

# 國科會結案報告

科技接受度在網際網路上的應用：權變因素的探討

計劃編號 NSC89-2416-H002-046

計劃執行人：吳玲玲

計劃執行單位：台灣大學資管系

The technology acceptance model (abbreviated as TAM) has been applied to account for usage of various information systems and has received substantial empirical support (Davis, 1989; Adams, Nelson & Todd, 1992; Straub, Limayem & Evaristo, 1995; Szajna, 1996; Chau, 1996). In this model, the central constructs are perceived usefulness and perceived ease of use of information system, which further affect attitudes and behavioral intention of usage, as illustrated in Figure 1

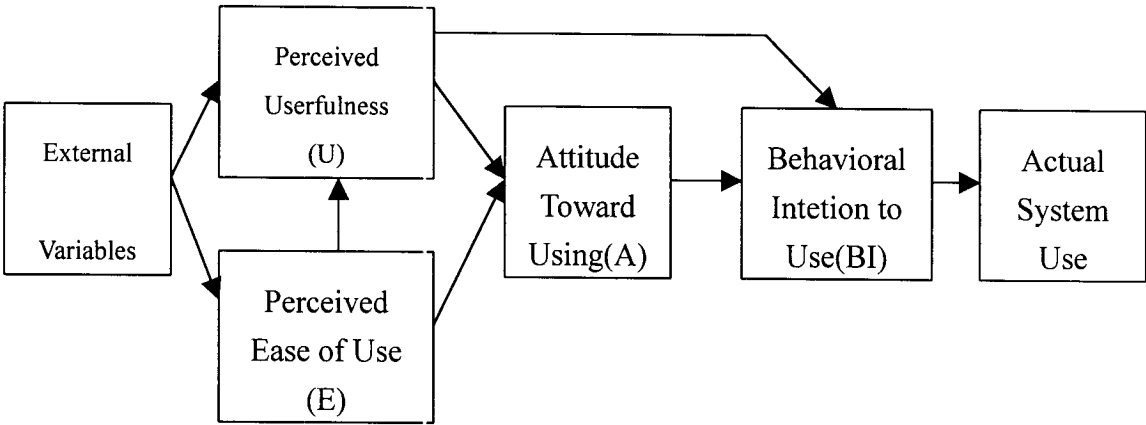


Figure 1: Technology Acceptance Model (Davis, 1989)

In particular, TAM has received support from investigations on various kinds of information systems, including word processing, spreadsheet, graphics tools, email, etc. (Nelson & Todd, 1992; Chau, 1996; Lucas & Spitler, 1999; Hu, Chau, Sheng & Tam, 1999). It follows that usage of the Internet, which applies diverse functions of different information systems (e.g. word processing, graphics, email), should also be accounted for by TAM.

However, the study of Fenech (1998) suggests that TAM (or perceived usefulness and perceived ease of use) has little explanatory power for usage of WWW. This study is to explore the possible reasons for the inconsistency between the research results of traditional information systems and the Internet. Among diverse commercial applications of the Internet, online security trading is one of the most popular activities. Therefore, online security trading systems will be used as the study target in this research.

One possible reason for the inconsistency in the literature could be resulted from the lack of contingency factor in TAM. Some recent studies have suggested inclusion of contingency factors in TAM. For example, Agarwal & Prasad (1998) suggest that the contingency factor of personal innovativeness should be added to the relation between perceptions and adoption of decision systems. Personal innovativeness is the willingness of an individual to try out an innovation (Flynn & Goldsmith, 1993). Innovations are all potentially risky in the sense that consequences of using new information systems are unknown. That is, personal innovativeness reflects users' willingness to take risks. Based on this argumentation pointed by Agarwal & Prasad, two constructs relevant to personal risk-taking will be examined in this study as the

contingency factors, namely, reputation of the stock company and perceived risk of trading on line. Moreover, the factor of information quality and perceived costs are also tested. So the hypothetical model tested in this study is demonstrated as Figure 2.

The indexes of all the relevant variables are adapted from related studies.

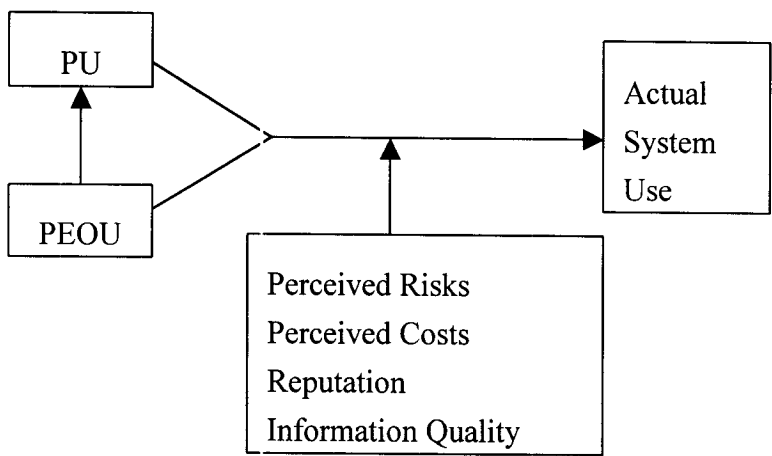


Figure 2: Revised Technology Acceptance Model

Customers of three online security trading companies were chosen to be our respondents for the questionnaire. An administration clerk in each of the three companies, who also mailed out the questionnaires directly to the respondents, randomly chose respondents for this research. The response rate was 18.76. Samples of these three companies were not different from each other (Levene test on homogeneity of variance,  $p<.686$ ; ANOVA test,  $p<.329$ ). So, the data of the three samples were collapsed together for further analysis.

Structural equation modeling and regression were used to test the hypothetical model in Figure 2. The reliability and validity of the dependent and independent variables were tested and all reached the required standards. The dependent variable was usage of the online security trading systems. And the independent variables were perceived usefulness, perceived ease of use, and the four proposed contingency factors. The results of structural equation modeling showed that perceived usefulness and perceived ease of use directly influenced usage (PU : .14,  $p < .05$ ; PEOU : .14,  $p < .05$ ). Moreover, perceived ease of use also had an impact on perceived usefulness (.35,  $p < .01$ ). Most importantly, perceived risks also directly affected usage behavior, with effect of .11 ( $p < .05$ ). Other factors (i.e. information quality, reputation and perceived costs) did not affect usage of the Internet as online security trading channel.

The contingency effect was tested through regress modeling of the interaction terms of the independents variables. In particular, the interaction terms of those four hypothetical contingency factors with PU and PEOU were examined. The results of regression showed that none of the interaction terms of the contingency factors with PEOU were significant. The interaction terms of perceived risks and information quality with PU were pretty close to significance (PU\*perceived risk, .12; PU\*information quality, .09). The results showed that perceived risk and information

quality could possibly serve as contingency factors that moderate the effect of perceived usefulness on usage.

## 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*, (16:2), 227-247.
- Agarwal, R. & Prasad, J. (1998) The antecedents and consequents of user perceptions information technology adoption, *Decision Support Systems*, (22:1) 15-29.
- Chau, P. Y. (1996) An empirical assessment of a modified technology acceptance model, *Journal of Management Information Systems* (13:2) 185-204.
- Davis, F. D. (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology, *MIS Quarterly* (13:3) 319-340.
- Fenech, T. (1998) Using perceived ease of use and perceived usefulness to predict acceptance of the World Wide Web, *Computer Networks and ISDN Systems*, 30, 629-630.
- Flynn, L. R. & Goldsmith, A. (1993) A validation of the Goldsmith and Hofacker innovativeness scale, *Educational and Psychological Measurement*, 53, 1105-1116.
- Hu, P. J. Chau, P. Y. Sheng, O. R. & Tam, K. Y. (1999) Examining the technology acceptance model using physician acceptance of telemedicine technology, *Journal of Management Information Systems* (16:2) 91-112.
- Lucas, H. C. & Spitler, V. K. Jr. (1999) Technology use and performance: A field study of broker workstations, *Decision Sciences* (30:2) 291-311.
- Straub, D. Limayem, M. & Evaristo, E. K. (1995) Measuring system usage: Implications for IS theory testing, *Management Science*, (41:8) 1328-1342.
- Szajna, B. (1996) Empirical evaluation of the received technology acceptance model, *Management Science*, (42:1) 85-92.