

A study of cloud computing affecting switch intentions of information service in junior and elementa

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ABSTRACT

Due to the fast growing of network environment, the needs of E-campus and E-learning are continues to increase. Taiwan ' s junior and elementary schools are facing the shortages of information technology (IT) specialists and funding. However, the cloud services are a solution to the problems. Because the information architecture, information literacy, organization characteristics and cultures are various from schools to schools, the cloud services are not an undoubted solution. The school technology coordinators have a lot of considerations to form traditional IT architecture switching to cloud services. This study was aimed at exploring the various factors, such as organization characteristics, the qualities of information system and the costs of switching information services that affected the intentions of switching. The school technology coordinators were the samples of this study. They were selected from 28 junior and 170 elementary schools of four counties in the central area of Taiwan by random sampling method. Empirical research method and questionnaire survey were applied in this study. It was found that the abilities of school ' s IT personnel and the qualities of IT system are positively significant influence on the intentions of switching cloud services. However, the costs of switching were having a negative effect and it plays an important moderate role for switching cloud services. Furthermore, the abilities of school technology coordinators, the information literacy of school teachers and the doubts about if the cloud services can integrate into existing information architecture of the school were the direct and indirect factors which affected the switching intentions. Therefore, it was suggested the businesses of cloud services should provide schools with various designs to meet their individual needs and to cut down the costs of switching. On the other hand, schools should promote the importance of information technology and increase the information literacy of teachers.

Keywords : Cloud Computing、Organization characteristics、Information System、Switching Cost、Switching Intention

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REFERENCES

- 一、中文部份 丁虹(1986),企業文化與組織承諾之關係研究,國立政治大學企業管理研究所未出版之博士論文。方國定、吳智鴻(1997),影響連鎖體系EDI擴散程度之實證研究,科技管理學刊,2(2),127-152。王慧萍(2006),顧客滿意、再購意願與購買行為之間的關聯研究 - 探討轉換成本與關係聯結的影響,高雄第一科技大學行銷與流通管理系未出版之碩士論文。江志卿、黃興進、嚴紀中(2005),中

小企業採用網路科技之比較:創新擴散通用模式的整合觀點,資訊管理學報,12(2),103-139。宋瑞盈(2007),慣性、轉換成本、競爭者吸引力及服務滿意度對轉換意願之影響-以行動電話服務產業為例,銘傳大學管理研究所未出版之碩士論文。李呈奇(2002),大學推動校園e化之探討,國立中山大學人力資源管理研究所未出版之碩士論文。李保成(1996),台灣地區企業採用網際網路之決策因素研究,國立中央大學企業管理研究所未出版之碩士論文。彼得 杜拉克,譯者:劉毓玲,典範轉移(原書名:二十一世紀的管理挑戰,Management Challenges for the 21st Century)(2005),台北:天下文化。林沅駿(2009),慣性與轉換成本在行動電話轉換意圖之角色,銘傳大學管理研究所未出版之碩士論文。林宗延(2005),行動電話服務轉換障礙對轉換意願之影響-以大台北地區為例,銘傳大學管理研究所未出版之碩士論文。林東清(1997),影響高階主管對資訊科技支持之關鍵因素研究,管理評論,7,23-43。林東清、許孟祥(1997),資訊管理調查研究方法探討,中華民國資訊管理學報,資訊管理實證研究方法研討會特刊,4(1),21-39。姜豐裕(2006),國民小學教師對校園e化環境滿意度之調查研究,國立臺南大學教育經營與管理研究所未出版之碩士論文。胡毓洳(2003),個人暨企業文化因素與企業知識分享之關係探討,國立成功大學企業管理研究所未出版之碩士論文。袁素萍(2003),企業轉型成功關鍵因素之研究,國立成功大學管理學院高階管理碩士在職專班未出版之碩士論文。張清雲(2005),企業採用資訊交換平台之影響因素-以國內投信及證券業為例,國立中央大學資訊管理研究所未出版之碩士論文。教育部中小學資訊教育白皮書2008-2011(2008),教育部[線上資料]來源:

http://www.edu.tw/files/site_content/B0010/97-100year.pdf [2011.01.14]. 莊文郁(2002),企業採用新資訊科技之影響因素研究-以ADSL為例,雲林科技大學資訊管理系未出版之碩士論文。陳巧佩(2001),企業導入顧客關係管理決策之研究,政治大學企業管理研究所未出版之碩士論文。陳美純(1995),影響企業策略與資訊科技策略連結因素之研究,第三屆國際資訊管理研究暨實務研討會論文集,389-396。陳緯航(2009),運算技術的另一片天空-雲端運算發展現況與應用趨勢,拓墣產業研究所焦點報告,寬頻網路通訊。雲端運算風暴來襲(上)(2008),數位時代[線上資料]來源: http://mag.udn.com/mag/digital/storypage.jsp?f_MAIN_ID=314&f_SUB_ID=2922&f_ART_ID=154209 [2011.01.14].

黃重憲(2009),淺談雲端運算,台大計中技術論壇[線上資料]來源: <http://mepopedia.com/forum/read.php?197,1111> [2011.01.14]. 楊孟泰(2002),彰化縣國民小學資訊組長工作現況、困境及改善途徑之研究,e世代創意教與學學術研討會論文集,23-24。葉瑞隆(2003),從組織創新採用觀點探討金融服務業導入行動銀行之決策準則,國立高雄第一科技大學資訊管理系未出版之碩士論文。運算在雲端:雲端服務園區(2009),台灣IDC [線上資料]來源:

[http://www.idc.com.tw/research/detail.jsp?id=MzE=\[2011.01.14\]](http://www.idc.com.tw/research/detail.jsp?id=MzE=[2011.01.14]). 廖銘珠(2007),醫療院所資訊系統成功模式之研究,國立東華大學企業管理學系未出版之碩士論文。劉欽宏(1991),影響企業採用新資訊科技關鍵因素之研究,國立政治大學企業管理研究所未出版之碩士論文。蔣麗君、蕭乃沂(2008),政府資訊人力與資訊預算之研究:現況、挑戰與因應。行政院研究發展考核委員會委託研究期中報告。蔡振昆(2001),傳統教學與網路教學之比較研究-從教學媒體、班級經營及教學評量來探討。國立中山大學資訊管理研究所碩士在職專班未出版之碩士論文。蔡瑜珍(2002),由組織的情境因素與組織特性探討教育行政管理資訊系統之研究,國立臺南師範學院國民教育研究所未出版之碩士論文。鍾明男(2009),雲端服務可獲利商業模式之探索性研究,國立臺灣科技大學資訊管理學系未出版之碩士論文。顏弘欽(2009),國民小學組織學習、組織創新與學校效能關係之研究,國立政治大學教育行政與政策研究所未出版之碩士論文。蘇郁琇(1999),台灣地區企業採用企業資源規劃系統之影響因素研究,國立台灣大學會計學研究所未出版之碩士論文。

二、英文部份 Aaker, D. A. (1992). The Value of Brand Equity. *Journal of Business Strategy*, 13, 27-32. Anderson, J. C. & Gerbing, D. W. (1998). Structural equation modeling in practice: a review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411-423. Anton, C., Camarero, C. & Carrero, M. (2007). Analysing Firms' Failures as Determinants of Consumer Switching Intentions: The Effect of Moderating Factors. *European Journal of Marketing*, 41(1/2), 135-158. Anton, C., Camarero, C. & Carrero, M. (2007). The Mediating Effect of Satisfaction on Consumers' Switching Intention. *Psychology & Marketing*, 24(6), 511 – 538. Bagozzi, R. P. (1993). Assessing construct validity in personality research: Applications to measures of self-esteem. *Journal of Research in Personality*, 27, 49-87. Bailey, J. E. & Pearson, S. W. (1983). Development of a Tool for Measuring and Analyzing Computer User Satisfaction. *Management Science*, 29(5), 530-545. Belardo, S., Karwan, K. R. & Wallace, W. A. (1982). DSS component design through field experimentation: an application to emergency management. *Proceedings of the Third International Conference on Information Systems*, 93-108. Bentler, P. M. & Bonett, D. G. (1980). Significance Tests and Goodness-of-Fit in the Analysis of Covariance Structures. *Psychological Bulletin*, 88, 588-600. Blackwell, R. D., Miniard, P. W. & Engel, J. F. (2001). Customer Behavior. New York: Dryden. Bruque, S. & Moyano, J. (2007). Organisational Determinants of Information Technology Adoption and Implementation in SMEs: The case of Family and Cooperative Firms. *Technovation*, 27(5), 241-253. Burnham, T. A., Frels, J. K. & Mahajan, V. (2003). Consumer Switching Costs: A Typology, Antecedents and Consequences. *Journal of the Academy of Marketing Science*, 31(2), 109-126. Byrd, T. A. & Turner, D. E. (2001). An exploratory analysis of the value of the skill of IT personnel: Their relationship to IS infrastructure and competitive advantage. *Decision Sciences*, 32(1), 21-54. Carlsson, F. & Lo"fgren, A*. (2006). Airline Choice, Switching Costs and Frequent Flyer Programmes. *Applied Economics*, 38, 1469-1475. Danmanpour, F. (1991). Organizational Innovation: A Meta-Analysis of Effects of Determinants and Moderators. *Academy of Management Journal*, 34(3), 555-590. DeLone, W. H. & McLean, E. R. (2003). The DeLone and McLean model of information systems success: a ten-year update. *Journal of Management Information Systems*, 19(4), 9-30. Doll, W. J. & Torkzadeh, G. (1988). The Measurement of End-User Computing Satisfaction. *MIS Quarterly*, 12(2), 259-274. Doll, W. J. (1995). A Confirmatory Factor Analysis of the User Information Satisfaction Instrument. *Information systems Research*, 6, 177-188. Erdogan, H. (2009). Cloud Computing: Does Nirvana Hide behind the Nebula? *Software, IEEE*, 26(2), 4-6. Evans, S. (2009). UK SMEs embrace cloud during recession: Survey[Online]. Available :

http://appdev.cbronline.com/news/uk_smes_embrace_cloud_during_recession_survey_230309 [2011, January 14]. Fornell, C. & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservables and Measurement Error. *Journal of Marketing Research*, 18(1), 39-50. Frambach, R. T. & Schillewaert, N. (2002). Organizational Innovation Adoption: A Multi-Level Framework of Determinants and Opportunities

for Future Research. *Journal of Business Research*, 55(2), 163-176. Gatignon, H. & Robertson, S. T. (1989). Technology Diffusion: An Empirical Test of Competitive Effects. *Journal of Marketing*, 53(1), 35-49. Gronroos, C., Heinonen, F., Isoniemi, K. & Lindholm, M. (2000). The Net Offer Model: A Case Example from the Virtual Marketspace. *ManagementDecision*, 38(4), 243-252. Grover, V. & Goslar, M. (1993). The Initiation, Adoption, and Implementation of Telecommunications Technologies in U.S. Organizations. *Journal of Management Information Systems*, 10(1), 141-163. Grover, V., Goslar, M. & Segars, A. (1995). Adopters of Telecommunications Initiatives: A Profile of Progressive US Corporations. *International Journal of Information Management*, 15(1), 33-46. Guiltinan, J. (1989). A Classification of Switching Costs with Implications for Relationship Marketing. Paper presented at the Proceedings of the AMA Winter Educators' Conference: Marketing Theory and Practice, 216-220. Hair, J. F., Anderson, R. E., Tatham, R. L. & Black, W. C. (1998). *Multivariate Data Analysis* (5th ed). Upper Saddle River, NY: Prentice Hall. Hamilton, S. & Chervany, N. L. (1981). Evaluating Information System Effectiveness: Part I. Comparing Evaluating Approaches. *MIS Quarterly*, 5(3), 55-69. Harrison, Allison, Rainer & Kelly, R. (1996). A General Measure of User Computing Satisfaction. *Computers in Human Behavior*, 12(1), 79-82. Heide, J. B. & Weiss, A. M. (1995). Vendor Consideration and Switching Behavior for Buyers in High-Technology Markets. *Journal of Marketing*, 59(July), 30-43. Hu, W. L. & Hwang, I. S. (2006). Measuring the Effects of Consumer Switching Costs on Switching Intention in Taiwan Mobile Telecommunication Services. *The Journal of American Academy of Business*, 9(1), 75-85. *Information age* (2010). European Union defines cloud computing[Online]. Available:

<http://www.information-age.com/channels/data-centre-and-it-infrastructure/news/1147048/european-union-defines-cloud-computing.shtml>[2011,January 14]. Ives, B., Olson, M. H. & Baroudi, J. J. (1983). The Measurement of User Information. *Communications of the ACM*, 26(10), 785-793. Jackson, B. B. (1985). Build Customer Relationships that Last, *Harvard Business Review*, 63(6), 120-128. James, Y. L. (1999). An integrated Model of information systems adoption in small business. *Journal of Management Information Systems*, 15(4), 187-214. Jones, M. A., Mothersbaugh, D. L. & Beatty, S. E. (2000). Switching Barriers and Repurchase Intentions in Service. *Journal of Retailing*, 76(2), 259-274. Keaveney, S. M. (1995). Customer Switching Behavior in Service Industries: An Exploratory Study. *Journal of Marketing*, 59(2), 71-82. Kettinger, W. J. & Lee, C. C. (1994). Perceived service quality and user satisfaction with the information service function. *Decision Sciences*, 25(5/6), 737-766. Khan, B. H. (1997). Web-based instruction(WBI):What is it and why is it ? In B. H. Khan(Ed.). *Web-based instruction*, 5-18. Kim, G., Shin, B. & Lee, H. G. (2006). A Study of Factors that Affect User Intentions toward Email Service Switching, *Information and Management*, 43(7), 884 – 893. Kim, M. K., Park, M. C. & Jeong, D. H. (2004). The Effects of Customer Satisfaction and Switching Barrier on Customer Loyalty in Korean Mobile Telecommunication Services, *Telecommunications Policy*, 28, 145 – 159. Klemperer, P. D. (1995). Competition When Consumer Have Switching Cost: AnOverview with Applications to Industrial Organization, Macroeconomics, and International Trade, *Review of EconomicStudies*, 62(4), 515-540. Langley, K. (2008). Cloud Computing: Get Your Head in the Clouds[Online]. Available :

<http://www.productionscale.com/home/2008/4/24/cloud-computing-get-your-head-in-the-clouds.html>[2011,January 14]. Lee, Y. W., Strong, D. M., Kahn, B. K. & Wang, R. Y. (2002). AIMQ: A methodology for information quality assessment. *Information & Management*, 42(2), 133-146. Lee, J. & Feick, L. (2001). The Impact of Switching Costs on the Customer-Loyalty Link: Mobile Phone Service in France, *Journal of Service Marketing*, 15(1), 35-48. Mak, B. L. & Sockel, H. (2001). A confirmatory factor analysis of IS employee motivation and retention. *Information and Management*, 38(5), 265-276. McGill, T., Hobbs, V. & Klobas, J. (2003). User-developed applications and information systems success: A test of DeLone and McLean model. *Information Resource Management Journal*, 16(1), 24-45. Mckinney, V., Yoon, K. & Zahedi, F. M. (2002). The measurement of web-customer satisfaction : an expectation and disconfirmation approach. *Information System Research*, 13(3), 296-315. Negash, S., Ryan, T. & Igbaria, M. (2003). Quality and effectiveness in Web-based customer support systems. *Information and Management*, 40, 757-768. Network World (2008). Cloud computing hype spurs confusion, Gartner says[Online]. Available:

http://www.computerworld.com/s/article/9115904/Cloud_computing_hype_spurs_confusion_Gartner_says[2010,January 14]. Nunnally, J. C. (1978). *Psychometric Theory* (2nd ed.). New York: McGraw-Hill. O ' Reilly, C. A., Chatman, B. J. & Caldwell, D. F. (1991). People and Organizational Culture: A Profile Comparison Approach to Assessing Person-Organization Fit. *Academy of Management Journal*, 34(3), 487-516. Parasuraman, A., Zeithaml, V. A. & Berry, L. L. (1988). ERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12-40. Pitt, L. F., Watson, R. T. & Kavan, C. B. (1995). Service Quality: A Measure of Information Systems Effectiveness. *MIS Quarterly*, 19(2), 173-188. Porter, M. E. (1980). *Competitive Strategy*. New York: Free Press. Premkumar, G. & Roberts, M. (1999). Adoption of new information technologies in rural small businesses. *The International Journal of Management Science*, 27, 467-484. Rai, A., Lang, S. S. & Welker, R. B. (2002). Assessing the Validity of IS Success Models: An Empirical Test and Theoretical Analysis. *Information System Research*, 13(1), 50-69 Rainer, R. K. & Watson, H. J. (1995). The Keys to Executive Information Systems Success. *Journal of Management Information Systems*, 12(2), 83-98. Ramamurthy, K. & Premkumar, G. (1995). Determinants and outcomes of electronic data interchange diffusion. *IEEE Transactions on Engineering Management*, 42(4), 332-351. Ranaweera, C. & Prabhu, J. (2003). The Influence of Satisfaction, Trust and Switching Barriers on Customer Retention in a Continuous Purchasing Setting. *International Journal of ServiceIndustry Management*, 14(4), 374-395. Raymond, L. (1985). Organizational Characteristics and MIS Success in the Context of Small Business. *MIS Quarterly*, 9(1), 37-52. Robbins, S. P. (2005). *Organizational behavior* (11th ed.). New Jersey: Prentice-Hall. Rogers, E. M. (2003). *Diffusion of innovations*. New York: The Free Press. Schiffman, L. G. & Kanuk, L. L. (2000). *Consumer Behavior* (7th ed.). New York: Prentice Hall Inc. Morton, S. M. (1991). *The Corporation of the 1990s:Information Technology and Organization Transformation*. Oxford University Press. Seddon, P. B. (1997). A Respecification and Extension of the DeLone and McLean Model of IS Success. *Information Systems Research*, 8(3), 240-253. Shin, D. H. & Kim,

W. Y. (2008). Forecasting Customer Switching Intention in Mobile Service: An Exploratory Study of Predictive Factors in Mobile Number Portability. *Technological Forecasting and Social Change*, 75(6), 854-874. Srinivasan, A. (1985). Alternative measures of system effectiveness: Associations and implications. *MIS quarterly*, 9(3), 243-253. Sultan, N. (2010). Cloud computing for education: A new dawn? *International Journal of Information Management*, 30(2), 109-116. Swanson, E. B. (1974). Management information systems: appreciation and involvement. *Management Science*, 21(2), 178-188. Thong, J. Y. L. & Yap, C. S. (1995). CEO Characteristics, Organizational Characteristics and Information Technology Adoptionin Small Businesses. *Omega-International Journal of Management Science*, 23(4), 429-442. Thong, J. Y. L. (1999). An Integrated Model of Implementation Systems Adoption in Small Businesses. *Journal of Management Information Systems*, 15(4), 187-214. Tu, Q., Vonderembse, M. A. & Ragu-Nathan, T. S. (2001). The impact of time-based manufacturing practices on mass customization and value to customer. *Journal of Operations Management*, 19(2), 201-217. Vincent, S. L. (1997). Critical Factors of ISDN Implementation:An Exploratory Study. *Information and Management*, 33, 87-97. Wallanch, E. J.(1983). Individuals and Organizations: The Cultural Match. *Training and Development Journal*, 37(2), 29-37. Weill, P. & Olson, M. H. (1989). Managing Investment in Information Technology: Mini Case Examples and Implications. *MIS Quarterly*, 13(1), 3-17. Whitten, D., Chakrabarty, S. & Wakefield, R. (2010). The strategic choice to continue outsourcing, switch vendors, or backsource: Do switching costs matter? *Information & Management*, 47(3), 167-175. Wixom, B. H. & Todd, P. A. (2005). A theoretical integration of user satisfaction and technology acceptance. *Information Systems Research*, 16(1), 85-102. Yap, C. (1990). Distinguishing Characterisitis of Organization using Computers. *Information and Management*, 18(2), 97-107. Zmud, R. W. (1984). Design Alternatives for Organizing Information Systems Activities. *MIS Quarterly*, 8(2), 79-93.