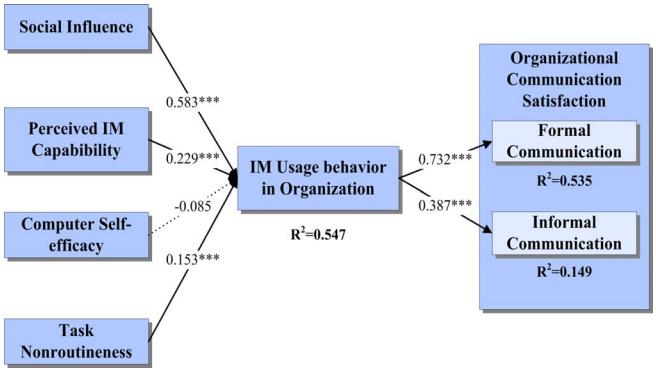
Once the measurement model in PLS is determined to be adequate, the explanatory and predictive power of the model can be assessed. The explanatory power of the model is examined by testing how well the observed data fit the hypothesized relationships among the constructs. This is done by examining the size, sign, and statistical significance of the path coefficient between constructs in the model. The statistics for the paths are generated using a bootstrapping technique. The predictive capacity of a PLS model is evaluated by examining the variance explained as R^2.

Figure 2 and Table 3 shows the results of the structural model in the research. As proposed in Hypotheses 1, social influence (β=0.579; t = 11.532; $p < 0.01$) is significantly related to the IM usage behavior in organization. The results show a significant positive relationship between social influence and IM usage behavior in organization, which supports Hypothesis 1. As proposed in Hypotheses 2, perceived IM capability (β=0.231; t = 3.704; $p < 0.01$) is significantly related to the IM usage behavior in organization. The results show a significant positive relationship between perceived IM capability and IM usage behavior in organization, which supports Hypothesis 2. As proposed in Hypotheses 3, computer self-efficacy (β=-0.091; t = -1.581) has significant effect on IM usage behavior in organization. The results show no positive relationship between computer self-

Table 3：Summary of path coefficients and significant levels

Hypotheses		Path coefficient	t-value	Support or not
H1	Social influence will positive influence the instant messaging usage behavior in the organization.	0.579	11.532	Support
H2	Perceived IM capability will positive influence the instant messaging usage behavior in the organization.	0.231	3.704	Support
H3	Computer self-efficacy will positive influence the instant messaging usage behavior in the organization.	-0.091	-1.581	Does not Support
H4	Task nonroutineness will positive influence the instant messaging usage behavior in the organization.	0.154	3.015	Support
H5-1	Instant messaging usage behavior will positive influence the formal organizational communication satisfaction	0.734	22.274	Support
H5-2	Instant messaging usage behavior will positive influence the informal formal organizational communication satisfaction	0.395	6.669	Support

efficacy and IM usage behavior in organization, which does not support Hypothesis 3. As proposed in Hypotheses 4, task nonroutineness (β=0.154; t = 3.015; $p < 0.01$) is significantly related to the IM usage behavior in organization. The results show a significant positive relationship between task nonroutineness and IM usage behavior in organization, which supports Hypothesis 4. As proposed in Hypotheses 5-1, IM usage behavior in organization (β=0.734; t = 22.274; $p < 0.01$) is significantly related to the formal communication satisfaction. The results show a significant positive relationship between IM usage behavior in organization and formal organizational communication satisfaction, which supports Hypothesis 5-1. As proposed in Hypotheses 5-2, IM usage behavior in organization (β=0.395; t = 6.669; $p < 0.01$) is significantly related to the informal communication satisfaction. The results show a significant positive relationship between IM usage behavior in organization and informal organizational communication satisfaction, which supports Hypothesis 5-2.



* shows that p-value < 0.1
** shows that p-value < 0.05
*** shows that p-value < 0.01

Figure 2. The result of research model

5. Conclusion

Instant messaging can effectively reduce the communication costs and improve the efficiency of communication in enterprise. This study is based on social influence model and relevant theories and models with "social influence," "perceived IM capability," "computer self-efficacy," and "task nonroutineness" as the impact factors of IM usage behavior within organizations

and the communication effectiveness by IM usage behavior in organization as the results. The study's conclusions are summarized as follows :

(1) Factors influencing the IM usage behavior in organization

The most important factor that influences the IM usage behavior in organization is "social influence." It shows that whether the employees would choose instant messaging as a tool for organizational communication is obviously affected by their colleagues. This is because the colleagues are the most often communication links at workplace. "Perceived IM capability" is the second important factor that influences IM usage in organization. The results show that the higher information richness the user perceives IM can transfer, the more the user will adopt it as a tool of communication. This is because instant messaging shows immediate, informative, and editability in support of organizational communication. Third, "computer self-efficacy" shows no relationship with IM usage behavior in this study. It may be that most of the employees surveyed have at least entry-level computer skills, and that the current IM applications all have user-friendly interfaces to use. Finally, in "task nonroutineness", it shows that the less the tasks are routine, the more information the employees need. Therefore, they will prefer to use such information-rich media such as instant messaging. This conclusion is confirmed with Majchrazk's (2005) research.

(2) The relationships between IM usage behavior and communication satisfaction in organization

Few researches have discussed the relationships between IM usage behavior and communication satisfaction in organization. The results of this study show that when organizations use IM as an official communication tool, the employees are more satisfied. This is a significant and positive conclusion to enterprises. It means that the enterprises could use IM for supporting organizational communication and the communication satisfaction would increase. On the other hand, however, this study also indicates that the IM usage behavior in organizations and "informal communication satisfaction" have a significantly positive correlation. It means that the employees may use IM to engage in non-official communications. For example, IM may be used to transmit internal rumors or personnel changes within the organization.

According to the conclusions, recommendations are made as follows:

(1) Instant messaging is suitable to meet the characteristics and needs of complexity communication environment and is suggested to be included as an official medium of communication, which will enhance the effectiveness and efficiency of organizational communication.

(2) When encouraging the use of IM for formal communication, positive attitude from the management and colleagues is important. This is because social influence is the most important factor to influence users' IM usage behavior in organization.

6. Reference

[1] Barclay, D., Higgins, C. and Thompson, R., "The partial least squares（PLS）approach to casual modeling: Personal computer adoption and use as an illustration, " Technology Studies, 2(2), 1995, pp. 285-309.

[2] Chin, W. W., "The Partial Least Squares Approach for Structural Equation Modeling," Modern Methods for Business Research, 1998, pp. 295-336.

[3] Chin, W. W., "Issues and opinion on structural equation modeling ," MIS Quarterly, 22(1), 1998, pp. 7-16.

[4] Chin, W. W. and Newsted, P. R., "Structural Equation Modeling Analysis with Small Samples Using Partial Least Squares ," Statistical Strategies for Small Sample Research, 1999,pp. 307-341.

[5] Daft, R. L. and Lengel, R. H., "Organizational Information Requirements, Media Richness and Structural Design ," Management Science, 32(5), 1986, pp. 554-571.

[6] Daft. R. L., and Lengel. R. H. "Message equivocality, media selection, and manager performance: Implications for information systems ," MIS Quarterly, 11, 1986, pp. 355-366.

[7] Donabedian, B., McKinnon, S. M. and Bruns, W. J., "Task Characteristics, managerial socialization, and media selection ," Management Communication Quarterly, 11(3), 1998, pp. 372-400.

[8] Te'eni, D., "Review: A Cognitive-Affective Model of Organizational Communication for Designing IT ," MIS Quarterly , 25(2), 2001, pp. 251-312.

[9] Fornell, C. and Larcker, D. F., "Structural equation models with unobservable variables

and measurement error ," Journal of Marketing Research, 18(1), 1981, pp. 39-50.

[10] Fulk J., "A Social Influence Model of Technology Use ," Organization and Communication Technology, Newbury CA, 1990, pp. 117-141

[11] Fulk, J., Schmitz, J. and Ryu, Dachee., "Cognitive Elements in the Social Construction of Communication Technology ," Management Communication Quarterly , 8(3), 1995, pp. 259-288.

[12] Grad, J. and Laidlaw, Heather., "Improve the measurement of communication satisfaction ," Management Communication Quarterly, 17(3), 2004, pp. 425-448.

[13] Hulland, J. S., "Use of partial least squares （PLS） in strategic management research: A review of four recent studies , " Strategic Management Journal, 20(2), 1999, pp. 195-204.

[14] Hung, Y. T., Kong, W. C., Chua, A. L. and Hull, C. E., "Reexamining Media Capacity Theories using Workplace Instant Messaging ," In Proceedings of the 34th Hawaii International Conference on System Sciences , 2006.

[15] Lewis, W., Agarwal, R. and Sambamurthy, V., "Sources of Influence on Beliefs About Information Technology Use:An Empirical Study of Knowledge Workers ," MIS Quarterly, 27(4), 2003, pp. 657-678

[16] Liu, S. T., A Research on Personal Mobile Phone Use Behavior and Communication Satisfaction – Using Marketing Sales as an Example," Unpublished Master's Thesis, National Sun Yet-sen University, 2003.

[17] Majchrzak, A., Malhotra, A. and John, R., "Perceived Individual Collaboration Know-How Development Through Information Technology-Enabled Contextualization: Evidence from Distributed Teams ," Information Systems Research, 16(1), 2005, pp. 9-27

[18] Nunnally, J. C., Psychometric theory, New York, McGraw Hill, 1978.

[19] Rice, R. E., "Task analyzability, use of new media, and effectiveness: A multi-site exploration of media richness ," Organization Science, 3(4), 1992, pp. 475-500.

[20] Tsai, S. M., "A Research on the Relationships between Communication Media, Employees Communication Satisfaction and Organizational Commitment in Business – An Empirical Study of Electronics and Information Industry in Taiwan," Unpublished Master's Thesis, Chang Jung Christian University, 2001.

[21] Vries, S. and Diana, I., "Implementation of networked organizational communication: A communication reference model ," Corporate Communications, 10(2), 2005, pp. 117-128.

[22] Webster, J. and Trevino, L. K., "Rational and social theories as complementary explanations of communication media choice: Two policy-capturing studies ," Academy of Management Journal, 38(6), 1995, pp. 1544-1572.