

# Factors affecting the adoption of cloud computing:a fuzzy AHP analysis

白牧政、林清同

E-mail: 343626@mail.dyu.edu.tw

## ABSTRACT

Since the launch of a successful cloud computing vendors to attract pay close attention, Web2.0 has been considered is the second after, The next wave of industry important opportunity. For cloud computing vendors currently there are still many doubts, Will indirectly affect the use of. previous studies for public and private cloud to identify key factors affecting both types, Important factor for the sort used to explore less, Suppliers are expected to improve through the key factors, Enhance the value of their own cloud services, Order to find the weights between factors become important issues. The study was approved 21 domestic manufacturers of high-level electronics industry experts, Fuzzy AHP systematic analysis, previous studies of the defects and improve the demand. Study found Executives to support , the market competitive advantage, achieve business objectives, security, and partner requirements ,Six critical factors that influence. Therefore, Cloud computing service providers to give priority access to senior management support , Second, Cloud computing services can be adjusted in line with company needs, Security and stability of two issues with other vendors Cooperation, Users and suppliers to achieve reciprocal beneficiary relationship.

Keywords : cloud computing、 Fuzzy Analytical Hierarchy Process(FAHP)

## Table of Contents

中文摘要	iii	英文摘要	iv
誌謝辭	v	內容目錄	vi
目錄	viii	圖目錄	ix
第一章 緒論	1	第一節 研究背景與動機	1
第二節 研究目的	3	第三節 研究流程	4
第二章 文獻探討	7	第一節 雲端運算	7
企業採用科技考量因素	14	第二節 雲端策略	18
層級分析法	18	第三節 雲端應用	26
模糊層級分析法	32	第四章 實證分析	37
評估架構	37	第一節 研究背景	41
一致性檢定	42	第二節 樣本分析	41
結論	53	第三節 指標權重分析	45
管理意涵	57	第五章 第一節 研究發現	53
後續研究建議	58	第二節 研究範圍與限制	58
測問卷	69	參攷文獻	59
		附錄A 前	
		附錄B 模糊層級問卷	72

## REFERENCES

- 一、中文部份 維基百科(2010), 雲端運算[線上資料], 來源: <http://zh.wikipedia.org/zh-tw>[2010, September 27]。財團法人資訊工業策進會產業情報研究所(2010), 來源: <http://mic.iii.org.tw>[2010, September 02]。陳滢(2010), 雲端策略。台北:天下雜誌。王鵬(2009), 走進雲端運算。台北市:佳魁資訊股份有限公司。林佳瑜(2009)。雲端運算:改變線上工作與合作模式的網路式應用, 台北市:碁峰資訊股份有限公司。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系在職專班未出版之碩士論文。蕭瑞祥, 黃獻輝(2009)雲端運算於企業應用之研究, 發表於第十四屆資訊管理暨實務研討會, 台北市。許孟祥, 黃博信, 張兆翔(2009)探討雲端計算對企業商業模式之衝擊:以Google、Amazon及趨勢科技為例, 國立高雄科技大學資訊管理學系未出版碩士論文。雷亞珍(2008), 從資源依賴理論之成本控制觀點探討企業資訊服務創新採用雲端運算「軟體即服務(SaaS)」之研究 - 以新竹科學園區廠商為例, 國立交通大學為未出版碩士論文。鄧振源, 曾國雄(1989)層級分析法AHP的內涵特性與應用(上), 中國統計學報, 27(6), 5-22。鄧振源, 曾國雄(1989), 層級分析法AHP的內涵特性與應用(下), 中國統計學報, 27(7), 1-20。林信亨, 翁偉修(2009), Amazon.com雲端運算服務發展動態分析, 財團法人資訊工業策進會產業情報研究所。林信亨(2009)。Google發展雲端運算服務之策略分析, 財團法人資訊工業策進會產業情報研究所。林信亨(2009), IBM發展Blue Cloud之策略意涵, 財團法人資訊工業策進會產業情報研究所。翁偉修、王義智、林信亨、李震華、黃正傑、洪聖敏 (2009), 雲端運算趨勢下台灣資訊產業之機會與策略, 財團法人資訊工業策進會產業情報研究所。翁嘉德、朱南

勳(2009), 行動雲端運算創新應用趨勢探索-大廠觀察(上), 財團法人資訊工業策進會產業情報研究所。翁嘉德、朱南勳(2009), 行動雲端運算創新應用趨勢探索-大廠觀察(下), 財團法人資訊工業策進會產業情報研究所。林俊儒(2010), 雲端運算趨勢下我國產業之機會, 台北市:行政院經濟建設委員會。鐘嘉德, 高天助, 楊嘉栩(2010), 雲端運算與產業發展, 研考雙月刊, 34(4)。林育震(2010), 掌控風險發揮雲端效益, *Communications of the CCISA*, (16)4。彭康桓(2008), 雲端運算智慧服務策略之研究, 國立交通大學管理學院碩士在職專班管理科學組未出版論文。高秀娟(2008), 雲端運算之CRM服務, 國立交通大學管理學院碩士在職專班管理科學組未出版論文。柯宜伶(2008), 雲端運算之網路儲存服務, 國立交通大學管理學院碩士在職專班管理科學組未出版論文。李保成(1998), 台灣地區企業採用網際網路之決策因素, 中央大學資訊管理研究所碩士未出版論文。林士傑(1999), 企業採用Intranet(企業網路)之成功關鍵因素研究, 中原大學企業管理系碩士未出版論文。許碩博(1999), 影響企業採用內部網路(intranet)的因素及效益研究, 淡江大學資訊管理研究所未出版碩士論文。黃振中、戴克元, 影響國內金融電子商務推動之環境因素, 第10屆國際資訊管理學術研討會, 349-356。張力仁(2001), 影響中小企業管理者導入電子商務因素之研究, 東華大學國際企業研究所未出版碩士論文。陳仁康(2001), 推行企業外部網路(Extranet)的成功因素及其效益之研究, 淡江大學資訊管理研究所碩士未出版論文。賴文樹, 企業採用電子商店決策因素與實施現況之研究, 大葉大學資訊管理研究所未出版碩士論文。

二、英文部分: Aymerich, F. M., Fenu, G., & Surcis, S.(2008). An approach to a cloud computing network. *Proceedings of the First International Conference on the Applications of Digital Information and Web Technologies*, 113-118. Buyya R., C. Yeo, S. S. Venugopal, J. Broberg, and I.Brandic.(2009). Cloud Computing and Emerging IT Platforms: Vision, Hype, and Reality for Delivering Computing as the 5th Utility. *Future Generation Computer Systems*, 25(6), 599-616. Buyya, R., Yeo, C. S., and Venugopal, S. (2008). Market-oriented cloud computing: Vision, hype, and reality for delivering IT services as computing utilities. *Proceedings of the 10th International Conference on High Performance Computing and Communications*, 5-13. Buckley J. J. (1985). Fuzzy hierarchical analysis, *Fuzzy Sets and Systems*, 17(3), 233 – 247. Chau, P.Y.K., Tam, K.Y. (1997). Factors affecting the adoption of open systems: an exploratory study. *MIS Quarterly*, 21(1), 1-24. Chunye Gong, J. L., Zhang Q., Chen H. & Gong Z.(2010). The Characteristics of Cloud Computing, 39 *International Conference on Parallel Processing Workshops*. Erdogmus, H. (2009). Cloud Computing: Does Nirvana Hide behind the Nebula?, *IEEE Software*, 26(2), 4 – 6. Foster, I., Zhao, Y., Raicu, I., & Lu, S. (2008). Cloud computing and grid computing 360-degree compared. *Proceedings of the Grid Computing Environments Workshop*, 1-10. Hsin-Pin Fu (2006). Factors affecting the adoption of electronic marketplaces. *International Journal of Operations & Production Management*, 26(12) 1301-1324. Hsin-Pin Fu (2008). The impact of market freedom on the adoption of third-party electronic marketplaces. *Industrial Marketing Management*, (37), 698-712. Immermann, H. J., Zadeh, L. A., & Gaines, B.R. (1984). *Fuzzy Sets and Decision Analysis*. Iacovou, C. L., Benbasat, I. and Dexter, A. (1995). Electronic data interchange and small organizations: Adoption and impact of technology. *MIS Quarterly*, 19(4), 465-485. Kuan, K. K. Y., Chau, P. Y. K. (2001). A perception-based model for EDI adoption in small businesses using a technology-organization-environment framework. *Information & Management*, 38(8), 507-521. Kuan, K. K. Y., Chau, P. Y. K. (2001). A perception-based model for EDI adoption in small businesses using a technology-organization-environment framework. *Information & Management*, 38(8), 507-521. Kuo, Y. F., Wu, C.M., & Deng W. J. (2009). The relationships among service quality, perceived value, customer satisfaction, and post-purchase intention in mobile value-added services, *Computers in Human Behavior*, 25(4), 887 – 896. Looi, H.C. (2005). E-commerce adoption in Brunei Darussalam: a quantitative analysis of factors influencing its adoption. *Communication of the Association for Information Systems*, 15(3), 61-81. Laarhoven, P.J.M. & Pedrycz, W. (1983). A Fuzzy Extension of Saaty's priority theory, *Fuzzy Sets and Systems*, (11)3, 229-241. Lin, H.F., Lin, S.M. (2008). Determinants of e-business diffusion: A test of the technology diffusion perspective. *Technovation*, 28(3), 135-145. McBride, N.(1997). Business Use of The Internet: Strategic Decision or Another Bandwagon. *European Management Journal*, 15(1), 58-67. Opounidis, C., & Documpos, M. (1998). Developing a multicriteria decision support system for financial classification problems: The finclas system. *Optimization Methods and Software*, 8, 277-304. Ramamurthy, K. and Premkumar, G.(1995). Determinants and Outcomes of Electronic Data Interchange Diffusion. *IEEE Transactions on Engineering Management*, 142(4), 332-351. Rosenthal, A., Mork, P., Li, M. H., Stanford, J., Koester, D., & Reynolds, P. (2009). Cloud computing: A new business paradigm for biomedical information sharing, *Journal of Biomedical Informatics*, 43(2), 342-353. Saaty, T. L. 1980. *The Analytic Hierarchy Process*, McGraw-Hill Inc.. Sultan, N. (2010). Cloud computing for education: A new dawn?, *International Journal of Information Management*, 30, 109 – 116. Subashini S. n and Kavitha V. (2010). A survey on security issues in service delivery models of cloud computing *Journal of Network and Computer Applications*, 2. Wang, Z., & Xu, X. (2009). SVLC: Service Value Life Cycle Model, *IEEE International Conference on Cloud Computing*. 159-166. Teo, T.S.H., Ranganathan, C., Dhaliwal, J. (2006). Key dimensions of inhibitors for the deployment of web-based business-to-business electronic commerce. *IEEE Transactions on Engineering Management*, 53(3), 395-411. Thong, J.Y.L. (1999). An integrated model of information systems adoption in small business. *Journal of Management Information Systems*, 15(4), 187-214. Zhu, K., Kraemer, K., and Xu, S. (2003). Electronic business adoption by European firms: a cross-country assessment of the facilitators and inhibitors. *European Journal of Information Systems*, 12(4), 251-268. Zhu, K., Kraemer, K.L. (2005). Post-Adoption Variations in Usage and Value of E-Business by Organizations: Cross-Country Evidence from the Retail Industry. *Information Systems Research*, 16(1), 61-83. Zadeh L.A. (1965). Fuzzy sets, *Information and Control*, 8, 338-353. Zadeh, L. A. (1975a). The concept of a linguistic variable and its application to approximate reasoning-I, *Information Science*, 8(3), 199-249. Zadeh, L. A. (1975b). The concept of a linguistic variable and its application to approximate reasoning-II, *Information Science*, 8(4), 301-357. Zadeh, L. A. (1975c). The concept of a linguistic variable and its application to approximate reasoning- III, *Information Science*, 19(1), 43-80. Zhang S. Zhang S, Chen X, and Huo X. (2010). Cloud Computing Research and Development Trend, *Second International Conference on Future Networks*.