

# R&D internationalization and organizational creativity : the moderating role of adaptation of HQ tec

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## ABSTRACT

Owing to the competitive situation of globalization, enterprises are facing the competition and challenges stricter than past decade. The Enterprises not only have accepted the rapid change of market demand but also the shorter product life, so as to survive among the competitors all over the world. The existence of economic activities is for solving supply-demand problem. For the purpose of solving the supply and demand problem, promoting industrial activities, many production management theorems have been developed from past to present. Without information system, these theorems are useless. In order to strengthen the position in the competitive market, most enterprises have started to make plans and investments to implement ERP system. Even if most enterprises in Taiwan have recognized the benefits of implementing ERP system, they are seeking continuously for more efficient way to successfully implement the system. The challenges all the top-levels are facing the problem which is how to adopt ERP system and operate it successfully. Another question is how to deeply enhance company ' s capability and competitiveness by the effectiveness attributes to this introduction. Therefore, the evaluation of ERP system has been an extremely concerned issue for a long time since it was introduced. This research focuses on the manager, the informatics, and the user performing a questionnaire survey which aims to two main layers of pre-implementation and post-implementation of ERP systems. The purpose of this research aims to conclude and summarize possible key factors which effect pre-implementation and post-implementation of ERP system. Then, taking good control of these factors with a view which integrates enterprise ' s internal resource and operating ERP system effectively and speedily. Due to the reason of the restricted resource, this paper suggests a consideration of critical key successful factors for these enterprises.

Keywords : Enterprise Resource Planning (ERP)、Critical Success Factors、Questionnaire Process

## Table of Contents

中文摘要	i
ABSTRACT	ii
誌謝	iv
目錄	v
表目錄	vii
圖目錄	x
第一章 緒論	1
1.1 研究動機與背景	1
1.2 研究目的與方法	2
1.3 研究範圍與限制	2
1.4 論文流程	3
第二章 文獻探討	5
2.1 企業資源規劃系統 (ERP)定義與源起	5
2.2 企業導入ERP系統的型態	6
2.3 ERP系統的評估重點	6
2.4 ERP系統的導入步驟	7
2.5 企業導入ERP系統的成效	8
2.6 ERP系統導入關鍵成功因素	10
第三章 研究方法	12
3.1 個案公司介紹	12
3.2 資訊系統評估	14
3.2.1 資訊系統成功模型	14
3.2.2 資訊系統成功模型之各構面彙整	16
3.4 研究變數定義與衡量	23
3.5 個案公司ERP系統導入流程	32
3.5.1 戴明循環 PDCA	32
3.5.2 個案公司導入流程	32
3.6 問卷內容設計與衡量	35
第四章 資料分析與結果	47
4.1. 發放對象	47
4.2 問卷回收	47
4.3 樣本特性描述與分析 (主管)	47
4.3.1 個案A公司之主管樣本基本資料描述	47
4.4 樣本特性描述與分析 (資訊人員)	50
4.4.1 個案A公司之資訊人員樣本基本資料描述	50
4.5 樣本特性描述與分析 (使用人員)	53
4.5.1 個案A公司之使用人員樣本基本資料描述	53
4.6 ERP系統量表變數之描述統計	56
4.6.1 部門主管	56
4.6.2 資訊人員	60
4.6.3 使用人員	64
4.7 信度(reliability)檢定	68
4.7.1 主管	69
4.7.2 資訊人員	69
4.7.3 使用人員	69
4.8 因素分析 (Factor Analysis)	70
4.8.1 部門主管	71
4.8.3 使用人員	72
4.9 因素分析結果	72
4.9.1 主管	72
4.9.2 資訊人員	76
4.9.3 使用人員	80
4.10 各群組背景對各研究變數之交叉分析	84
4.10.1 交叉分析_主管	84
4.10.3 交叉分析_使用人員	101
第五章 結論與建議	112
5.1 結論	112
5.1.1 主管	112
5.1.2 資訊人員	113
5.1.3 使用人員	114
5.2 後續研究建議	115
參考文獻	116
附錄一 問卷內容 (主管)	119
附錄二 問卷內容 (資訊人員)	119
附錄三 問卷內容 (使用人員)	119
附錄四 問卷內容 (個人背景資料)	119

## REFERENCES

- 英文文獻 [1]Agarwal, R., and Prasad, J., 1999, "Are individual differences germane to the acceptance of new information technologies?" *Decision Sciences*, 30(2), pp. 361-391.
- [2]Anonymous, 1999, "What Purchasing Need to Know before Selecting An ERP System," *Purchasing*, Oct. 21, pp. 76.
- [3]APICS Dictionary Edition 8.
- [4]Arnold, Vicky, 1995, "Discussion of an Experimental Evaluation of Measurements of Information System Effectiveness," *Journal of Information Systems*, vol. 9, pp. 85-91.

- [5]Bailey, J. E. and S. W. Pearson, 1983, "Development of a Tool for Measuring and Analyzing Computer User Satisfaction", *Management Science*, Vol. 29, pp. 530-545.
- [6]Bancroft, N. H. and Seip, H., 1998, "Implenting SAP R/3", Greenwich Manning.
- [7]Barua, A., C. H. Kriebel, and T. Mukhopadhyay, 1995, "Information Technologies and Business Value: An Analytical and Empirical Investigation", *Information System Research*, pp. 3-23.
- [8]Benbasat, Izak and Albert S. Dexter, 1986, "An Investigation of the Effectiveness of Color and Graphical Information Presentation Under Varying Time Constraints," *MIS Quarterly*, pp. 59-81.
- [9]Bhattacharjee, A., 2001, Understanding Information Systems Continuance: An Expectation Confirmation Model, *MIS Quarterly*, pp. 351-370.
- [10]Bingi P., Sharma M.K., Godla and Jayanth K., 1999, "Critical Issues Affecting an ERP Implementation," *Information System Management*, Vol. 16, Iss. 5, pp. 7-14.
- [11]Boudreau, M.C., 2003, "Learning to use ERP technology: A causal model," *Proceedings of 36th Annual Hawaii International Conference on System Sciences*, pp. 235-243.
- [12]Brown, Robert M. and Amy W. Gatian, 1995, "Strategic Information Systems and Financial Performance," *Journal of Management Information Systems*, vol. 11, pp. 215-248.
- [13]Brynjolfsson, E. and Hitt. L., 2000, "Beyond computation: Information Technology, organization transformation and business performance," *Journal of Economic Perspectives*.
- [14]Chen, Lei-da, Khalid S. Soliman, and Mark N. Frolick, 2000, "Measuring User Satisfaction with Data Warehouses: An Exploratory Study," *Information & Management*, pp. 103-110.
- [15]Cooper, J. C., 1993, "Logistics Strategies for Global Business", *International Journal of Physical Distribution and Logistics Management*, Vol. 23, pp. 12-23.
- [16]Crossan, M. M., Lane, H. W., & White, R. E., 1999, An Organizational learning framework: From intuition to institution. *Academy of Management Review*, pp. 522-537.
- [17]Daniel J. Paulish, 2003, *Architecture-Centric Software Project Management- A Partical Guild*.
- [18]Davenport, T. H., 1998, "Puitting the Enterprise into the Enterprise System", *Harvard Business Review*, pp. 124.
- [19]Davenport, Thomas H. & Short, James E., 1990, "The New Industrial Engineering Information Technology and Business Process Redesign", *Sloan Management Review*, Vol. 31, pp. 11-27.
- [20]Davis, F.D., Bagozzi, R.P., & Warshaw P.R., 1989, "User acceptance of computer technology: A comparison of two theoretical models," *Management Science*, pp. 982-1003.
- [21]Davis, Fred D., 1989, "Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology," *MIS Quarterly*, pp. 319-340.
- [22]Davis, G. J., 1985, " A typology Management Information Systems Users and Its Implications for User of Management Information System Information Satisfaction Research," *Communications of the ACM*, Vol. 85, pp. 152-164.
- [23]DeLone, W. H., and McLean, E. R., 1992, "Information Systems Success: The Quest for the Dependent Variable", *Information System Research*, Vol. 3, pp. 60-95.
- [24]DeLone, W. H., and McLean, E. R., 2003, "The DeLone and McLean Model of Information Systems Success A Ten-Year Update", *Journal of Management Information Systems*, Vol. 19, pp. 9-30.
- [25]Doll, William J. and Gholamreza Torkzadeh, 1988, "The Measurement of End-User Computing Satisfaction," *MIS Quarterly*, pp. 295-274.
- [26]Etezadi-Amoll, Jamshid and Ali F. Farhoomand, 1996, "A Structural Model of End User Computing Satisfaction and User Performance," *Information & Management* 30, pp. 65-73.
- [27]Fenner, G. H., and Renn, R. W., 2004, Technology-assisted s definition and a research framework," *HumanRes*, pp. 179-200.
- [28]Gartner Group, Dataquest, 1999, *ERP Software Publishers: Service Strategies and Capabilities*.
- [29]Gary Forger, 2000, "ERP Goes Mid-Market", *Modern Material Handling*, pp. 65-71.
- [30]Gattiker, T. F. and D. Goodhue, 2005, "What Happens After ERP Implementation: Understanding the Impact of Interdependence and Differentiation on Plant-level Outcomes," *MIS Quarterly*, pp. 559-585.
- [31]Goodhue, Dale L. and Thompson, R. L., 1995, "Task-Technology Fit and Individual Performance," *MIS Quarterly*, pp. 213-236.
- [32]Goodhue, Dale L., 1998, "Development and Measurement Validity of a Task-Technology Fit Instrument for User," *Decision Science*, pp. 105-138.
- [33]Grassian, Esther, 2000, "Thinking Critically about World Wide Web Resources," [34]Harry H. Brakely III , 1999, "What Makes ERP Effect," *Manufacturing System*, Mar, pp. 120-121.
- [35]Hartwick, J., and Barki, H., 1994, "Explaining the Role of User Participation in Information System Use," *Management Science*, pp. 440-465.
- [36]Henry Alex, 1999, "Seven Key Element of A Successful Implementation, and Eight Mistakes You Will Make Anyway", *Hospital Material Management Quarterly*, pp. 76-82.
- [37]Hitt, Lorin M. and Erik Brynjolfsson, 1996, "Productivity, Business Profitability, and Surplus: Three Different Measures of Information

Technology Value," MIS Quarterly, pp. 121-140.

[38]Holland C. and Light B., 1999, " A Critical Success Factors Model for ERP Implementation " , IEEE Software, Vol.16, pp. 30-36.

[39]Holland C. and Light B., 1999, " A Critical Success Factors Model for ERP Implementation " , IEEE Software, Vol.16, pp. 120-121.

[40]Hussain D.S., Hussain, K.M., 1984, "Managing Resistance to change: Information: an organizational fit perspective", Irin Manage.,

[41]Illa, X. B., X. Franch and J. A. Pastor, 2000, "Formalising ERP Selection Criteria", IEEE Computer Society, pp. 115-122.

[42]Ives, B., Olson, M., and Baroudi, J., 1983, "The measurement of user informationsatisfaction," Communications of the ACM, pp. 785-790.

[43]Jacobs, F. R. and E. Bendoly , 2003, "Enterprise Resource Planning: Developments and Directions for Operation Management Research," European Journal of Operation Research, 146(2), pp. 233-240.

[44]Jasperson, S., P. E. Carter, and R. Zmud, 2005, "A Comprehensive Conceptualization of Post-adoptive Behaviors Associated With Information Technology Enabled Work Systems," MIS Quarterly, 29(3), pp.525-557.

[45]Jarvenpaa, S. L. and Staples, D.S., 2000, "The use of collaborative electronic media for information sharing: An exploratory study of determinants " , Journal of Strategic Infomraiton System, pp. 54-129.

[46]Kale, Vivek , 2000, Implementing SAP/R3- The Guide for Business and Technology Mangers, SAMS Publishing, January.

[47]Katz, Adolph I., 1993, "Measuring Technology ' s Business Value," Information Systems Management, vol. 10, pp. 33-39.

[48]Kay, R. H., 1993, "An exploration of theoretical and practical foundation for assessing attitudes towards computers: The computer attitude measure," Computers in Human Behavior, pp. 371-386.

[49]Kettinger,W.J. and Grover,V., 1995, "Toward a Theory of Business Process Change", Journal of Management information Systems, pp. 9-30.

[50]Kole, M.A., 1983, "Going Outside for MIS Implementation", Information & Management, pp. 261-268.

[51]Langenwalter, G. A., 2000, Enterprise Resources Planning and Beyond Integrating Your Entire Organization " , CRC/APICS Press. New York.

[52]Leidner, Dorothy E. and Joyce J. Elam, 1994, "Executive Information Systems: Their Impact on Executive Decision Making," Journal of Management Information Systems, vol. 10, pp. 139-153.

[53]Lucas Jr., Henry C., 1981, "An Experimental Investigation of the Use of Computer-Based Graphics in Decision Making," Management Science, vol. 27, pp. 757-768.

[54]Mahmood, M. A. and Medewitz, J. N., 1985, "mpact of Design Methods on Decision Support System Success:An Empirical Assessment," Information & Management, Vol. 2, pp. 37-64.

[55]Mahmood, M. A., 1987, "System Development Methods -- A Comparative Investigation," MIS Quarterly, Vol. 11, pp. 293-311.

[56]Marlene Pituroo, 1999, "How Midsize Companies Are Buying ERP," Journal of Accountancy, pp. 41-48.

[57]Masseti, Brenda and Robert W. Zmud, 1996, "Measuring the Extent of EDI Usage in Complex Organizations: Strategies and Illustrative Examples," MIS Quarterly, pp. 331-345.

[58]Millman, Zeeva and Jon Hartwick, 1987, "The Impact of Automated Office Systems on Middle Managers and their Work," MIS Quarterly, pp. 479-491.

[59]Mirani, Rajesh and Albert L. Lederer, 1998, "An Instrument for Assessing the Organizational Benefit of IS Projects," Decision Sciences, vol. 29, pp. 803-838.

[60]Nah, F. F. H., Faja, S., and Cata, T., 2001, "Characteristics of ERP software maintenance: Amultiple case study, "Journal of Software Maintenance and Evolution: Research and Practice, pp. 399-414.

[61]Nolan, R. L., 1979, "Managing the crises in data processing," Harvard Business Review, pp. 115-126.

[62]Nonaka, I. 1994, "A Dynamic Theory of Organizational Knowledge Creation," Organization Science, pp. 14-37.

[63]O'Brien, J. A., 1979, "Computer Management and Society", Computer in Business Management, Irin Inc.

[64]O'Brien, J. A., 2002, Management Information System: Technology in the e-business enterprise, 5th ed. Mcgraw-Hill Education.

[65]Oliver, R. W. , 1999, "ERP is dead, long live ERP," Management Accouting, pp. 20-27.

[66]Omar, M. H. and D. N. Lascu, 1993, "Development of a User Information Satisfaction Scale: An Alternative Measure with Wide Applicability," Journal of Information Technology Management, Vol.4, pp. 1-13.

[67]Ortiz, A., F. Lario, and L. Ros, 1999, "Enterprise integration - Business process integrated management: a proposal for a methodology to develop enterprise integration programs," Computers in Industry, pp. 155-171.

[68]Parr, A. and G. Shanks, 2000, "A model of ERP project implementation," Journal of Information Technology, pp. 289-303.

[69]Parr, Gerard and Kevin Curran, 2000, "A Paradigm Shift in the Distribution of Multimedia," Communication of ACM, pp. 103-108.

[70]Perry A. Trunick, 1999, "ERP: Promise or Pipe Dream," Transportation & Distribution, pp. 23-26.

[71]Pitt, L. F. and Watson, R. T. and Kavan, C. B., 1995, "Service Quality: A Measure of Information System Effectiveness", MISQuarterly, pp. 173-185.

[72]Prasad Bingi and Maneesh K. Sharma, 1999, "Critical Issues Affecting An ERP Implementation," Information System Management, Summer, pp.7-14.

[73]Pressman, Roger S., 1983, Software Engineering: A Practitioner ' s Approach 2nd Printing. (Taipei, Taiwan: Central Book Company.)

- [74]Saleem, Naveed, 1996, "An Empirical Test of the Contingency Approach to User Participation in Information Systems Development," Journal of Management Information Systems, vol. 13, pp. 145-166.
- [75]Sanders, G. Lawrence and James F. Courtney, 1985, "A Field Study of Organizational Factors Influencing DSS Success," MIS Quarterly, pp. 77-93.
- [76]Senn, James A., 1986, Analysis and Design of Information Systems 2nd Printing, Singapore: McGraw-Hill Book Co.
- [77]Shah, Y.M., 1990, "Understanding Client-Consultant Interaction," Cost Engineering, pp. 15-22.
- [78]Sigwart, Charles D., Gretchen L. Van Meer, and John C. Hansen, 1990, Software Engineering: A Project Oriented Approach. (Irvine, California: Franklin, Beedle, & Associated, Inc.)
- [79]Singleton, John P., Ephraim R. McLean, and Edward N. Altman, 1988, "Measuring Information Systems Performance: Experience with the Management by Results System at Security Pacific Bank," MIS Quarterly, pp. 325-337.
- [80]Soliman, K.S. and B. D. Janz, 2004, "An Exploratory Study To Identify The Critical Factor Affecting the Decision To Establish Internet-based Interorganizational Information Systems", Information & Management,41(6), pp. 697-706.
- [81]Srinivasan, Ananth, 1985, "Alternative Measures of System Effectiveness: Associations and Implications," MIS Quarterly, pp. 243-253.
- [82]Stephen J. Wall, 1998, "Wall to Wall Change", Across The Board, pp. 32-38.
- [83]Stephen, J.M., 2000, "Keeping up with ERP," Machine Design, pp. 56-60.
- [84]Steven M. Glover, 1999, "Implementing ERP," Internal Auditor, Feb, pp.40-47.
- [85]Steward, Donald V., 1987, Software Engineering with Systems Analysis and Design, Monterey. California: Brooks/ Cole Publishing Company.
- [86]Szajna, Bernadette and Richard W. Scamell, 1993, "The Effects of Information System User Expectations on their Performance and Perceptions," MIS Quarterly, pp. 493-516.
- [87]Thomas H. Davenport, 1998, "Putting The Enterprise into The Enterprise System," Harvard Business Review, pp. 121-131.
- [88]Thomas H. Davenport, 2002, "Mission Critical: Realizing the Promise of Enterprise Systems".
- [89]UWEC McIntyre Library, 2000, "Ten C's for Evaluating Internet Sources," .
- [90]Wallace, M. J., 1982, Human Resource: An introduction to the profession, New York: Random House.
- [91]Wolti, Norbert 1992, "The Relationship between Investment in Information Technology and Firm Performance: A Study of the Value Manufacturing Sector", Information System Research, pp. 307-333.
- [92]Woodroof, J., and Burg, W., 2003, "Satisfaction/dissatisfaction: are users predisposed?", Information and Management, Vol. 40, No. 4, pp.317-324, March.
- [93]Yuthas, Kristi and Martha M. Eining, 1995, "An Experimental Evaluation of Measurements of Information System Effectiveness," Journal of Information Systems, pp. 6984.
- [94]Zmud, R. W., 1978, "An Empirical Investigation of the Dimensionality of the Concept of Information", Decision Sciences, Vol. 9, pp. 187-195.
- 中文文獻 [1]尤錫銘, 2007, 企業導入ERP後對員工工作滿意影響之研究, 南台大學, 碩士論文。
- [2]王天津, 張宗翰, 王詩華, 2004, "應用模糊多準則決策於ERP系統軟體供應商評選之研究", 電子商務學報, 6卷, 1期, 頁11~26
- 。
- [3]王俊程, 江明錦, 2009, "促進拍賣社群成員持續互動之整合模式:結合滿意度與社會構面因素", 電子商務學報, 11卷, 1期, 頁119~142。
- [4]朱斌好, 黃仟文, 翁少白, 2008, "以科技接受模式探討即時交通資訊系統之使用意願", 電子商務學報, 10卷, 1期, 頁367~394
- 。
- [5]吳建明, 林尚平, 湯大緯, 李純誼, 2008, "資訊系統「後導入階段」使用慣例的個案研究", 台大管理論叢, 19卷, 1期, 頁213~240。
- [6]吳瑞明, 2002, ERP系統使用者滿意度之關鍵因素研究 - 以K公司為例, 大同大學, 碩士論文。
- [7]呂執中, 陳平舜, 傅翰祺, 林宜靜, 2008, "供應鏈協同作業模式應用與個案研究", 電子商務學報, 10卷, 4期, 頁941~962。
- [8]李國璋, 蔡明田, 莊立民, 許惠雯, 2009, "ERP導入後影響企業電子化成效因素之探討系統維護與回饋之中介效果", 電子商務學報, 11卷, 2期, 頁367~394。
- [9]李祺菁, 2006, "我國PCB關鍵材料發展現況與供需分析", IEK。
- [10]周克祥, 2005, 企業自行成功建置ERP系統的導入程序以R公司為例, 世新大學, 碩士論文。
- [11]周斯畏, 洪憶華, 張又介, 2009, "ERP吸收的研究 - 吸收能力與環境不確定性的影響", 電子商務學報, 11卷, 2期, 頁287~310
- 。
- [12]孟憲敏, 1999, "自動化工程系統-ERP專題研究", 工研院機械所出版品。
- [13]林明杰, 陳悅琴, 2005, "企業知識能力與顧問涉入程度對ERP導入影響之研究 - 以代理理論探討", 電子商務學報, 7卷, 2期, 頁139~155。
- [14]林政坤, 劉宜菁, 2009, "從企業主管的角度探討擁有ERP證照的員工工作表現之研究", 電子商務學報, 11卷, 2期, 頁395~420
- 。
- [15]林鳳武, 2004, 影響資訊系統成功實現的整合理論模式與實證研究—管理模式、使用者認知偏差、與工作相依性, 國立高雄第一科技大學, 碩士論文。

- [16]洪廣朋，張榕容，2007，“從交易成本與社會交換觀點探討供應商採用電子化採購之影響因素”，電子商務學報，9卷，1期，頁71~96。
- [17]涂邦珪，2006，知識移轉對ERP系統導入成功之影響，國立中山大學，碩士論文。
- [18]張秀華，2008，ERP導入後學習對ERP使用及個人績效的影響 - 從社會認知理論及社會資本理論來探討，國立中央大學，碩士論文。
- [19]張素碧，2000，ERP系統在電子業導入成功關鍵因素之研究，元智大學，碩士論文。
- [20]張愛華，曾忠蕙，2008，“電子商務業者的顧客資本、市場導向與經營績效關係之研究”，電子商務學報，10卷，3期，頁727~756。
- [21]許文科，1999，企業導入ERP的成功關鍵因素探討，國立台灣科技大學，碩士論文。
- [22]陳如澤，2005，企業資源規劃系統導入對兩岸三地作業流程之影響，世新大學，碩士論文。
- [23]陳國維，2008，師徒效應對於ERP系統滿意度與持續使用意願影響之研究，國立中央大學，碩士論文。
- [24]陳瑞順，蔡永順，2005，資訊管理，企業資訊系統管理與個案分析，初版，智勝文化事業發行。
- [25]陳銀貴，2003，台灣PCB產業分析，拓璞產業研究所。
- [26]曾建瀛，2002，企業資源規劃於產業運用與成效探討--以AC公司為例，大葉大學，碩士論文。
- [27]曾淑峰，季延平，黃瓊玉，2008，“以架構為中心推展企業資源規劃（ERP）之研究”，電子商務學報，6卷，2期，頁251~263。
- [28]趙翠珍，2001，企業導入ERP系統之成功關鍵因素分析-以P公司導入SAP為例，大同大學，碩士論文。
- [29]歐陽崇榮，2000，圖書館自動化系統評估模式之建立與應用，國立中央大學，博士論文。
- [30]蔡鈴燕，2007，製造業導入資訊化之績效評估，國立高雄應用科技大學，碩士論文。
- [31]蕭國露，2002，探討降低員工抗拒變革管理因素之研究---以企業導入ERP為例，大葉大學，碩士論文。
- [32]蘇聖義，2006，全球運籌策略下之資訊建置模式研究以台灣印刷電路板產業為例，國立中山大學，碩士論文。
- [33]蘇豐裕，2008，ERP系統使用滿意度之研究-以F公司為例，國立高雄應用科技大學，碩士論文。