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Managing for IS Success: A Resource-Based Theory Perspective on IS Management

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Abstract

As information systems (IS) become inextricably linked with an organization's strategy and operations, the requirement for an IS capability becomes paramount. This capability represents the organization's ability to continuously deliver value from IS investments and is portrayed as the capacity to fuse IT knowledge and business knowledge, to construct a flexible IT infrastructure, and to exploit in full IS investments. Drawing on resource based theory, this paper extends the discourse in the literature, which is usually conducted at the organizational level, to an explicit incorporation of component resources. A model is developed linking IS capability with competencies, roles, knowledge, skills and personal attributes.

Introduction

Today, most organizations are totally dependent on their information systems and would quickly cease to function should the technology that underpins their business activities ever grind to a halt. In the words of Rockart (1988) '[i]nformation technology has become inextricably intertwined with business'. Indeed, in industries such as telecommunications, media and financial services, where the product is already or is being increasingly digitized, the mere existence of an organization crucially depends on the effective application of technology. With the growth in eBusiness, the use of technology is becoming just an accepted, indeed expected, way of doing business.¹ The consequence for competitive strategy is that in today's environment, "IT is the business strategy" (Earl and Feeny, 2000).

The formative writings on IT and competitive advantage tended to present descriptive accounts of organizations that had achieved competitive advantage through the application of technology (c.f. Cash and Konsynski, 1985; Ives and Learmount, 1984; McFarlan, 1984; Porter and Miller, 1985). A central prescription drawn from these early studies was that investments in IT should be planned and aligned to the corporate strategy. Yet, despite this call for formal strategic planning of IS investments, Ciborra (1994) asserts that successful applications of IT are often due more to serendipity rather than any formal planning. Indeed, a study by Kettinger *et al.* (1994) evaluating longitudinal changes in performance measures of 30 firms that had been cited as "classic"

cases of strategic use of IS indicated that a healthy skepticism concerning the competitive advantage payoffs of IT is in order. They asserted that management must more than simply assess the uniqueness or availability of emerging technological innovations in developing strategic IS plans.

Organizations may gain some 'first mover advantage' with an application but it can be quickly copied and is therefore not an advantage which is sustainable (Clemons and Row, 1991; Mata *et al.*, 1995), particularly when patent protection for IS applications is almost non-existent and where keeping an IS innovation secret is difficult, especially for systems used by customers or suppliers. Indeed, there is a strong argument that the use of standard applications packages, a common strategy today, can limit an organization's ability to innovate (Davenport, 1998; Prahalad and Krishnan, 1999).

The simple message is that IT itself has no inherent value; and the search for sustainability is therefore unlikely to have a technological foundation but be based within the very fabric of the organization. Accordingly, a key question is *how can an organization develop a capability to continuously deliver value from IS investments, thereby reducing risk and the dependence on luck and serendipity?*

In the paper we argue that resource-based theory, which is current in the strategic management literature (Barney, 1991; Wernerfelt, 1984), provides a theoretical and empirical basis to explore the exposition and manifestation of this IS capability. By focusing the discussion at a resource level, increased clarity is given to the process through which an organization's resources contribute to the development of this capability. This perspective on resource-based theory is an emerging one as even in the strategic management literature it recognizes that there is a need for a more developed understanding of the nature of resources in action (Black and Boal, 1994; Majumdar, 1998; Haanes and Fjeldstad, 2000).

This paper first examines the IS function and its role in value delivery. The search for the sustainability of IS competitive advantage is then explored and some conclusions are drawn. Resource-based theory is introduced and its contribution towards the articulation of an IS capability is described. Finally, a framework linking the IS capability with resources is developed and described.

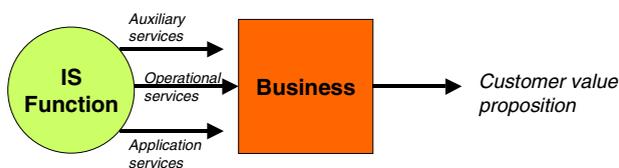
¹ This has been referred to as the "strategic necessity hypothesis" (Clemons and Row, 1991; Floyd and Wooldridge, 1990; Powell and Dent-Miscallef, 1997).

The IS function and value delivery

In order to surface the issues to be considered in this paper, figure 1 illustrates schematically the position of the IS function in relation to the rest of the organization and the delivery of the customer value proposition. The IS function delivers, either directly or indirectly through third parties, a variety of services to the internal business community. These services can be classified as operational services, application services, and auxiliary services.

As guardians of the technical platform, *operational services* relate to the operation and maintenance of this infrastructure. This platform includes PCs, printers, cabling, modems, and servers as well as the operating system that enables these components to function. The IS function, via applications, provides an assortment of *application services* to users. These services, derived directly from the application of technology, are essentially concerned with the information handling ability of IT and range from e-mail to sophisticated order management facilities to supply chain applications to financial management applications. The IS function also provides a wide range of *auxiliary services* such as help desk, contingency planning, security and back-up, training, consultancy, systems analysis and systems design.

Figure 1 The IS function and the customer value proposition.



In general, the IS function has had a poor record of delivering business value from these services and in many organizations the senior management team continue to be dissatisfied with the value which they perceive their organizations are deriving from investments made in information systems. Whether a contributor or consequence, there is often an adversarial relationship between the IS function and the rest of the business (Grindley, 1993; Schein, 1992).

It is against this background that many organizations have sought to improve the performance of the IS function. Unfortunately, most initiatives address the symptoms rather than the causes and have had little impact (Peppard and Ward, 1999). Most focus on creating the “value-added IS function” rather than on creating “value added from IS”, a subtle but important observation. Further, the nature of information is such that it is pervasive and permeates the whole organization and is used by all organizational members from senior management to front line staff to back room operatives in the performance of their job. While responsibility for marketing, accounting, production or other organizational

activities can be assigned to specific individuals and functions, the management of information is unique. Information management is a key element of the role that all employees play in an organization. For example, although marketing and production are business functions they both demand the processing of information from customers, suppliers, regulatory authorities, financial institutions, etc. Although IT provides a powerful vehicle for processing information this has merely moved the focus away from the real issue of managing information to the delivery of technology.

It is indeed unfortunate that organizations have a separate IS function; a legacy that is a key source of the problem with value delivery. A direct consequence is that responsibility for IS is seen as the obligation of the IS function. Research has shown that delivering value from IS is an organization wide issue and not a responsibility that can be addressed solely by the IS function (Peppard *et al.*, 2000).

IT and competitive advantage: in search of sustainability

Sustainability can be defined as an organization’s ability to continually deliver value from IS. Kettinger *et al.* (1994) concluded that the attainment of sustained IS based competitive advantage may be more a process of building organizational infrastructure in order to enable innovative action strategies. In a conceptual analysis, Mata *et al.* (1995) suggest that in the search for IT-based sources of sustainable competitive advantage, organizations must focus less on IT, *per se*, and more on the process of organizing and managing IT within a firm. Further support for this position is provided by Dvorak *et al.* (1997) who note that what distinguishes organizations with high performance IT is not technical wizardry but the way they manage their IT activities. Ross *et al.* (1996) contend that for an organization to apply IT to enhance competitiveness lies in the development of an effective IS capability. *So what is this capability?*

In short, this capability represents the organizations ability to continuously deliver value through IS investments. This suggests that the correct investments have to be made. There is also an implicit assumption that technology is actually used, that the value is captured² by the organization, and that it does not become a source of competitive disadvantage. Analysis of prior research indicates that this capability comprises three core elements: the capacity to fuse business knowledge and IT knowledge (Peppard and Ward, 1999); a flexible and reusable IT infrastructure (Broadbent and Weill, 1997; Keen, 1993; Ross *et al.*, 1996; Weill and Broadbent, 1998); and the ability to exploit IS investments (Peppard

² Bowman and Ambrosini (2000) argue that resource based theory gives an inadequate treatment to value capture.

et al., 2000) through an effective IS “use process” (Soh and Markus, 1995).

With the increasing dependence of organizations on their information systems, significant research effort has been focused on the management of IS and this research provides a glimpse of what contributes towards the development of this capability. Prescriptions have included treating IS as a strategic resource (Earl, 1989, 1993; Ward and Griffiths, 1995; Wiseman, 1985); formal planning of IS investments (Bakos and Treacy, 1986; Earl, 1989; Ward and Griffiths, 1995); aligning IT, business strategy and organization (Henderson and Venkatraman, 1993); the rapid deployment of technology (Rockart and Hofman, 1992); re-engineering of work processes to take advantage of technological opportunities (Davenport, 1993; Hammer, 1991) and the management of the change brought about by the reengineering of these business processes (Hall *et al.*, 1993; Jarvenpaa and Stoddard, 1993; Willcocks and Smith, 1995); the management of change as a result of implementing new technology (Benjamin and Levinson, 1993; Benjamin and Markus, 1997; Markus and Benjamin, 1996); and developing appropriate sourcing strategies (Cross, 1995; Earl, 1996; Lacity and Hirschheim, 1995; Lacity *et al.*, 1995, 1996).

There has also been an increasing body of work exploring the IS function, including its configuring (Von Simson, 1990); alignment with the enterprise (Brown and Magill, 1994); and role (Hodgkinson, 1996; Venkatraman, 1997). With an ever growing percentage of IS budgets accounting for IS services, the service dimension of IS is increasingly being studied (Ketinger and Lee, 1997; Pitt *et al.*, 1995; Whyte *et al.*, 1997).

The gap between the IS function and the rest of the organization has been increasingly recognized and there have been studies exploring how it can impact the organization’s ability to leverage value from IS (Grindley, 1991; Schein, 1992; Peppard and Ward, 1999; Ward and Peppard, 1996). There has been a body of work which has addressed the skills required of IS professionals (Clark *et al.*, 1997; Cross *et al.*, 1997; Lee *et al.*, 1995; Markus and Benjamin, 1996; Palmer and Ottley, 1990; Skyrme, 1992; Todd *et al.*, 1995) and IS functional competencies (Feeny and Willcocks, 1998). The importance of establishing an internal “information economy” (Zmud *et al.*, 1986) and an “information culture” (Davenport and Prusak, 1997) in leveraging value has also been identified.

Research has also explored the role of the CIO in adding value (Earl and Feeny, 1994; Enns and Huff, 1997; Stephens *et al.*, 1994), CEO attributes and firm IT performance (Ginsberg and Venkatraman, 1992; Henderson and Venkatraman, 1993), the role of the CEO in the information age (Earl and Feeny, 2000) and the relationship between the CIO and CEO (Feeny *et al.*, 1992). Indeed, studies have espoused the “management difference” as an important contributor to IS success (Keen, 1993; Mata *et al.*, 1995; Neo, 1988). Assigning

responsibility for IS has also received attention and while a “grey area of management” (Griffiths, 1994) prescriptions have appeared calling for the “end of delegation” of IS decisions to IS professionals (Anonymous, 1995; Dutta, 1996), strong recommendations that the “line takes leadership” (Rockart, 1988), an examination of the new IS leaders (Applegate and Elam, 1992) and a conceptual framework to help organizations devise and implement an effective “IT management architecture” (Boynton *et al.*, 1992). Orlikowski and Gash (1994) suggest that success requires adaptations in the frames and behavioral repertoires of managers, technologists and IT users.

Much of this research output is non-contentious even if it often inaccessible to a practitioner audience (Benbasat and Zmud, 1999; Senn, 1998). This presents a dilemma for practitioners. *How can an organization develop this “organizational infrastructure” so that it can continue to achieve sustained advantage from IS? How does an organization create this IS capability?* The preceding paragraphs give a glimpse of the range of potential areas that must be addressed to ensure success with IS. Yet to date, the IS discipline lacks an integrative theory which brings together this research and consequently a coherent theory that provides a prescriptive framework guiding action.

The nature of research in IS has tended to focus on discrete areas within the discipline, reflecting the practice in most management disciplines where research delves deeper and deeper into a topic, improving our knowledge of the particular area without necessarily providing a holistic perspective. For example, which acknowledging the importance of the CEO in IT related matters, focusing research solely on the CEO is likely to increase our knowledge of the role of the CEO in relation to IS management, but does not necessarily ensure success. An “IT-oriented” or “IT-savvy” CEO (using the terminology of Earl and Feeny (2000)) is a necessary condition, probably even mandatory, but definitely not a sufficient condition for creating this IS capability. Other factors and conditions are required. Similarly, it is fruitless an organization developing an e-commerce strategy if it cannot (i.e., does not have the capability to) implement it.

The resource-based theory of the firm

Resource-based theory (RBT) has been developed in the strategic management literature to provide an alternative perspective on the source of competitive advantage. Its basic premise is that what explains success is not the industry within which a firm competes (Rumelt, 1991) but through processes of resource accumulation and deployment, leading to idiosyncratic endowments of proprietary assets (Collis and Montgomery, 1995; Dierickx and Cool, 1989; Peteraf, 1993; Prahalad and Hemel, 1990; Wernerfelt, 1984). Resources include

structure, processes, people, culture, knowledge, relationships, etc.

Competencies represent an organization’s capacity to deploy and integrate resources, usually in combination, using organizational processes, to effect a desired result (Amit and Schoemaker, 1993). They are the “skills or knowledge sets” embedded in the organization’s systems (Quinn and Hilmer, 1994). Back in 1991 Clemens and Row suggested that RBT offered great potential to IS yet few IS researchers have drawn on it for guidance. Indeed, in his study of strategic information systems planning, Earl (1993) eluded to the notion of competence with his “organizational approach”; Ciborra’s (1994) notion of “serendipity” could be due to a well developed capability that was intangible and invisible.

Towards development of the IS capability

Earlier in the paper the concept of an IS capability was explored and its three core elements defined. In order to sustain advantage from IS, the challenge for an organization is to develop this capability. Resource based theory provides strong support for the argument that certain competencies within the organization are required to deliver this capability. In a previous paper (Peppard *et al.*, 2000) the notion of *IS competence* was developed and portrayed as capturing all aspects of the management of information in an organization, including assessing the role of information in an industry, the exploration of the potential impact of technology, the identification of competitive opportunities through to the design of systems, the deployment of information technologies and the realization of business benefits from these systems. Based on an empirical study, this research distinguished between *macro* IS competencies and *micro* IS competencies, defining 6 macro IS competencies and 25 micro IS competencies. Micro IS competencies represent a more detailed exposition of macro competencies. For the purpose of this paper, the discussion will be held at the level of macro competencies, and these are defined in table 1.

One of the key findings of this research, which is of central relevance to this paper, is that all the “elements” which comprise each competence may not reside in a particular business function and indeed they are more likely to be dispersed across the organization. This observation provides a basis for understanding why value may not be derived from IS investments as particular competencies may not manifest themselves as some component elements will be located in the business area while other elements will be primarily located in the IS function with little or no coordination across functions to ensure that these IS competencies exist.

The implication of this situation is that if the constituent elements of each competence can be first identified it may be possible to guide its development. In

the language of resource-based theory, these elements are known as *resources* or *factors*.

Table 1. Macro IS competence definitions (source: Peppard *et al.*, 2000).

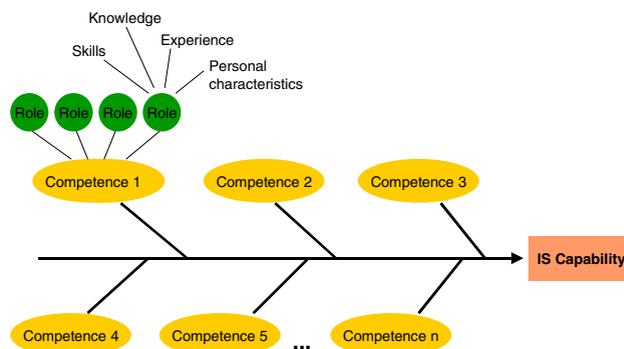
Macro IS competence	The ability to...
Formulate strategy	...evaluate strategic information and technology based opportunities as part of the business strategy formulation process and define the decision-making environment
Design processes and information	...translate the business strategy into business processes and information based needs
Define supply resources	...translate the business strategic vision into long-term information supply resource requirements
Develop supply resources	...create and maintain the information supply resources
Exploit and monitor	...develop and apply exploitation plan and monitor value creation
Develop, implement and operate solutions	...deploy resources to develop, implement and operate solutions

In an IS context, these resources are primarily knowledge-based and incorporates knowledge from both technical and business sources. This knowledge must also be blended with the skills, experiences and personal characteristics of individual job incumbents.

In an organizational environment, competencies are enacted by organizational members performing particular roles. Prescriptively, roles encompass the expected behaviors attached to a position or job. The performance of a particular role requires not only knowledge but also skills, experience and certain personal characteristics. These roles are performed by individuals within organizational processes. Individuals may have many roles, operate within a number of processes and contribute to different competencies.

Figure 2 illustrates the relationship between the IS capability and IS competencies. It also highlights that each of the competencies is enacted through roles; while roles may be defined, their enactment is framed by the knowledge, skills, experiences and personal characteristics of incumbents in job positions.

Figure 2 Developing the IS capability.



Conclusion

In this paper we have argued that today organizations require an IS capability if they are to derive value from their investments in IS. This capability is unlikely to give direct advantage, but provides a platform for creating an enduring ability to deliver value. It was further argued that while IS research provides glimpses of what contributes to the development of this capability there is a lack of an integrative framework to bring this body of research together. Resources based theory is proposed as providing both the theoretical and empirical basis to explore this IS capability as well as proving the mechanism to integrate this diverse research base. A framework was developed which illustrates the linkage this IS capability and competencies, processes, roles, knowledge, skills, experience, and personal attributes.

References

- Amit, R. and Schoemaker, P.J.H., (1993) 'Strategic assets and organizational rent', *Strategic Management Journal*, **14**, 1, pp. 33-46.
- Anonymous, (1995) 'The end of delegation? Information technology and the CEO', *Harvard Business Review*, September-October, pp. 161-172.
- Applegate, L.M. and Elam, J.J., (1992) 'New information systems leaders: a changing role in a changing world', *MIS Quarterly*, **16**, pp. 469-490.
- Bakos, J. and Treacy, M., (1986) 'Information technology and corporate strategy: a research perspective', *MIS Quarterly*, **10**, 2, pp. 107-119.
- Barney, J.B., (1991) 'Firm resources and sustained competitive advantage', *Journal of Management*, **17**, pp. 99-120.
- Benbasat I., and Zmud, R.W. (1999) 'Empirical research in information systems: the practice of relevance,' *MIS Quarterly*, **23**, 1, pp. 3-16.
- Benjamin, R.I. and Levinson, E., (1993) 'A framework for managing IT-enabled change', *Sloan Management Review*, Summer, pp. 23-33.
- Benjamin, R.I. and Markus, M.L., (1997) 'IT enabled organizational change: new developments for IT specialists', in C. Sauer and P.W. Yetton and associates, *Steps to the Future: Fresh Thinking on the Management of IT-Based Organizational Transformation*, Jossey Bass Publishers, San Francisco, pp. 115-142.
- Black, J.A. and Boal, K.B., (1994) 'Strategic resources: traits, configurations, and paths to sustainable competitive advantage', *Strategic Management Journal*, **15**, pp. 131-148.
- Bowman, C. and Ambrosini, V., (2000) 'Value creation versus value capture: towards a coherent definition of value in strategy', *British Journal of Management*, **11**, 1-15.
- Boynton, A.C., Jacobs, G.C. and Zmud, R.W., (1992) 'Whose responsibility is IT management', *Sloan Management Review*, Summer, pp. 32-38.
- Broadbent, M. and Weill, P., (1997) 'Management by maxim: how business and IT managers can create IT infrastructures', *Sloan Management Review*, Spring, pp. 77-92.
- Brown, C.V. and Magill, S.L., (1994) 'Alignment of the IS function with the enterprise: towards a model of antecedents', *MIS Quarterly*, **18**, pp. 371-403.
- Cash, J.I. and Konsynski, B.R., (1985) 'IS redraws competitive boundaries', *Harvard Business Review*, March-April.
- Ciborra, C., (1994) 'The grassroots of IT and strategy', in C. Ciborra and T. Jelessi, eds., *Strategic Information Systems: A European Perspective*, Wiley, Chichester, pp. 3-24.
- Clark, C.E., Cavanaugh, N.C., Brown, C.V. and Sambamurthy, V., (1997) 'Building change-readiness capabilities in the IS organization: insights from Bell Atlantic experience', *MIS Quarterly*, **21**, 4, pp. 425-455.
- Clemons, E.K. and Row, M.C., (1991) 'Sustaining IT advantage: the role of structural difference', *MIS Quarterly*, **15**, 3, pp. 275-292.
- Collis, D.J. and Montgomery, C.A., (1995) 'Competing on resources: strategy in the 1990s', *Harvard Business Review*, July-August, pp. 118-128.
- Cross, J., (1995) 'IT outsourcing: British Petroleum's Competitive Approach', *Harvard Business Review*, May-June, pp. 94-102.
- Cross, J., Earl, M.J. and Sampler, J.L., (1997) 'Transforming the IT function and British Petroleum', *MIS Quarterly*, **21**, 4, pp. 401-423.
- Davenport, T.H., (1998) 'Putting the enterprise back into enterprise systems', *Harvard Business Review*, July-August, pp. 121-131.
- Davenport, T.H., (1993) *Process Innovation*, Harvard Business School Press, Boston.
- Davenport, T.H. and Markus, M.L., (1999) 'Rigor Vs relevance revisited: response to Benbasat and Zmud', *MIS Quarterly*, **23**, 1, pp. 19-23.
- Davenport, T.H. with Prusak, L., (1997) *Information Ecology: Mastering the Information and Knowledge Environment*, Oxford University Press, New York.
- Dierickx, I. and Cool, K., (1989) 'Asset stock accumulation and sustainability of competitive advantage', *Management Science*, **35**, 12, pp. 1504-1514.
- Dutta, S., (1996) 'Linking IT and business strategy: the role and responsibility of senior management', *European Management Journal*, **14**, 3, pp. 255-268.
- Dvorak, R.E., Holen, E., Mark, D., Meehan, W.F., (1997) 'Six principles of high-performance IT', *The McKinsey Quarterly*, 3, 164-177.

- Earl, M.J., (1996) 'The risks of outsourcing IT', *Sloan Management Review*, Spring, pp. 26-32.
- Earl, M.J., (1993) 'Experiences in strategic information systems planning', *MIS Quarterly*, **17**, 1, pp. 1-24.
- Earl, M.J., (1989) *Management Strategies for Information Technology*, Prentice Hall International, Hemel Hempstead.
- Earl, M.J. and Feeny, D., (2000) 'How to be a CEO for the information age', *Sloan Management Review*, Winter, pp. 11-23.
- Earl, M.J. and Feeny, D., (1994) 'Is your CIO adding value', *Sloan Management Review*, Spring, pp. 11-20.
- Enns, H.G. and Huff, S.L., (1997) 'CIOs' influence on business strategy formulation and realization', paper presented at the 2nd AIS conference, Indianapolis, Indiana, August 15-17, 1997.
- Feeny, D.F. and Willcocks, L.P., (1998) 'Redesigning the IS function around core capabilities', *Long Range Planning*, **31**, 3, pp. 354-367.
- Feeny, D.F., Edwards, B. and Simpson, K., (1992) 'Understanding the CEO/CIO relationship', *MIS Quarterly*, **16**, 4, pp. 435-448.
- Floyd, S.W. and Wooldridge, B., (1990) 'Path analysis of the relationship between competitive strategy, information technology and financial performance', *Journal of Management Information Systems*, **7**, 1, pp. 47-64.
- Ginsberg, A. and Venkatraman, N., (1992) 'Investing in new information technology: the role of competitive posture and issue diagnosis', *Strategic Management Journal*, Summer Special Issue, **13**, pp. 37-53.
- Griffiths, C., (1994) 'Responsibility for IT: a gray area of management', in L. Willcocks, ed., *Information Management: The Evaluation of Information Systems Investments*, Chapman & Hall, London.
- Grindley, K., (1993) *IT in the Board Room*, Pitman Publishing, London.
- Haanes, K. and Fjeldstad, O., (2000) 'Linking intangible resources and competition', *European Management Journal*, **18**, 1, pp. 52-62.
- Hall, G., Rosenthal, J. and Wade, J., (1993) 'How to make re-engineering really work', *Harvard Business Review*, November-December, pp. 119-131.
- Hammer, M., (1990) 'Reengineering work: don't automate - obliterate', *Harvard Business Review*, July-August, pp. 104-112.
- Henderson, J.C. and Venkatraman, N., (1993) 'Strategic alignment: leveraging information technology for transforming organizations', *IBM Systems Journal*, **32**, pp. 4-16.
- Hodgkinson, S.L., (1996) 'The role of the corporate IT function in the federal IT organization', in M.J. Earl, ed., *Information Management: The Organizational Dimensional*, Oxford University Press, New York, pp. 247-269.
- Ives, B. and Learmonth, G.P., (1984) 'The information system as a competitive weapon', *Communications of the ACM*, **27**, 12, pp. 1193-1201.
- Jarvenpaa, S. and Stoddard, D.B., (1993) *Business Process Reengineering: Tactics for Managing Radical Change*, Working Paper, Harvard Business School, Boston, MA.
- Keen, P.G.W., (1993) 'Information technology and the management difference: a fusion map', *IBM Systems Journal*, **32**, 1, pp. 17-39.
- Kettinger, W.J. and Lee, C.C., (1997) 'Pragmatic perspectives on the measurement of information systems service quality', *MIS Quarterly*, **21**, pp. 223-240.
- Kettinger, W., Grover, V., Guha, S. and Segars, A.H., (1994) 'Strategic information systems revisited: a study in sustainability and performance', *MIS Quarterly*, **18**, pp. 31-55.
- Lacity, M.C. and Hirschheim, R., (1995) *Beyond the Information Systems Outsourcing Bandwagon: The Insourcing Response*, Wiley, Chichester.
- Lacity, M.C., Willcocks, L.P. and Feeny, D.F., (1996) 'The value of selective IT sourcing', *Sloan Management Review*, Spring, pp. 13-25.
- Lacity, M.C., Willcocks, L.P. and D.F. Feeny, (1995) 'IT outsourcing: maximizing flexibility and control', *Harvard Business Review*, May-June, pp. 84-93.
- Lee, D.M.S., Trauth, E.M. and Farwell, D., (1995) 'Critical skills and knowledge requirements of IS professionals: a joint academic/industry investigation', *MIS Quarterly*, **19**, 3, pp. 313-340.
- Markus, M.L. and Benjamin, R.I., (1996) 'Change Agency - the next IS frontier', *MIS Quarterly*, **20**, pp. 385-407.
- Majumdar, S.K., (1998) 'On the utilisation of resources: perspectives from the US telecommunications industry', *Strategic Management Journal*, **19**, 9, pp. 809-831.
- Mata, F.J., Fuerst, W.L. and Barney, J., (1995) 'Information technology and sustained competitive advantage: a resource-based analysis', *MIS Quarterly*, **19**, pp. 487-505.
- McFarlan, F.W., (1984) 'Information technology changes the way you compete', *Harvard Business Review*, May-June.
- Neo, B.S., (1988) 'Factors facilitating the use of information technology for competitive advantage: an exploratory study', *Information and Management*, **15**, pp. 191-201.
- Orlikowski, W. and Gash, D., (1994) 'Technological frames: making sense of information technology in organizations', *ACM Transactions on Information Systems*, **12**, 2, pp. 174-207.

- Palmer, C. and Ottley, S., (1990) *From Potential to Reality: Hybrids - A Critical Force in the Application of Information Technology in the 1990s*, British Computer Society, London.
- Pitt, L.F., Watson, R.T. and Kavan, C.B., (1995) 'Service quality: a measure of information systems effectiveness', *MIS Quarterly*, 19, pp. 173-185.
- Peppard, J.W., Lambert, R., and Edwards, C.E., (2000) 'Whose Job is it anyway?: organizational information competencies for value creation', *Information Systems Journal*, forthcoming.
- Peppard, J.W. and Ward, J.M., (1999) 'Mind the gap': diagnosing the relationship between the IT organization and the rest of the business', *The Journal of Strategic Information Systems*, 8, pp. 29-60.
- Peteraf, M.A., (1993) 'The cornerstones of competitive advantage', *Strategic Management Journal*, 14, 3, pp. 179-191.
- Porter, M.E. and Miller, V., (1985) 'How information gives you a competitive advantage', *Harvard Business Review*, July-August, pp. 149-160.
- Powell, T.C. and Dent-Micallef, A., (1997) 'Information technology as competitive advantage: the role of human, business and technology resources', *Strategic Management Journal*, 18, 5, pp. 375-405.
- Prahalad, C.K. and Krishnan, M.S. (1999) 'The new meaning of quality in the information age', *Harvard Business Review*, September-October, pp. 109-118.
- Prahalad, C.K. and Hamel, G., (1990) 'The core competence of the corporation', *Harvard Business Review*, May-June, pp. 79-91.
- Quinn, J.B. and Hilmer, F.G., (1994) 'Strategic outsourcing', *Sloan Management Review*, Summer, pp. 43-55.
- Rockart, J., (1988) 'The line takes leadership – IS management in a wired society', *Sloan Management Review*, Summer, pp. 57-64.
- Rockart, J. and Hofman, J.D., (1992) 'Systems delivery: evolving new strategies', *Sloan Management Review*, Summer, pp. 21-31.
- Rockart, J., Earl, M.J. and Ross, J.W., (1996) 'Eight imperatives for the new IT organization', *Sloan Management Review*, Fall, pp. 43-55.
- Ross, J.W., Mathis Beath, C. And Goodhue, D., (1996) 'Develop long-term competitiveness through IT assets', *Sloan Management Review*, Fall, pp. 31-42.
- Rumelt, R.P., (1991) 'How much does industry matter?', *Strategic Management Journal*, 12, 3, pp. 167-185.
- Schein, E.H., (1992) *Organizational Culture and Leadership*, Jossey-Bass, San Francisco (chapter 12 'Management and information technology: two subcultures in collision?' pp. 276-294).
- Senn, J. (1998) 'The challenge of relating IS research to practice,' *Information Resources Management Journal*, 11, 1, pp. 23-28.
- Skyrme, D., (1992) 'From Hybrids to bridge building', *Research and Discussion Papers, RDP92/1*, Oxford Institute of Information Management, Templeton College, Oxford.
- Soh, C. and Markus, M.L., (1995) 'How IT creates business value: a process theory synthesis', in *Proceedings of the 16th Annual International Conference on Information Systems*, Amsterdam, The Netherlands, December, pp. 29-41.
- Stephens, C.S., Ledbetter, W.N., Mitra, A., and Ford, F.N., (1994) 'Executive of functional manager? The nature of the CIOs job', *MIS Quarterly*, 18, pp. 449-467.
- Todd, P.A., McKeen, J.D. and Gallupe, R.B., (1995) 'The evolution of IS job skills: a content analysis of IS job advertisements from 1970-1990', *MIS Quarterly*, 19, pp. 1-27.
- Vankatraman, N., (1997) 'Beyond outsourcing: managing IT resources as a value centre', *Sloan Management Review*, Spring, pp. 51-64.
- Von Simson, E.M., (1990) 'The centrally decentralized IS organization', *Harvard Business Review*, July-August, pp. 158-162.
- Ward, J. and Griffiths, P., (1996) *Strategic Planning for Information Systems*, Wiley, Hemel Hempstead.
- Ward, J. and Peppard, J., (1996) 'Reconciling the IT/business relationship: a troubled marriage in need of guidance', *Journal of Strategic Information Systems*, Vol. 5, No. 1, pp. 37-65.
- Weill, P. and Broadbent, M., (1998) *Leveraging the New Infrastructure: How Market Leaders Capitalize on Information Technology*, Harvard Business School Press, Boston, Massachusetts.
- Wernerfelt, B., (1984) 'A resource-based view of the firm', *Strategic Management Journal*, 5, pp. 171-180.
- Whyte, G., Bytheway, A. and Edwards, C., (1997) 'Understanding user perceptions of information systems success', *Journal of Strategic Information Systems*, 6, pp. 35-68.
- Willcocks, L. and Smith, G., (1995) 'IT-enabled business process reengineering: human and organizational dimensions', *Journal of Strategic Information Systems*, 4, 3.
- Wiseman, C., (1985) *Strategy and Computers*, Free Press, New York.
- Zmud, R.W., Boynton, A.C. and Jacobs, G.C., (1986) 'The information economy: a new perspective for effective information systems management', *Data Base*, 18, 1, pp. 17-23.