Groupware Technology Acceptance as a Knowledge Sharing Tool: A Case Study in UUM

Nor Farzana Abd Ghani[a], Mohd Syazwan Abdullah[b]

[a]*Graduate Department of Information Technology*
College of Arts and Sciences
06010 Universiti Utara Malaysia, Sintok, Kedah, Malaysia
Tel : 04-9284701, Fax : 04-9284753
E-mail : farzana@uum.edu.my

[b]*Graduate Department of Information Technology*
College of Arts and Sciences
06010 Universiti Utara Malaysia, Sintok, Kedah, Malaysia
Tel : 04-9284701, Fax : 04-9284753
E-mail : syazwan@uum.edu.my

ABSTRACT

This paper provides a richer understanding of the groupware technology acceptance by evaluating the use and the acceptance of Webcube in the Universiti Utara Malaysia (UUM), one of the Malaysian Public Universities. The focus is on Webcube's ten knowledge sharing features, which are Email, Homepage, News, Shoutbox, Journal, Calendar, Community Center, File Manager, Forum and Weblog. The research is based on the Technology Acceptance Model (TAM) framework – extended with the collaboration technology-specific determinants to the various TAM constructs. This paper discusses the factors influencing the use of Webcube and acceptance issues as highlighted by the users.

Keywords

Groupware, Knowledge Sharing, Technology Acceptance, Knowledge Sharing Technology

1.0 INTRODUCTION

In this information age, computer technology and worldwide networks make it possible for much knowledge and information to be transferred quickly. In most situations, all information needed by a person is available on line. Now, experts can transfer their knowledge using technology anytime, anywhere and anyhow.

Nevertheless, the important issue here is that how far KM applications or systems can support KM, bring positive impact to affect individuals' or organization's knowledge. As evidence in the case of Texaco as reported by (Westland & Clark, 2000), Lotus Notes, being the first generation of collaboration technology, turned out to be ineffective in improving collaboration and was used just for sending e-mail.

In view of this, it is important to evaluate the use of groupware technology, Webcube, which is widely used in UUM. The emphasis is on investigating whether the communities actually use the selected knowledge sharing features in the Webcube to share knowledge. This paper discusses the use and acceptance of the knowledge sharing features in Webcube and factors that influence the usage of knowledge sharing features in Webcube are presented as well.

The paper is organized as follows: Section 1.0 introduces the paper, Section 2.0 provides a background on Webcube, Section 3.0 discusses the research design and Section 4.0 then discusses the Webcube acceptance and use while Section 5.0 presents factors influencing Webcube use. Section 6.0 and 7.0 discuss the results and concludes the paper with direction for future research.

2.0 WEBCUBE BACKGROUND

The earlier version of Webcube was introduced back in 2001 with the purpose of providing an environment for information sharing and experience among the university community. This application was further enhanced with web based capability, whereby the users can access this application anytime and anywhere over the Internet. The most recent enhancement of Webcube was made in November, 2006, when the groupware's interface has been revamped to improve the user-friendliness of the application.

Nevertheless, the features offered by the Webcube are the same with the earlier version of Webcube. Looking at the number of enhancements made as of November 2006, the adaptation level of users to the new look of Webcube is not known. There might be possibilities that the users are still not familiar with the new look, thus hamper them to utilize the tool to share their knowledge.

Groupware technology success depends on mass usage and must have "appropriate individual benefit" for

individuals in the group (Brinck, 1998). Therefore, it is important to understand how such adaptation occurs before the university administration can begin to answer questions such as, "Does Webcube bring benefit to the whole University community in terms of promoting knowledge sharing in collaborative environment and is Webcube the useful tool to share knowledge amongst the university community?"

2.1 Knowledge Sharing (KS) Features in the Webcube

Webcube offers facilities like other typical groupware. Marwick (2001) believes that these technologies when combined serve significant purposes in Knowledge Management (KM) and play role in supporting KS in collaborative environment. Knowledge sharing is related to activities of sharing knowledge for example informing, translating and educating among employees (Marwick, 2001). This research focuses on ten knowledge sharing features identified in the Webcube, Email, Homepage, News, Shoutbox, Journal, Calendar, Community Center, File Manager, Forum and Weblog.

Table 1 briefly describes the functions served by each of these ten knowledge sharing features in supporting KM. The features available in the Webcube are similar to the features discussed by (Marwick, 2001; Brinck, 1998). Most of the features in the Webcube support sharing of explicit knowledge, instead of tacit knowledge. Reason being, Webcube does not offer features such as video conferencing, e-meetings and chat, which supports the sharing of tacit knowledge (Marwick, 2001; Brinck, 1998).

Table 1: The KM functions in the features

KS feature	Function for KM
Email	• To share explicit knowledge, pass, forward and filing messages
File Manager	• To share, manage and search collections of explicit knowledge
Homepage	• To share, search and view explicit/tacit knowledge. E.g. download audio/video/document from homepage
Journal	• To record, manage and share explicit knowledge
Weblog	• To share explicit knowledge • To allow other members to give comments/share explicit knowledge
Shoutbox	• To provide facility to post real time messages in a public space, similarly to chat system and newsgroup
Forum	• To share explicit knowledge "in response to a request for help" • To manage and search archive of the forum for useful knowledge
Community Center	• To allow group members to locate experts who is willing to share knowledge
News	• To share explicit knowledge in a public space instead of 1-to-1 communication • To provide current messages to user when they explicitly requested
Calendar	• To help locate, scheduling and coordination of experts

2.1.1 Knowledge Sharing Process of Webcube

Knowledge sharing involves collaboration of ideas among participants, team members. Therefore the groupware technologies dimensions discussed by (Brinck, 1998) can be used to explain the knowledge sharing features in Webcube. Groupware technologies are typically categorized along two primary dimensions; users of the groupware are working together at the same time ("real time" or "synchronous" groupware) or different times ("asynchronous" groupware), and whether users are working together in the same place ("collocated" or "face-to-face") or in different places ("non-collocated" or "distance") (Brinck, 1998).

The process of knowledge sharing of Webcube via its ten knowledge sharing feature can be explained by Table 2. There are four types of technique and that can be categorized as synchronous or asynchronous or combination of both. These techniques also highlight whether knowledge sharing could be done at the same time or different time. The ten knowledge sharing features fall under two categories only, namely Asynchronous/Different Time and Distributed Asynchronous/Different Time.

Table 2: The process of knowledge sharing of Webcube

Techniques Used	People Involvement
Synchronous (Same place) *None*	Same time
Asynchronous (Same place) • News • Shoutbox • Forum • Community Center	Different time
Distributed Synchronous (Different place) *None*	Different/same time
Distributed Asynchronous (Different place) • Email • File Manager • Calendars • Homepage • Weblog • Journal	Different time

3.0 RESEARCH DESIGN & STUDY SAMPLE

The research framework for this study was adopted from (Dennis, Venkatesh & Ramesh, 2003) and other constructs were taken from the literature. The framework also adopted other research works on the adaptation and adoption of groupware technology such as Chin & Gopal (1995) and Straub, Limayem & Karahanna (1995). The

adopted framework has extended the original TAM to incorporate a specific artifact of collaboration technology.

The sample for this study was from the university community, namely, academic and administration staffs, undergraduate and postgraduate students. A pilot test was conducted and subsequently, the questionnaires were distributed to the users and they were given between ten to fifteen days to respond.

A total of 810 of the survey were distributed in May 2007 in the campus, with the administration in selected departments/faculties in the university. Of the 810 questionnaires distributed, 533 (65.80%) are used for analysis. The majority of the respondents are undergraduate students (71.5%), followed by administrative staff (11.4%), academic staff (9.2%) and postgraduate students (7.9%).

Most of them age between 20-29 year old (84.1%), while the rest are between 30-39 year old (10.8%), 40-49 (4.7%) and 50 and above (0.4%). This is justified by a huge proportion of respondents are undergraduate students whose age is in their early 20s. Each of the role category samples; academic and administration staffs, undergraduate and postgraduate students are represented by between 2 to 4.5% from their respective population.

4.0 WEBCUBE ACCEPTANCE AND USE

The most important finding from this study is there are responses which indicated several significant numbers of reasons of not using the Webcube provided by the respondents. There are 52 respondents who contributed their reasons and they represented 78.8% from the population of users who responded not using Webcube to share knowledge.

Some of the issues might be insignificant, as the total of users who highlighted them was very small. However, the university should take some issues seriously, for example language barrier (3.8%) and lack of training/introductory course (3.8%). Because the intake of international students is increasing each year (Samiran, 2007), it is important to realize the importance of communicating in English or using standard Bahasa Malaysia in Webcube.

For example, the language used in Shoutbox is Bahasa Malaysia with a mix of local dialects, thus making it difficult for the international students to understand. Pertaining need of training, as shared by a few users, many of the new students need introduction to the Webcube during the orientation week, in order to get familiarize with the technology.

Another discovery that this study has made is that the users do not perceive sharing knowledge as useful (21.2%) and they refuse to spend free time using Webcube (21.2%). Specifically they revealed that they have no reason and not interested to use Webcube to share knowledge amongst other users. The majority of the respondents (32.7%) also revealed that they prefer to use other popular application available online and free, such as Yahoo Messenger and MSN Chat.

In addition to the above findings, this study also investigated in detail the popularity of knowledge sharing features amongst the community. According to the survey findings, the most popular feature is Email. This is supported by findings from the previous groupware studies (e.g. Chin & Gopal, 1995; Straub et al., 1995), whom suggested that Email is by far the most common groupware applications (besides the traditional telephone). Journal, Calendar, Community Center, File Manager, Forum and Weblog, on the other hand are among the least popular features. Surprisingly, more than 50% of the respondents, who use Webcube do not use these at all in a day.

According to other researches (e.g. Bradner, Kellogg & Erickson, 1999; Bos, Gergle, Olson & Olson, 2001; Geyer et al., 2000), many groupware systems implemented may not be successful unless a critical mass of users chooses to use the system. For example, having a videophone for forum is useless if only a few users are using it. One of the most common reasons cited for failing to achieve critical mass is lack of appropriate individual benefit by users.

The reason why other features are not popular can be associated with the findings from some of the reasons of not using Webcube in general. For example, as suggested by (Brinck, 1998), the concerns on privacy or other people not using the features may hamper the university community to use Calendar and Community Center extensively.

5.0 FACTORS INFLUENCING WEBCUBE USE

This study has adopted the approach used by other researches such as Venkatesh, Morris, Davis & Davis (2003) and Dennis, Venkatesh & Ramesh, (2003), which is to identify key factors within each characteristic. Other constructs taken from various literatures are consolidated with the specific factors adopted from the study by Dennis, Venkatesh & Ramesh (2003), to become the key factors for this study. The key factors are: Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude towards Using (ATU), Self-efficacy (SE), Familiarity with Others (FW), Mobility (MO), Social Presence (SP), Media Richness (MR), Immediacy (IM) and Concurrency (CN). These specific factors are believed to have significant impact on the use and acceptance of Webcube.

The factors which influenced the users to use the Webcube vary according to features. From the ranking of factors, Perceived Usefulness was the most influential factor to determine the usage for all the ten features and followed by other factors. This suggests that if the users

can understand the usefulness of a particular technology, then they may choose to use it.

Mobility was the least influential of all factors identified in this study as it has been ranked last in most features. Thus, it can be concluded that the requirement of users to be away from the office does not strongly influence the user to use the system. In fact, most of the community members actually spent most of their time in the campus. For example, students attend for lectures during weekdays and administrative staffs work in the office except for lunch hour. Therefore they do not perceive certain features for example Forum, File Manager and Weblog are necessary for them. The community can meet and share information everyday during any day of the week for students and office hour for staffs.

Like any typical government institution, the university community shares their knowledge primarily by attending face-to-face meetings, telephone conversations and so on. They indeed appreciate more of 'personal touch' and interaction with others when sharing their knowledge, which is also evident in the study by Geyer et al. (2000). For example they prefer to have a face-to-face meeting instead of using Forum to share ideas or come to agreement. Thus, they do not perceive Social Presence and Media Richness as amongst the strong influential to use the Webcube. Although most of the features are not being used extensively to share knowledge, nevertheless the community does use Email. Email is indeed by far the most common groupware applications, as demonstrated in the previous groupware studies (e.g. Chin & Gopal, 1995; Straub, Limayem & Karahanna, 1995) and also are proven in this study.

Other factors that were amongst the least influential are Self-Efficacy and Concurrency. Both Self-Efficacy and Concurrency require users to be confident, need less assistance and competent when using the technology. However, this is not the case because most of the users do not have much experience and enough exposure to use Webcube. Instead they choose to use other popular and familiar application available on the Internet. Reasons why they do not use Webcube is proven from users' response, which were lack of introductory course, lack of familiarity and the existence of popular application/tool.

6.0 RESULT DISCUSSION

The results presented for every feature were consistent with prior literature on TAM constructs. They provided additional evidence regarding the usage of these constructs to other types of technology. In this study, it was found that attitude was insignificant in all features in the Webcube when Perceived Usefulness and Perceived Ease of Use were included as predictors. This follow the same pattern as previous TAM and technology adoption researches (e.g. Davis,, Bagozzi & Warshaw, 1989; Venkatesh & Davis, 2000; Venkatesh, Morris, Davis & Davis, 2003). Therefore, based from the result, the theorization made by (Dennis, Venkatesh & Ramesh, 2003) that effectiveness (usefulness), efficiency (ease of use) and attitude (satisfaction) will jointly determine collaboration technology use in general is not applicable in studying groupware technology in an academic environment.

This study has extended the application of the constructs and as well as others in the context of groupware technology usage in organization. Thus, the current work contributed to research in the domain of groupware technology and collaboration technology generally. The study successfully discovered some reasons why users are not using Webcube. These issues are worth to be considered by the management of the university in order to improve the level of Webcube usage in the future

Each of the knowledge sharing features in the Webcube has their own unique predictors and power of influencing their usage. Thus, as theories become more focused on specific IT artifacts and fine distinction of such technologies, their generalizability becomes limited, even though it is more applicable to the specific class of technology under investigation. These results highlight the need to use standard and context-specific characteristics in technology adoption studies.

7.0 CONCLUSION AND FUTURE WORK

This study has successfully identified various factors affecting the use and acceptance of ten knowledge sharing features in the Webcube. The model used integrated TAM constructs with existing and new constructs, drawn from media choice theories, applicable to the general class of collaboration technologies.

The lack of usage by the users to use Webcube to share their knowledge need to be studied as many groupware systems simply cannot be successful unless a critical mass of users chooses to use the system. The results from this study have several important implications for research on collaboration technology use and groupware technology use for sharing knowledge in particular. This study provides direction for future studies in this critical area.

There exists some limitation in this study which is on how the data were collected. The future work in this area should overcome this limitation. Although data for this study were gathered from a real-world sample, the possibility of selection bias cannot be neglected. Future research is necessary to identify other potential constructs. Further work is also necessary to identify other appropriate variables which are applicable to local context (Malaysia). It will be important to examine the generalizability of this finding of general groupware technology use to other setting while being sensitive to specific organizational context variables.

REFERENCES

Bos, N. D., Gergle, D., Olson, J. S. & Olson, G. M. (2001). *Being There Versus Seeing There: Trust Via Video*. presented at CHI 2001.

Bradner, E., Kellogg, W. A. & Erickson, T. (1999). *The Adoption and Use of 'Babble': A Field Study of Chat in the Workplace*. Presented at Sixth European Conference on Computer Supported Cooperative Work, Copenhagen.

Brinck, T. (1998). *Usability First: Groupware: Applications.* Retrieved 3 May 2007, from www.usabilityfirst.com/groupware.

Chin, W. W. & Gopal, A. (1995). Adoption Intention in GSS: Relative Importance of Beliefs. *Database, vol. 26*, pp. 42-64.

Davis, F. D., Bagozzi, R. P. & Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models," *Management Science, vol. 35*, pp. 982-1002.

Dennis, A. R., Venkatesh, V. & Ramesh, V. (2003). *Adoption of Collaboration Technologies: Integrating Technology Acceptance and Collaboration Technologies Research*. Retrieved 3 Mac 2007, from www.indiana.edu/~isdept/research.

Geyer, W., Daijavad, S., Frauenhofer, T., Richter, H., Truong, K., Fuchs, L. & Poltrock, S. (2000). *Virtual Meeting Support in TeamSpace.* presented at ACM Conference on Computer-Supported Cooperative Work, Philadelphia, PA.

Marwick, A. D. (2001). Knowledge Management Technology. *IBM Systems Journal, 40*, pp. 814-830.

Samiran, M. F. (2007). Statistics for the Number of Students and Staff in UUM. Personal Communication.

Schreiber, G., Akkermans, H., Anjewierden, A., de Hoog, R., Shadbolt, N., de Velde, W. V. & Wielinga, B. (1999). *Knowledge Engineering and Management: The CommonKADS Methodology*. MIT Press.

Straub, D., Limayem, M. & Karahanna, E. (1995). Measuring System Usage: Implications for IS Theory Testing. *Management Science, vol. 41*, pp. 1328-1342.

Venkatesh, V. & Davis, F. D. (2000). A Theoritical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies," *Management Science*, vol. 46, pp. 425-454.

Venkatesh, V., Morris, M. G., Davis, G. B. & Davis, F. D. (2003). User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly, vol. 27*, pp. 425-454.

Westland, J. C., & Clark, T. H. K. (2000). *Global Electronic Commerce: Theory and Case Studies*. Cambridge, MA: MIT Press.