Determinants of Intention to Use an Online Bill Payment System among MBA Students

T. Ramayah
Chin Yee Ling
School of Management, Universiti Sains Malaysia
E-mail: ramayah@usm.my

Norazah Mohd Suki
College of Business Management, Universiti Tenaga Nasional, Malaysia
E-mail: norazah@kms.uniten.edu.my

Amlus Ibrahim
Fakulti Pengurusan Teknologi, Universiti Utara Malaysia
E-mail: amlus@uum.edu.my

ABSTRACT

This study investigates and examines the intention to use an online bill payment among part time MBA students in Universiti Sains Malaysia (USM), Penang. A research framework based on the extended Technology Acceptance Model (TAM2) and Social Cognitive Theory is developed and modified in order to identify factors that would determine and influence the intention to use an online bill payment system. A survey involving a total of 120 university part time MBA students was conducted. The results reveal that perceived ease of use and perceived usefulness are the significant drivers of intention to use the online bill payment system. Subjective norm, image, result demonstrability and perceived ease of use were also found to be the key determinants of perceived usefulness whereas perceived risk was found to be negatively related to usefulness. This is very important as many researchers have shown that perceived usefulness is the most crucial factor in the decision to adopt and continue using a given technology. Computer self-efficacy plays a significant role in influencing the perceived ease of use of the online bill payment system

Keywords: Online bill payment, subjective norm, image, result demonstrability, perceived ease of use, perceived usefulness, computer self efficacy, intention to use

INTRODUCTION

The advent of the Internet has spawned many new opportunities for businesses. The development of the Internet as the new marketplace has led to the boom of Internet payment or also known as e-payment. It was always expected that the Internet would have huge potential not only for communication (Drèze & Zufryden, 1997) but also for electronic commerce. According to a recent issue of Current Population Report on home

computers and Internet use in the United States, more than 30 million adults 18 years and older used the Internet at home for shopping or paying bills online. (Yang & Lester, 2004) According to the report, shopping or paying bills online ranked fourth among 10 specific Internet uses (Yang & Lester, 2004). A recent Roper-Starch poll (Media Awareness Network, 2003) surveyed 1,000 Internet users about their perceptions of the Internet's necessity in everyday life. They found that 71% of the respondents routinely research their product purchases online. Thus, paying bills via the Internet is one of the most rapidly growing forms of e-invoicing. Online bill payment provides the advantages of no crowds, no transportation costs, no traveling time, no physical movement for paying money, no parking problem and no queuing for paying money, getting your bills paid in a blink of an eye.

According to the National Information Technology Council (NITC), there are 8,692,100 Internet users, which represent 34.0% of population of Malaysia as of December 2003. (The Star, October, 8 2004). According to data released by International Data Corporation (IDC) Malaysia, at least one-third of the Internet users in Malaysia had purchased over the Internet. In addition, 55% of the Internet users had purchased online in 2001 and online spending would increase by 85% in 2002 (Yeow, Wong, Lai, Keok & Tan, 2004).

The development of Internet has led to the birth of online payment or also known as electronic payment (e-payment). Many local banks have begun to offer bill payments online as part of their Internet banking push. Users can practically pay any bills ranging from utility, telecommunications, insurance and many others and the list keeps growing from day to day. Therefore, the objective of this research is to examine the factors that shape and influence online bill payment behavior among a group of people who are increasingly being pressured for time, the part time MBA students.

CONCEPTUAL FOUNDATION

Theory of Reasoned Action (TRA)

There is a growing body of academic research being focused on examining the determinants of technology acceptance and its utilization among users. (Moore & Benbasat, 1991; Mathieson, 1991; Davis, 1989; Davis et al., 1989; Taylor & Todd, 1995). TAM model has been adapted from the theory of reasoned action (TRA) (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). TRA has proven that the utilization of a particular system is determined by the behavior intention of the users. Adoption behavior is also influenced by the attitude and subjective norm of the users. (Malhotra & Galletta, 1999).

The TRA model (Fishbein and Ajzen, 1975; Ajzen & Fishbein, 1980) is as shown in Figure 1.
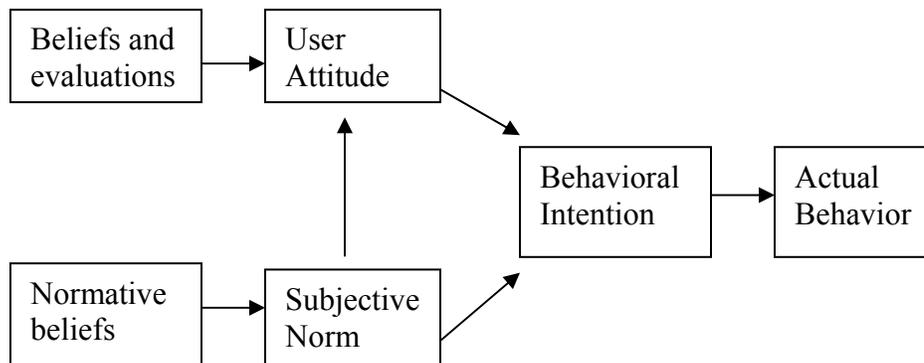
Figure 1. Theory of Reasoned Action

The Technology Acceptance Model (TAM)

TAM replaces many of TRA's attitude measures with the two technology acceptance measures – ease of use, and usefulness. TRA and TAM, both of which have strong behavioral elements, assume that when someone forms an intention to act, that they will be free to act without constraints, environmental or organizational limits, or unconscious habits which will limit the freedom to act (Bagozzi et al., 1992).

One key benefit of using TAM to understand system usage behavior is that it provides a framework to investigate the effects of external variables on system usage. (Hong et al., 2001). Based on theories in social psychology, such as the theory of reasoned action (TRA) (Ajzen and Fishbein, 1980) and the theory of planned behavior (TPB) (Ajzen, 1985), the TAM has been validated as a powerful and parsimonious framework for explaining the adoption of IT by the users. (Davis, 1989; Davis et al., 1989). TAM suggests two beliefs – perceived usefulness and perceived ease of use - are instrumental in explaining the variance in the intention of the users. Perceived usefulness is defined by Davis (1989) as the extent to which a person believes that using a particular system will enhance his or her job performance, while perceived ease of use is defined by Fred Davis as the extent to which a person believes that using a particular system will be free of effort. Among the beliefs, perceived ease of use is hypothesized to be a predictor of perceived usefulness. Furthermore, both types of beliefs are influenced by external variables. Several researchers have replicated Davis's original study (Davis, 1989) to provide empirical evidence on the relationships that exist between usefulness, ease of use and system use (Adams, Nelson & Todd, 1992; Davis et al., 1989; Hendrickson, Massey & Cronan, 1993; Segars & Grover, 1993; Subramaniam, 1994; Szajna, 1994).

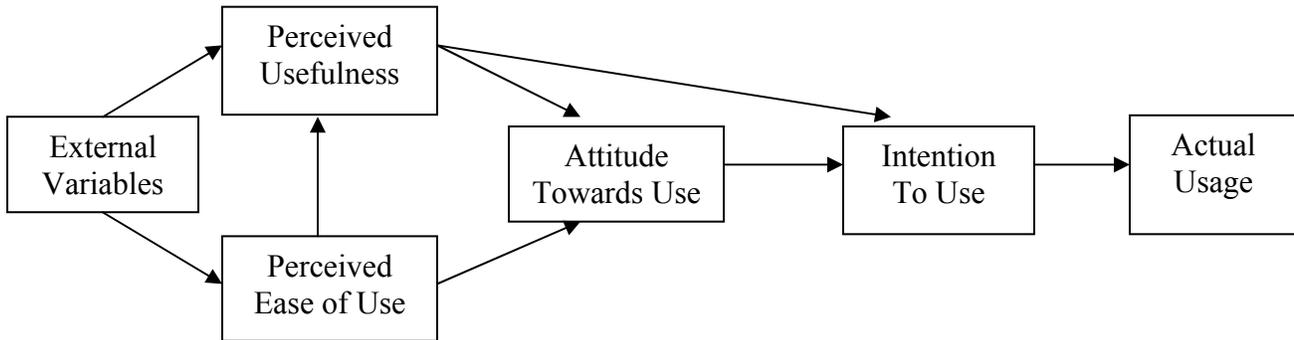The TAM model (Davis et al., 1989) is as shown in Figure 2.

Figure 2. Technology Acceptance Model (TAM) (Davis et al., 1989)

TAM model has been improved to TAM2 which contains another determinant to the acceptance of new technology – subjective norms (SN). Venkatesh and Davis (2000) have concluded that subjective norms have a direct positive relationship with perceived usefulness (PU). Subjective norms refer to "the person's perception that most people who are important to him think he should or should not perform the behavior in question" (Fishbein & Ajzen 1975). It is related to intention because people often act based on their perception of what others think they should do. Subjective norms have been found to be more important prior to, or in the early stages of innovation implementation when users have limited direct experience from which to develop attitudes (Hartwick & Barki 1994; Taylor & Todd 1995).

Figure 4 shows the research model. This study investigates the intention to use the online bill payment system among part time MBA students.
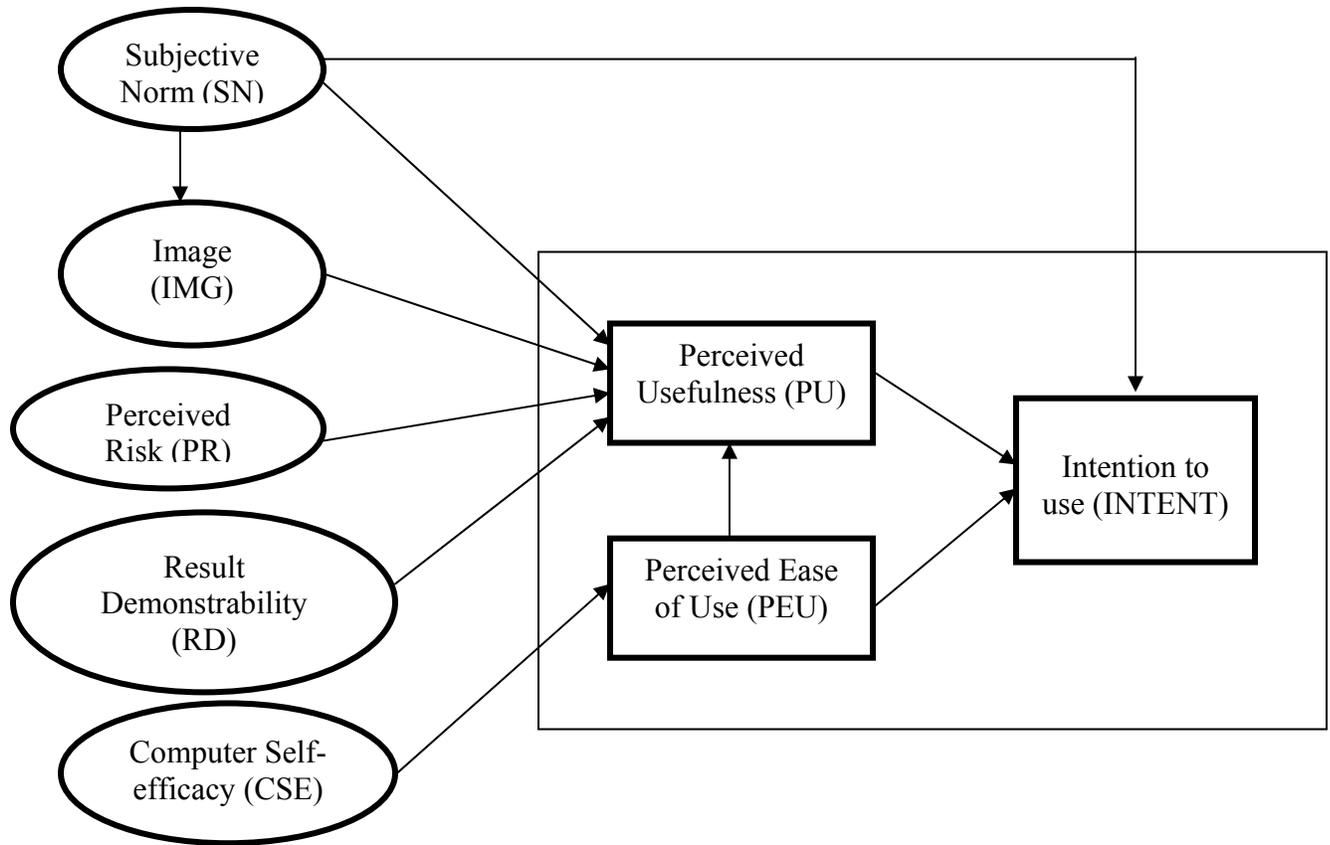
Figure 4. Research Framework

Subjective Norm (SN) and Image (I). Fishbein and Ajzen (1975) defined SN as "the person's perception that most people who are important to him think he should or should not perform the behavior in question" (Tan & Teo, 2000). Early studies by Davis failed to show significant relationships between SN and use. Thus SN is not generally included in TAM. For this study, closest friends, family or peers are likely to have influence on potential adopters and users of online bill payment, thus SN is included in the research model. For instance, if a close friend suggests that a particular system (online bill payment) might be useful, a person may come to believe that it actually is useful, and in turn form an intention to use it. Therefore, the following hypothesis is tested:

> H1:   *Subjective Norm has a positive direct effect on Perceived Usefulness of the Online Bill Payment system.*
> H2:   *Subjective Norm has a positive effect on Online Bill Payment system.*

Moore and Benbasat (1991) define Image as "the degree to which use of an innovation is perceived to enhance one's status in one's social system (Chan & Lu, 2004). The increased power and influence resulting from elevated status provides a general basis for

5

greater productivity. An individual may thus perceive that using such a system will lead to improvements in his/her job performance indirectly due to system use (Chan & Lu, 2004). The identification effect is captured in TAM2 by the effect of SN on IMAGE, coupled with the effect of IMAGE on PU (Chan & Lu, 2004). Thus, this study postulates that:

H3:   *Subjective Norm has a positive effect on Image.*

H4:   *Image has a positive effect on Perceived Usefulness of the Online Bill Payment system.*

Result Demonstrability (RD). TAM2 (Venkatesh & Davis, 2000) theorizes that RD, defined by Moore and Benbasat (1991) as the "tangibility of the results of using an information technology", will directly influence Perceived Usefulness (PU) (Chan & Lu, 2004). Based on empirical research, Agarwal and Prasad (1999) found a significant correlation between usage intentions and RD. Therefore, the following hypothesis is tested:

H5:   *Result Demonstrability has a positive effect on Perceived Usefulness of the Online Bill Payment system.*

Perceived Risk (PR). Many people view that electronic commerce as a risk undertaking because they believe that using Internet application is lack of security and privacy. Therefore, it is expected that only individual who perceived using Internet Payment as a low risk undertaking would have a tendency to perceive it as useful (Chan & Lu, 2004), and it follows that:

H6:   *Perceived Risk has a negative effect on Perceived Usefulness of the Online Bill Payment system.*

Computer Self-Efficacy (CSE). Self-efficacy is an important determinant of the perceptions of users about such technologies (e.g., Burkhardt & Brass, 1990; Gist, Schwoerer & Rosen, 1989; Hill, Smith & Mann, 1986; Hill, Smith & Mann, 1987). Venkatesh and Davis (1996) have suggested that users strongly anchor ease of use perceptions about any system to their computer self-efficacy (Chan & Lu, 2004). Therefore, this research attempts to find out and understand acceptance of Internet Payment as a function of underlying situation of high self-efficacy of the target respondents, thus the current research framework posits that:

H7:   *Computer Self-Efficacy has a positive effect on Perceived Ease of Use of the Online Bill Payment system.*

Perceived Ease of Use (PEU and Perceived Usefulness (PU). There is empirical evidence that has accumulated over a decade that suggest PEU is significantly linked to intention to adopt Internet Payment, both directly and indirectly via its impact on perceived usefulness (Davis, Bagozzi & Warshaw, 1989; Venkatesh, 1999; Venkatesh & Davis, 2000; Chan & Lu, 2004). Past researches (Davis, 1989; Mathieson, 1991; Adams et al., 1992; Segars & Grover, 1993, Igbaria et al. 1995; Ndubisi et al., 2001; Ramayah et al., 2002; Ramayah et al., 2003a; Ramayah et al., 2003b; Ramayah and Aafaqi, 2004) has shown that perceived usefulness influences usage directly. Also in general, a system or technology that is perceived to be easy to use or learn would be anticipated to be more useful to the user. This notion was first supported by Davis, Bagozzi and Warshaw (1989) and again justified through many empirical tests (e.g. Mathieson, 1991; Chau, 2001; Ramayah et al, 2003a; Ramayah et al., 2003b; Ramayah and Aafaqi, 2004) that followed. Therefore, the following hypotheses are forwarded:

> H8: *Perceived Ease of Use has a positive effect on Perceived Usefulness of the Online Bill Payment system.*

> H9: *Perceived Usefulness has a positive effect on the Intention to use the Online Bill Payment system.*

> H10: *Perceived Ease of Use has a positive effect on the Intention to use the Online Bill Payment system.*

METHODOLOGY

A survey involving a total of 120 university part time MBA students in University of Science Malaysia, Penang, who are currently users of the Internet, was conducted in order to determine their intention to use the online bill payment system. In order to conduct this research, "locality" sampling is used. "Locality" sampling is carried out in USM compound, lecture classes and hostels. This method is cost-effective and very useful in making decision for a selected population. Data collection was conducted from end of Jan to the early Feb, 2005. The questionnaires were handed out to part time students and were collected immediately after they were completed.

Measures of the constructs

To ensure the content validity of the scales, the items selected must represent the concept about which generalizations are to be made (Bohmstedt, 1970). Therefore, items selected for the constructs are mainly adapted from prior studies to ensure content validity (Wang et al., 2003). The perceived ease of use and perceived usefulness were taken from previous validated inventory (Davis, 1989; Davis et al., 1989) are modified to fit the specific technology studied. The items to measure behavioral intention are taken from previous applications of TAM (Agarwal & Prasad, 1999; Venkatesh & Davis, 1996). Three items for the computer self-efficacy construct were adapted from the original instrument of computer self-efficacy developed by Compeau and Higgins (1995). A

Likert type scale, with anchors ranging from 1 "strongly disagree" to 5 strongly agree" were used for all questions.

RESULTS

The profile of respondents is presented in Table 1.

Table 1
Sample Profile

Variable		Frequency	Percentage (%)
Gender	Male	70	55.0
	Female	50	45.0
Race	Malay	45	40.0
	Chinese	47	36.7
	Indian	20	14.1
	Others	8	9.20
Age	30 years and less	25	20.83
	31 to 35 years	65	54.17
	36 to 40 years	18	15.00
	Above 40 years	12	10.00
Monthly Income	Less than RM24,000	18	15.00
	RM24,00 – RM36,000	52	43.33
	RM36,001 – RM48,000	30	25.00
	More than RM48,000	20	16.67

Goodness of the Measures

In this research, "Cronbach Alpha" is used to assess the internal consistency or homogeneity among the items. It is used to measure the reliability of subjective norm, image, result demonstrability, perceived risk, and perceived ease of use, perceived usefulness, computer self-efficacy and intention to use an online bill payment system.

Table 2
Reliability Analysis

Factors	Number of Items	Items Deleted	Alpha
Subjective Norm	3	-	0.77
Image	3	-	0.82
Result Demonstrability	4	-	0.79
Perceived Risk	5	-	0.79
Perceived Ease of Use	4	-	0.84
Perceived Usefulness	3	-	0.90
Computer Self-Efficacy	3	-	0.74
Intention to use	2	-	0.70

Table 2 shows the reliability of factors that shape and influence the intention to use an Online Bill Payment system, namely subjective norm, image, result demonstrability, perceived risk, perceived ease of use, perceived usefulness and computer self-efficacy. These seven factors have shown high reliability values which are above 0.7. Subjective norm has a reliability value of 0.77 while image has a reliability value of 0.82. Result demonstrability has a reliability value of 0.79 whereas reliability value for other factors such as perceived risk, perceived ease of use and perceived usefulness are 0.79, 0.84 and 0.90 respectively, while computer self-efficacy has a reliability value of 0.74. No items were deleted in this research. All the reliability values are considered high, which supports the reliability of the measurement used in this study.

Table 3 presents the descriptive analysis of the main variables.

Table 3
Descriptive Analysis

Independent Variables	Mean	Standard Deviation
Subjective Norm	3.76	0.52
Image	4.16	0.32
Result Demonstrability	3.92	0.27
Perceived Risk	2.17	0.62
Perceived Ease of Use	4.35	0.28
Perceived Usefulness	4.69	0.34
Computer Self-Efficacy	4.10	0.40
Intention to use	3.33	0.93

The results from the correlation analysis (Table 4) do not indicate any serious problem of multicollinearity.

Table 4
Intercorrelations of the major variables

	SN	IMG	PR	RD	CSE	PU	PEU	Intent
SN	1.000							
IMG	0.473**	1.000						
PR	0.091	0.205*	1.000					
RD	0.549**	0.496**	0.006	1.000				
CSE	0.408**	0.354**	0.386**	0.292**	1.000			
PU	0.586**	0.470**	-0.214**	0.659**	0.228**	1.000		
PEU	0.572**	0.404**	0.001	0.689**	0.352**	0.610**	1.000	
Intent	0.484**	0.423**	0.093	0.598**	0.542**	0.505**	0.621**	1.000

** $p < 0.01$, * $p < 0.05$

Regression analysis has been done in order to examine and test hypotheses. Results are described below.

Table 5
Regression Analysis against Intention to use

Independent Variables	Std. B
Subjective Norm	0.125
Perceived Ease of Use	0.484 **
Perceived Usefulness	0.193*
R²	0.464
Sig-F	0.000

** $p < 0.01$

The results of the regression analysis showed a significant model explaining 46.4% of the variation in intention to use. Perceived ease of use ($\beta = 0.484$, $p < 0.01$) and perceived usefulness ($\beta = 0.193$, $p < 0.05$) was found to be significant giving support for H9 and H10 of the study. H2 of the study were however not supported. The findings indicate that the online payment system must be perceived to be useful and easy to use before users are willing to use them.

Table 6
Regression Analysis against Perceived usefulness

Independent Variables	Std. B
Subjective Norm	0.324**
Image	0.179*
Result Demonstrability	0.327**
Perceived Risk	-0.288**
Perceived Ease of Use	0.184*
R²	0.656
Sig-F	0.000

** $p < 0.01$, *$p < 0.05$

Another regression analysis was run to see the impact of subjective norm, image, result demonstrability, perceived risk and ease of use on the perceived usefulness of the online bill payment system. The resulting model was significant explaining 65.6% of the variation in usefulness of the online bill payment system. All five variables were found to be significant predictors of usefulness. Subjective norm ($\beta = 0.324$, $p< 0.01$), Image ($\beta = 0.179$, $p< 0.05$), result demonstrability ($\beta = 0.327$, $p< 0.01$) and ease of use ($\beta = 0.184$, $p< 0.05$) were found to be positively related to perceived usefulness. Perceived risk ($\beta = -0.288$, $p< 0.01$) was found to be negatively related to perceived usefulness. These results give support to H1, H4, H5, H6 and H8 of this study.

The remaining hypotheses which posits that computer self efficacy will positively influence perceived ease of use and subjective norm will positively influence image was tested using the Pearson product moment correlation presented in Table 4. It can be seen that self efficacy ($r = 0.352$, $p< 0.01$) is positively related to ease of use and subjective norm ($r = 0.473$, $p< 0.01$) is also positively related to image thus supporting H7 and H3 of the study.

DISCUSSION

Perceived ease of use and perceived usefulness was found to be the significant drivers of intention to use the online bill payment system. This finding is consistent with previous studies on TAM (Chan & Lu, 2004). A plausible reason for this is that when a system is perceived to be useful and user-friendly, learning to use it becomes much easier, thus the likelihood of potential users to use would increase. This finding concurs with the results of many previous studies (Davis, 1989; Mathieson, 1991; Adams et al., 1992; Segars & Grover, 1993, Igbaria et al. 1995; Ndubisi et al., 2001; Ramayah et al., 2002; Ramayah et al., 2003a; Ramayah et al., 2003b; Ramayah and Aafaqi, 2004). Subjective norm did not however show any significant impact on intention to use. One possible argument could be that these MBA students are quite matured and have been through several years of work experience and would prefer to use their own judgment rather than the recommendations of their peers, friends and family members. Subjective norm however,

was a significant predictor of image which suggests the influence of significant others in the promotion of image of a given technology.

It was also interesting to note that Image perceived by the potential users were very important and was a significant predictor of perceived usefulness. This supports the works of Chan and Lu (2004) who found that image is an important driver of Internet banking usage. Moore and Benbasat (1991) argued that the increased power and influence resulting from elevated status provides a general basis for greater productivity. An individual may thus perceive that using such a system will lead to improvements in his/her job performance indirectly due to system use (Chan & Lu, 2004). Perceived risk was significantly negatively related to perceived usefulness. This implies that if potential users perceive online bill payment to be a security risk, they will be more likely to perceive it as less useful. However, users may not perceive any risk after their adoption of the system itself.

Result demonstrability was also found to be positively related to usefulness. Venkatesh and Davis (2000) in TAM2 theorized that result demonstrability will directly influence perceived usefulness. This is also supported by the work of Chan and Lu (2004). Prior studies of TAM (Venkatesh & Davis, 2000) found that perceived ease of use positively influenced perceived usefulness. This study also found the same relationship to exist. A system that is easy to use will be perceived to be more useful compared to a difficult system.

Computer self-efficacy was found to be a significant factor influencing perceived ease of use of online bill payment system. This implies that individuals with higher computer self-efficacy will perceive online bill payment to be easier to use. This concurs with the suggestion by Venkatesh and Davis (1996) that users strongly anchor ease of use perceptions about any system to their computer self-efficacy.

CONCLUSION

This study has identified the factors influencing the intention to use an online bill payment system. Firstly, the present study has substantiated the empirical link between perceived usefulness, perceived ease of use and subjective norm with intention to use an online bill payments system. The results supported two out of the three hypotheses generated. The study has also contributed to a more comprehensive understanding of the determinants of the perceived usefulness of online bill payment system. Perceived usefulness and perceived ease of use and have emerged as key determinants in influencing the intention to use the online bill payment system. The present research is important to the policy makers and organization that provide infrastructure and services such as network infrastructure, e-payment systems, secure web transaction and smart cards as to the factors which should be focused on when they develop and maintain their own systems.

REFERENCES

Adams, D. A., Nelson, R. R. & Todd, P. A. (1992). Perceived usefulness, ease of use, and usage of information technology: A replication, *MIS Quarterly*, 16, 227-247.

Agarwal, R. & J. Prasad (1998). The antecedents and consequents of user perceptions in information technology adoption, *Decision Support System*, 22(1), 15-29.

Agarwal, R. & Prasad, J. (1999). Are individual differences germane to the acceptance of new information technologies? *Decision Sciences,* 30(2), 361-391.

Ajzen, I. (1985). From intentions to actions: A theory of planned behaviour, in J. Kuhl, J. Beckmann (eds), *Action Control from Cognition to Behavior*, Springer Verlag, New York, 11-39

Ajzen, I. (1991). The Theory of Planned behavior, *Organizational Behavior and Human Decision Processes*, 50, 179-211.

Ajzen, I. & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*, Englewood Cliffs, NJ: Prentice Hall.

Bagozzi, R. P., Davis, F. D. & Warshaw, P. R. (1992). Development and test of a theory of technological learning and usage. Human Relations, 45(7), 660-686.

Bohmstedt, G. W. (1970). Reliability and validity assessment in attitude measurement. In G. F. Summers (Ed.), *Attitude Measurement*. Chicago: Rand-McNally.

Burkhardt, M. E. & Brass, D. J. (1990). Changing Patterns or Patterns of Change: The Effects of a Change in Technology on Social network Structure and Power, *Administrative Science Quarterly*, 35(1), 104-127.

Chan, S. C. & Lu, M. T. (2004). *Understanding internet banking adoption and use behavior: a Hong Kong perspective.* Journal of Global Information Management, 12(3), 21-43.

Chau, P. Y. K. (2001). Influence of Computer Attitude and Self-Efficacy on IT Usage Behavior, *Journal of End User Computing*, 12(1), 26-33.

Compeau, D. R. & Higgins, C. (1995). Computer self-efficacy: Development of a measure and initial test, *MIS Quarterly,* 19(2), 189-211.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.

Davis, F. D., Bagozzi, R. P. & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35, 982-1003.

Drèze, X. & Zufryden, F. (1997). Testing Web Site Design and Promotional Content, *Journal of Advertising Research*, 1, 7-18.

Fishbein, M. & Ajzen, I. (1975). *Belief, attitude, intention and behavior: an introduction to theory and research*, Addison-Wesley: Reading, MA.

Gist, M. E., Schwoerer, C. & Rosen, B. (1989). Effects of Alternative Training Methods on Self-Efficacy and Performance in Computer Software Training, *Journal of Applied Psychology*, 74, 884-891.

Hartwick, J. & Barki, H. (1994). Explaining the role of user participation in information system use, *Management Science*, 40(4), 440-465.

Hendrickson, A. R., Massey, P. D. & Cronan, T. P. (1993). On the test-retest reliability of perceived usefulness and perceived ease of use scales. *MIS Quarterly*, 17, 227-230.

Hill, T., Smith, N. D. & Mann, M. F. (1986). Communicating Innovations: Convincing Computer Phobics to Adopt Innovative Technologies. In Lutz (Ed.). *Advamces in Consumer Research*. Provo, UT: Associateion of Consumer Research, 419-422.

Hill, T., Smith, N. D. & Mann, M. F. (1987). Role of Efficacy Expectations in Predicting the Decision to Use Advanced Technologies: The Case of Computers, *Journal of Applied Psychology*, 72, 307-313.

Hong, W. Y., Thong, J. Y. L., Wong, W. M., & Tam, K. Y. (2001). Determinants of user acceptance of digital libraries: An empirical examination of individual differences and system characteristics. *Journal of Management Information Systems*, 18(3), 97-124.

Igbaria M, Iivari, J. & Maragahh, H. (1995). Why do individuals use computer technology? A finnish case study, *Journal of Information & Management*, 29, 227-238.

Malhotra, Y. & Galletta, D. F. (1999). Extending the Technology Acceptance Model to Account for Social Influence: Theoretical Bases and Empirical Validation, in: *Proceedings of the 32nd Hawaii International Conference on System Sciences*, IEEE Comput. Soc. Press, Los Alamitos.

Mathieson, K. (1991). Predicting User Intentions: Comparing the Technology Acceptance Model with the Theory of Planned Behavior, *Information Systems Research*, 2(3), 173-191.

Moore, G. C. & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation, *Information Systems Research,* 2(3), 192-222.

Ndubisi, N. O., Jantan, M. & Richardson, S. (2001). Is the technology acceptance model valid for entrepreneurs? Model testing and examining usage determinants, *Asian Academy of Management Journal*, 6(2), 31-54.

Ramayah, T. & Aafaqi, B. (2004). Role of Self-Efficacy in e-Library usage among Students of a Public University in Malaysia, *Malaysian Journal of Library & Information Sc*ience, 9(1), 39-57.

Ramayah, T., Dahlan, N., Mohamad, O. & Siron, R. (2002). Technology Usage Among Owners/Managers of SME's: The Role of Demographic And Motivational Variables. The proceedings of The 6th Annual Asian-Pacific Forum for Small Business on "*Small and Medium Enterprises Linkages, Networking and Clustering"*, Kuala Lumpur, Malaysia.

Ramayah, T., Jantan, M. & Bushra, A. (2003a). Internet Usage Among Students of Institutions of Higher Learning: The Role of Motivational Variables. *The Proceedings of the 1st International Conference on Asian Academy of Applied Business Conference,* Sabah, Malaysia, 10-12th July, 2003.

Ramayah, T., Jantan, M., Mohd Noor, M. N., Razak, R. C. & Koay, P. L. (2003b). Receptiveness of Internet Banking by Malaysian Consumers: The Case of Penang, *Asian Academy of Management Journal*, (8) 2, 1-29

Segars, A. H., & Grover, V. (1993). Re-examining perceived ease of use and usefulness: A confirmatory factor analysis. MIS Quarterly, 17, 517-525.

Subramanian, G. H. (1994). A replication of perceived usefulness and perceived ease of use measurement. Decision Sciences, 25(5/6), 863-873.

Szajna, B. (1994). Software evaluation and choice: predictive evaluation of the Technology Acceptance Instrument. MIS Quarterly, 18(3), 319-324.

Tan, M. and Teo, T. S. H. (2000). *Factors Influencing the Adoption of Internet Banking. Journal of the Association for Information Systems,* 1, Article 5, 1-42.

Venkatesh, V. & Davis, F. D. (1996). A Model of the Antecedents of Perceived Ease of Use: Development and Test, *Decision Sciences*, 27(3), 451-481

Venkatesh, V. & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies, *Management Science*, (46:2), 186-204.

Venkatesh, V., Morris, M. G., Davis, G. B. & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view, *MIS Quarterly*, 27(3), 425-478.

Wang, Y. S., Wang, Y. M., Lin, H. H. & Tang, T. I. (2003). Determinants of user acceptance of Internet banking: An empirical study, *International Journal of Service Industry Management*, 14(5), 501-519.

Wildemuth, B. M. (1992). An empirically grounded model of the adoption of intellectual technologies, *Journal of the American Society for Information Science*, 43(3), 210-224.

Yang, B. & Lester, D. (2004). Attitudes Toward Buying Online, *CyberPsychology & Behavior*, 7(1), 85-91.

Yeow, P. H. P., Wong, C. C., Lai, N. T., Keok, C. H. and Tan, H. M. (2004). Online Purchasing Behaviour of Malaysian tertiary Education Students (MTES), *Multimedia Cyberscape Journal*, 2(1), 24-34.