

ONLINE COMMUNICATION SATISFACTION TOWARDS THE USE OF INTERNET-BASED INFORMATION MANAGEMENT SYSTEMS: A STUDY AT FOUR RESEARCH UNIVERSITIES IN MALAYSIA

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Abstract

Information and communication technology (ICT) now provides the means for more interactive and collaborative forms of participation in organizations. The growth of the Internet and Web 2.0 has led to a rapid development of online systems in organizations, where often the first domain to be designed has the priority aim of enhancing organizational communications processes within the area of staff interaction. Adapting the communication satisfaction and Technology Acceptance Model (TAM), the study examines online communication satisfaction in using an Internet-based information management systems (IBIMS). Its findings on the effect of ease of use and usefulness on communication satisfaction are based on a survey of 223 employees at four research universities in Malaysia. The results indicate that there is a positive and significant relationship between these variables in using IBIMS. The study contributes to an enhanced understanding of how organizations might better achieve strategic and effective communication by considering ease of use and communication satisfaction in their choice and implementation of online systems.

Keywords: *Online communication satisfaction; technology acceptance; information management systems; research university; online system*

KEPUASAN KOMUNIKASI DALAM TALIAN KE ARAH PENGGUNAAN SISTEM PENGURUSAN MAKLUMAT BERASASKAN INTERNET: SATU KAJIAN DI EMPAT UNIVERSITI PENYELIDIKAN DI MALAYSIA

Abstrak

Teknologi maklumat dan komunikasi (ICT) kini menyediakan satu bentuk penyertaan yang lebih interaktif dan kolaboratif dalam organisasi. Perkembangan Internet dan Web 2.0 telah membawa kepada pembangunan sistem dalam talian di organisasi, dimana menjadi domain utama yang direkabentuk untuk meningkatkan proses komunikasi organisasi dan interaksi antara kakitangan. Mengadaptasi kepuasan komunikasi dan Model Penerimaan Teknologi (TAM), kajian ini mengkaji kepuasan komunikasi dalam talian bagi penggunaan sistem pengurusan maklumat berasaskan Internet (IBIMS). Dapatan tentang kesan mudah untuk diguna dan kegunaan kepada kepuasan komunikasi adalah berdasarkan kepada kaji selidik dari 223 kakitangan di empat universiti penyelidikan di Malaysia. Hasil kajian menunjukkan bahawa terdapat hubungan yang positif dan signifikan di antara pemboleh ubah dalam penggunaan IBIMS. Kajian ini menyumbang kepada pemahaman bagaimana sesebuah organisasi mencapai satu bentuk saluran komunikasi yang strategik dan berkesan dengan mempertimbangkan mudah untuk diguna dan kepuasan komunikasi dalam pemilihan dan pelaksanaan sistem dalam talian.

Kata kunci: *Kepuasan komunikasi dalam talian; penerimaan teknolog; sistem pengurusan maklumat; universiti penyelidikan; sistem atas talian*

INTRODUCTION

The Malaysian government encourages public and private organizations to use information and communication technology (ICT) and online systems to improve the effectiveness and efficiency of their services. The government views ICT applications as the panacea for improving system delivery, and as a bridge between government agencies and the public. The advances in ICT

have enhanced the development of online applications and systems in higher education institutions; for example, universities have implemented, or are in the process of developing, ICT in their organizations to close the information gaps between faculties and departments, facilitate more distributed systems of information sharing and collaboration, and provide quicker information services for end-users.

Further, the use of online systems in universities has grown rapidly because of the awareness and adoption of the high-level policies in ICT (Abdul Karim & Mohd Khalid, 2003). The government has gradually increased the allocation of expenditure for the development and implementation of ICT in Malaysia. For example, a total of RM 7.885 billion (AUD 2.565 billion) has been spent from the Eighth Malaysia Plan (2001-2005) and RM 12.889 billion (AUD 4.192 billion) under the recent Ninth Malaysia Plan (2006-2010) on ICT in various sectors (Kaliannan, Raman & Dorasamy 2009). Thus, these initiatives are aimed at supporting universities to meet their internal needs in developing the systems and infrastructure of ICT. The use of systems and applications such as Internet-based information management systems (IBIMS) has been significant in ensuring more efficient forms of communication and organizational management in research universities.

However, the uses of IBIMS in universities can create potential acceptance and adoption problems. Some users and employees are uncomfortable with increased use of technology in employment, and find it difficult to adapt to the rapid technological changes in their work practices (Hashim, 2008). The findings of this study demonstrate that a deeper understanding of employees' online communication satisfaction with IBIMS is a significant factor when assessing its influence on employees' attitudes to their core activities, especially teaching and learning, research management and administrative tasks. The article discusses the factors of perceived usefulness, ease of use and online communication satisfaction in using IBIMS among employees at four research universities in Malaysia. The four research universities are University of Malaya (UM), University Science Malaysia (USM), The National University of Malaysia (UKM), and University Putra Malaysia (UPM) (Mohd Majzub 2008).

INTERNET-BASED INFORMATION MANAGEMENT SYSTEMS IN MALAYSIA

Management Information Systems (MIS), information processing systems, information services and computer-based information systems can be used as synonyms for Information Management Systems (IMS). They support the activities, operations, transactions and decision-making processes in organizations (Davis, 1995). Awad (1998) argues that IMS can refer to database and transaction management systems (stand alone and online) that support the delivery of information to stakeholders. In this study, IBIMS refer to online applications or transaction management systems distributed over the Internet

to deliver and share information between people in organizations. As part of developing a knowledge economy, it is important for organizations and people to use the potential of IBIMS in managing data, information and resources in order to enhance their efficiency, performance and productivity.

The earliest steps taken towards the use of online applications or IBIMS in Malaysia came with the launch of the National IT Council (NITC) in 1994 and National IT Agenda (NITA) in 1996. These developments were intended to reinforce ICT initiatives and facilitate the master plan for national ICT development. The main master plan is the Multimedia Super Corridor (MSC). This initiative was announced by former Prime Minister, Tun Dr Mahathir Mohamad, in 1995 and was designed to transform the nation into an information society and values-based knowledge society by 2020.

Among the seven flagship applications under MSC, electronic government (e-government) is the most promoted and encouraged project undertaken by the Malaysian government towards the use of IBIMS in organizations. E-government was launched immediately after the launching of MSC to develop a comprehensive Internet-based systems to transform the way the government operates and delivers services to the staff and people of Malaysia. For example, as shown in *The Civil Service of Malaysia (2001)*, the current pilot projects are electronic services (eservices), Electronic Procurement (eP), Generic Office Environment (GOE), Human Resource Management Information System (HRMIS), Project Monitoring System (PMS), Electronic Labour Exchange (ELX) and EG-AG Integration.

INTERNET-BASED INFORMATION MANAGEMENT SYSTEMS IN RESEARCH UNIVERSITIES

In research universities, IBIMS provide opportunities for people to use them as the medium to shape and produce communication processes that facilitate their core activities, such as teaching activities and research management. In Malaysia, the government allocated part of the country's annual financial budget and financial support to research universities in order to meet their needs in research and innovation, implementation of information technology and information systems, and human capital development. For example, in the 2008 Country's Annual Budget, over RM 1 billion (US\$295.9 million) was allocated to the ICT sector for government including higher education (Yapp, 2007).

These financial allocations include statements about providing people in research universities with access to ICT infrastructures, information sources, and communication platforms, in order to create a collaborative environment in organizational management (Sanyal, 2001). Khayon & Alias (2006) also claim that, the widespread use of ICT bring positive impact on business operations, marketing activities and the success of universities. For example, in research universities, the adoption of IBIMS highlights the importance of ICT and Internet applications in providing greater responsiveness and interactivity between

employees as research colleagues, and as teaching staff in their communications with, and management of, students.

According to Othman, Ismail & Md Raus (2009), online systems such as IBIMS in universities are important to enhance the efficiencies in managing data, information and records. IBIMS also creates one of the most important platforms to equip universities with online information management systems for financial, procurement, and human resources by giving greater accountability and transparency in governance. Research universities should design their strategic plan to integrate electronic governance into their university's central administration in order to be 'world class' or premier universities in the ICT era (Hadi et al., 2002).

IBIMS can also play a significant role in providing useful information about a university's research outcomes, publications and conferences, funding and grants, innovation capabilities and human resources. This study argues that a comprehensive set of IBIMS is an important form of communication platform and information source for successful research universities. The use of IBIMS helps universities and people improve professional practices in research management and administration processes. Therefore, IBIMS are seen as having the potential to improve overall university management processes, especially in administration, teaching and learning, and research management. Table 1 shows some of the many IBIMS features in each research university.

Table 1: Example of IBIMS at research universities

Research University in Malaysia	Example of IBIMS
University of Malaya (UM)	E-Attendance (Intranet) UM Conference Management System University of Malaya Management Information system (UMMIS) UM e-Senate (Intranet) UM e-Meeting
University Science Malaysia (USM)	University Information System – Staff (SMU-S) Human Capital Management System (HCMS) Online Attendance (Kehadiran Online) Travelling Claims (e-Tuntutan) E-Leave System (e-cuti)

The National University of Malaysia (UKM)	Sistem Maklumat Penilaian Kakitangan (Staff Assessment Information System) Sistem Maklumat Kakitangan (Staff Information System) Sistem Permohonan ke Luar Negara (Overseas Application System) Sistem e-cuti (e-leave System) Sistem e-Tiket (e-ticket System)
University Putra Malaysia (UPM)	Sistem Cuti Belajar (Study Leave System) Sistem Perjalanan Luar Negara (Overseas Application System) Aplikasi Cuti Online (Online Leave Application) Aplikasi Keluar Masuk Pejabat (Login and Logout Application) Aplikasi Tempahan Bilik (Room Reservation Application)

Sources: Research University's (UM, USM, UKM and UPM) website

The universities have adopted IBIMS for uses such as streamlining transactions and monitoring routine staff activities to managerial functions such as staff development and compliance.

ONLINE COMMUNICATION SATISFACTION TOWARDS THE USE OF IBIMS

The rapid development of IBIMS in research universities encourages a discussion and analysis of technology uptake, and the issue arising from the implementation of online systems which replace face-to-face interactions: the importance of online communication satisfaction and the acceptance of IBIMS in four research universities in Malaysia. This study claims that key drivers support the success of technology acceptance and adoption among end users in research universities.

Earlier research has shown that several key factors help to explain user acceptance of technology in organizations, including ease of use and usefulness (Davis, 1989), time saving and productivity (Baker et al., 1999), the usability of the system (Preece, 2001), information quality, system quality and service quality (Lin, Fan & Zhang, 2009), and user satisfaction (Simha & Kishore, 2009). In addition, Downs and Hazen (1977), and Sparks (1994) also indicate the importance of research to understand the effectiveness of communication processes to provide communication satisfaction in organizations. User satisfaction in communication processes is one of the important elements when people use various types of technology to access, deliver and share information within organizations. In media and communication research, it has become routine to examine satisfaction, acceptance and adoption in using media technologies. Several communication studies have evaluated the

effectiveness of communication media and new media technologies in various organizations and fields (Anderson & Emmers-Sommer, 2006; Pi et al., 2008; Pornsakulvanich, Haridakis & Rubin, 2008). Downs and Hazen (1977) also stated that communication satisfaction is important to examine and determine in order to know how individuals discover the relationship between communication and satisfaction. In 1978, Hecht defined communication satisfaction as the positive reinforcement that fulfills communicative expectations. Later, Mount and Back (1999) defined communication satisfaction as individual satisfaction with communication in the organization.

Working from these findings, this study argues for the primary importance of communication satisfaction in online environments, specifically a user's online communication satisfaction with IBIMS. Online communication satisfaction in this study focuses on the user's communication satisfaction in online interactions; on communicative expectations and perceptions of the positive advantages of IBIMS in performing daily tasks in research universities. Previous researchers state that the concepts of usefulness and ease of use of systems influence users' attitudes to these systems (Davis, 1989; Hashim, 2008). They also claim that the usefulness and ease of use in Technology Acceptance Model (TAM) are important influences on users' satisfaction. TAM is a widely applied and reliable model that helps researchers to understand usage behavior in systems implementation such as IBIMS.

Therefore, this study (Figure 1) integrates communication satisfaction and TAM to investigate the effect of usefulness and ease of use on online communication satisfaction. This study also uses TAM as a basis to examine the influence of online communication satisfaction on attitude towards and intention to use IBIMS by employees in research universities.

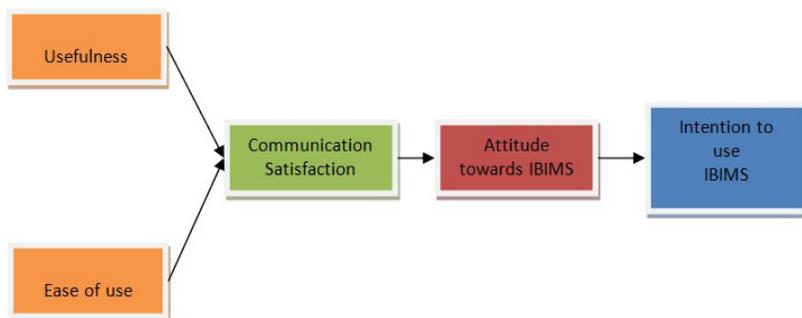


Figure 1: Model of the study

METHODOLOGY OF THE STUDY

A quantitative methodological approach has been chosen to examine the relationships between the variables in using IBIMS. The empirical data was collected through a field survey at the four pioneer research universities in

Malaysia, noted above. Research universities were selected for this study on the basis of their wide use of information management, via online applications in their administrative, teaching and learning, and research management.

Data for the survey was gathered from 240 respondents through a paper-based survey for each university's employees, and 223 returned usable questionnaires. This study selected the random purposeful sampling among administrative officers (professional and management group) and academic staff (lecturers). The majority (85.7%) of respondents are ethnically Malay, followed by Chinese (4.5%), Indian (4.0%) and Bumiputera and others (4.0%). In terms of gender, the ratio of male to female respondents is almost equal: 49.3% male and 50.7% female.

With respect to employment position in the universities, 44.4% of the respondents were part of the executive staff, and 48.9% lecturers. 6.7% of the respondents were from other positions such as language teacher (academic) and research officers. The two groups of respondents were selected for this study because they both spend significant amounts of time using several types of IBIMS in their working environment, for different activities.

The instrument for this study was a questionnaire. The scale items for the instrument were developed using multiple-item scales created, adapted and modified from the many studies, especially from Davis (1989) and Down and Hazen (1977). The statements given in the instrument are grouped into several sections and all the scaled items measured using a five-point Likert scale to measure the level of agreement (1 = strongly disagree and 5 = strongly agree).

Reliability analysis is one method frequently used to describe the rigour, consistency and stability of research processes and findings. A reliability analysis was conducted to examine the internal consistency of research tools that measure the Cronbach's alpha coefficient values. The scale items in the usefulness and ease of use were adapted from Davis (1989) in TAM. The alpha values are as follows: usefulness (0.955), ease of use (0.939), online communication satisfaction (0.947), attitude towards use (0.959) and, finally, intention to use and actual usage (0.929).

These values show that the instrument is reliable and consistent for this study. In addition to that, a factor analysis was performed in order to measure the validity, factor loading and suitability of the constructed items for each section in this survey. The researcher conducted this analysis to confirm that the items and variables within the factor loading were significant (i.e., factor loadings higher than 0.5). Thus, the data was analyzed using SPSS 17.0 to examine the relationships between key variables in the proposed model.

RESULTS OF THE STUDY

This analysis was designed to test the effects of two factors in the Technology Acceptance Model (TAM): usefulness and ease of use with online communication satisfaction in using IBIMS. The multiple regression analysis was used to

investigate the relationship between variables under study. Table 2 shows the proposed model summary for the multiple regression analysis and indicates that the two factors proposed, usefulness and ease of use explains 52.7% of the variance in online communication satisfaction.

Table 2 Model Summary

Model	Dependent Variable	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	OCS	0.726(a)	0.527	0.523	0.48790

Predictors: (Constant); U, EOU

Table 3 presents the results of the regression analysis to ensure the validity of the proposed model of the study. The finding shows the overall regression model is statistically significant on online communication satisfaction with $F= 122.477$ and $p=0.000 < 0.01$.

Table 3 The results of the Regression Analysis

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	58.311	2	29.156	122.477	0.000*
	Residual	52.371	220	.238		
	Total	110.682	222			

Predictors: (Constant); U, EOU

Dependent Variable: OCS

* $p < 0.01$

Table 4 shows that two of the causal relationships between variables proposed in the study are well accepted and supported.

Table 4 Coefficients

Model	Unstandardised Coefficients		Standardised Coefficients	T	Sig.
	B	Std. Error	Beta		

1	(Constant)	.886	.172		5.144	.000
	Usefulness	.274	.058	.317	4.712	.000*
	Ease of Use	.417	.061	.462	6.864	.000*

Predictors: (Constant): U, EOU
 Dependent Variable: OCS

* $p < 0.01$

Furthermore, the analysis indicates that online communication satisfaction is statistically significant on attitude towards use ($p < 0.01$) and explains 60.4% of the variance in attitude towards use. The study also shows that online communication satisfaction has a statistically significant effect on intention to use ($p < 0.01$) and explains 43.6% of the variance in intention to use.

The analysis thus reveals that the variables do have a significant effect on and contribute to employees' online communication satisfaction when they are utilizing IBIMS in their universities. Additionally, this study also demonstrates that employees' attitudes have a significant effect on the intention to use IBIMS.

DISCUSSION AND CONCLUSION

The results indicate that the usefulness and ease of use have significant effects on employees' online communication satisfaction in using IBIMS in research universities in Malaysia. The study highlighted the quantitative approach in contributing a significant finding for universities: these organizations need to understand more about employees' perceptions and expectations of the value of IBIMS to their daily research, teaching, administrative and managerial work. Combined with the results from the second qualitative stage of the research, this insight helps management of universities to make effective and correct decisions in improving users' online communication satisfaction through two key factors from TAM, usefulness and ease of use.

The study reveals that employees are more satisfied with online communication satisfaction in using IBIMS when they perceive more benefit and ease of using the system to perform their tasks. The points of view show that the usefulness and ease of use as argued by Davis (1989) are important key factors in enhancing user satisfaction. The importance of satisfaction is evident, and this study reveals that employees' communication satisfaction can be enhanced through the usefulness of the system and ease of use of the system. The study contributes to the theoretical extension of technology acceptance model by building on the knowledge of other scholars on this subject.

This study also contributes by a demonstration that there is a positive relationship between online communication satisfaction, attitudes and intention to use. A high score of online communication satisfaction has a greater effect

and positive score on attitude towards and intention to use IBIMS. In their studies, Downs and Hazen (1977), and Sparks (1994) indicate the importance of communication satisfaction in providing effective communication processes among employees in organizations.

This study has attempted to bridge the gap in empirical study in understanding users' online communication satisfaction in education institutions in Malaysia. A further contribution is to understand technology uptake among different groups of users, and especially how academics and administrative officers perceive online communication satisfaction in relation to their daily activities. The study fills a gap by supporting the foundation of a new model, which explains the success of TAM and communication satisfaction in technology acceptance from the perspectives of a specific culture, region, and kind of employment. It begins an understanding of to what extent the above variables are important in university employees' satisfaction with IBIMS use. In research universities, the positive acceptance of IBIMS usage is important in sustaining a positive impact on internet-based communication processes, working efficiency, online teaching and learning, collaborative works and integrated organization management.

Considering the study's practical implications, the development of IBIMS will succeed in universities when their employees find usefulness and ease of use with regard to the systems. To achieve the maximum efficiency benefits of streamlining administrative systems, top management and system developers in research universities need to understand the effects of usefulness, ease of use and communication satisfaction, that is, the human factors integral to the success of their strategic software development plans. In line with that argument, this study claims that there are important practical implications for Malaysian research universities to encourage and invite end users (employees) to contribute to software/system developments in order to understand the social and human needs of the systems.

As with previous empirical studies, this study has limitations. The empirical data was collected in four research universities, and from administrative officers and academics. Future research is required to further examine and confirm the findings of the study with different employee groups such as implementation personnel (Grade 40 and below), and in other higher education institutions. Second, it will be necessary to examine and confirm the findings with specific or particular systems which are used by all employees in research universities. Third, conducting a long-term quantitative study would show how individual employees' perceptions about IBIMS in the universities changes over time and use. Comparative studies in the region's research universities could also be useful. Finally, future investigations could test the model and hypotheses of technology adoption and communication satisfaction in relation to social network systems such as Facebook and Twitter. These approaches could help researchers to identify the importance of online communication satisfaction in using social media. What is learned about ease of use, and usefulness in turn

could be transferable to the design of systems which manage routine activities at research universities.

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