Strategic Cost-Cutting in Information Technology: toward a Framework for Enhancing the Business Value of IT

Seyed Mohammaddagher Jafari[*]

Assistant Professor Faculty of Management and Accounting, Farabi Campus University of Tehran

Abstract

The increasing dependency of many businesses with information technology (IT) and the high percentage of the IT investment in all invested capital in business environment ask for more attention to this important driver of business. The limitation of capital budget forces the managers to look for more wise investment in IT. There are many cost-cutting techniques in the literature and each of them has a different impact on the organization. This study is one of the first steps in providing more insight on this issue via proposing a conceptual framework for strategic cost-cutting in IT. The literature review revealed that the strategic role of IT in organizations, IT costs structure, firm's IT structure, senior management support and organizational learning are the important factors that affect the cost-cutting technique selection in IT. The proposed framework focuses on the strategic role of IT in business to suggest which cost-cutting techniques are the best to be applied in an organization in order to save costs while ensuring high-quality service and support for business growth and maximizing business value from IT spending.

Keywords:

[*] Corresponding Author, Tel: +982536166417   Email: sm.jafari@ut.ac.ir

Introduction

Today, the business environment is rapidly changing. Companies face the challenge of increasing competition, expanding markets, and rising customer expectations. This increases the pressure on companies to lower total costs (Umble *et al*., 2003). Organizations increasingly rely on Information Systems (IS) to acquire a competitive edge, with this often translating to an increased budget allocation to support their investments in an IS infrastructure (Irani *et al*., 2006). The purchase of Information Technology (IT) and development of an IS are seen as a source of increasing cost and concern of management (Heo & Han, 2003; Legris *et al*., 2003; Joshi & Pant, 2008).

According to Laudon and Laudon (2012), private business investment in IT grew from 32 percent to 52 percent of all invested capital. Moreover, in 2010, American businesses will spend over $562 billion on information systems hardware, software, and telecommunications equipment. In addition, they will spend another $800 billion on business and management consulting and services, much of which involves redesigning firms' business operations to take advantage of these new technologies such as IT. This huge amount of money asks managers for more attention on their IT spending activities and seeks for the wise investment choices.

Investment in IT should contribute to company value (McFarlan, 1984; Porter and Millar, 1985) and also to the ability of the firm to compete in the marketplace (Applegate *et al*., 2005). In fact, nowadays; IT has become a strategic and competitive tool for many organizations (Porter and Millar, 1985; Prem kumar & King, 1992). There is the widespread recognition of the need to consider the social and organizational implications associated with the adoption of IT/IS from a cost perspective, if management is to seek competitiveness through reducing their IS costs (Irani *et al*., 2006).

During the recession of the late 1980s and early 1990s many organizations were forced to reformulate their IT and IS budgets, which resulted in many companies significantly reducing their investments in new systems and technology (Irani *et al.*, 1997). With IT budgets flat or growing only at modest rates, Chief Information Officers (CIOs) are required to contain IT costs while still providing high-quality service and support for business growth. Maintaining the balance between cost containment and contributing to the business is a challenge all CIOs face (Gartner, 2006).

The global economic recession is driving businesses to cut costs in the face of shrinking revenues and is preoccupying the minds of many IT leaders. The biggest challenge CIOs face is how to deliver high IT performance in the midst of diminishing budgets and cost-conscious CEOs (Accenture, 2008).

Moreover, Nolan and McFarlan (2005) argued, unfortunately, most boards of directors remain largely in the dark when it comes to IT spending and strategy. Few understand the full degree of their operational dependence on computer systems or the extent to which IT plays a role in shaping their firms' strategies.

On the other hand, the global economic crisis has reinforced the need for cost-cutting activities within organizations. According to McGee (2008), there certainly are many examples where IT cost-cutting efforts have to be undertaken during challenging times - economic recession- for specific industries and companies. Moreover, cost-cutting can assist firms to maximize their business value from IT spending.

There is a widespread recognition in the literature on the role of IT as a means for cost-cutting in business (Kauffman & Kriebel 1988; Mukhopadhyay *et al.*, 1995; Hitt & Brynjolfsson, 1996; Mahadevan, 2000; Belleflamme, 2001; Devaraj & Kohli 2003) however, very little literature available on cost-cutting in IT itself and most of them are

from IT outsourcing literature. Cost-cutting it, IT has been rarely on the focus of researchers and need more attention. The aim of this study is to fill the knowledge gap in cost-cutting in IT by strategic orientation with applying a contingency approach. Contingency theory suggests that various factors will influence an organization's approach to IT management (Cohen, 2003). Therefore, the purpose of this research is to provide a concrete framework to help senior managers/CIOs think about IT cost-cutting activities and focus on how to strategically manage these activities to ensure their success.
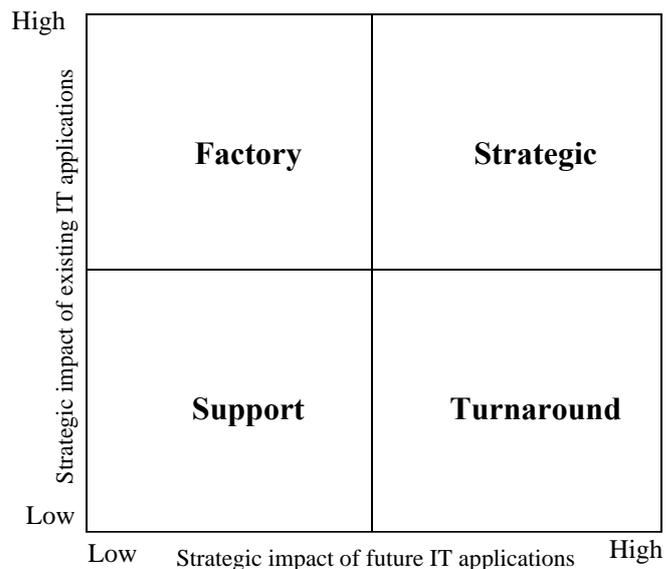
The Strategic Role of IT

The underlying need for IT differs across organizations and industries. Nolan and McFarlan (2005) argued that the IT strategy that works for a clothing retailer is not appropriate for a large airline; the strategy that works for eBay cannot work for a cement company. Porter and Millar (1985) indicated, managers should predict the likely impact of information technology on their industry's structure and competitive forces. Revenaugh (1994) mentioned that the importance of IT within a firm varies depending on how critical its IT/IS applications are in achieving its overall strategic goals.

One of the most useful IT architecture planning methodologies is the IT strategic grid (Figure 1). This grid that developed by McFarlan *et al*. (1983) and elaborated recently by Nolan and McFarlan (2005) is a well-accepted strategic planning tool for evaluating the importance of a particular organizational element in the strategic direction of the firm.

Strategic grid is a contingency approach that can be used to determine the strategic relevance of IT/IS to the organization (Jiang & Klein, 1999). This grid is based on the current and future impact of IT/IS. The axes of the IT strategic grid portray the current (shown as the Y-axis) and future (X-axis) strategic importance of information

systems activities to a firm. As shown in Figure 1, four quadrants are identified as "Strategic", "Turnaround", "Factory" and "Support" (McFarlan *et al*., 1983; Nolan & McFarlan, 2005).

Strategic organizations, where planned IT applications are critical for future success and IT activities are critical to existing operations. *Turnaround organizations*, which are not totally dependent on current IT to function but new IT methods, essential for reaching organizational objectives, have been developed. *Factory organizations*, which are dependent on IT for their day-to-day operations but will not gain significant advantage from further development. *Support organizations*, which are neither highly dependent on IT nor will be improved by them in the future.

Figure 1. The IT Strategic Grid (McFarlan et al., 1983; and Nolan and McFarlan, 2005)

Each of these four categories of IT impact represents very different organizational needs for information systems and technologies. For example, turnaround situations may require a small revolution, with stepped increases in funding, education, and management support and involvement. In support situations, IT budgets may be smaller, IT planning shorter term, IT management lower profile, and IT managers lower status than a strategic context. Factory contexts are more likely to require consistent and stable management attention, with careful budgeting, sound project and operations control, and emphasis on reliability and efficiency (Earl, 1989).

The four IT/IS environments defined by the IT strategic grid framework suggest that each environment does require a different IT/IS management approach. IT/IS is of great strategic importance in some organizations, while it has minimal importance in others. Therefore, it is inappropriate to expect both types of organizations to place the same amount of emphasis on IT cost-cutting activities.

IT Costs Structure

In a recessionary climate, a concern for cost justification, quick returns and indeed application of the IT/IS for cost reduction purposes would seem to be paramount and this could pressure proponents of IT/IS into understating costs (Irani *et al*., 1997). The need for a robust IT/IS cost identification and management has already been widely cited in the literature (Hochstrasser, 1990; Ezingeard *et al*., 1999; Irani *et al*., 2001; Irani & Love, 2001). However, Keen (1991) states that IT costs have historically been poorly managed. Moreover, Irani *et al*. (1997) cited empirical evidence from a past study which showed that many manufacturing companies fail to account for the full complement of IT-related costs.

Paula and Laurence (1997) argued that what makes the process of identification and allocation of IS costs more complicated is that

different kinds of costs occur within and outside the scope of the IS function. Irani *et al*. (2006) mentioned that it is the difficulty of identifying these often hidden costs together with not being able to adequately support their control and reduction that frustrates many project champions. The problem of IT/IS cost identification remains one rooted in the experiences and knowledge inherent in individuals or project teams. Moreover, Gartner (2006) claimed that CIOs who understand their IT cost structure and cost drivers have a solid base for developing plans that can deliver ongoing cost savings. Therefore, it can be concluded that awareness of an organization's IT costs structure has a direct impact on cost-cutting activities.

Firm's IT Structure

The organization's information-processing capacity is reflected in its IT structure. This concept has been conceptualized mostly along three dimensions (Bergeron *et al*., 2004). The first is the IT organizational architecture dimension, which comprises the degree of decentralization of the IT organizational structure and the locus of responsibility of the IT function (Brown & Magill, 1994; Brown & Magill, 1998). The second is the technological architecture dimension, encompassing standardization of the technology, the degree of application and data integration and the nature of hardware deployment (Ein-Dor & Segev, 1982; Leifer, 1988; Fiedler *et al*., 1996; Holsapple & Luo, 1996). The third is the process and skills dimension, which includes planning mechanisms and the standardization of application development and implementation approaches (Allen & Boynton, 1991).

In the case of outsourcing, McFarlan and Nolan (1995) claimed that the more IT development and operations are already segregated in the organization and in accounting, the easier it is to negotiate an enduring outsourcing contract. A stand-alone differentiated IT unit has

already developed the integrating organizational and control mechanisms that are the foundation for an outsourcing contract. Outsourcing as a way of cost reduction in IT is widely cited in the literature (Buck-Lew, 1992; McFarlan & Nolan, 1995; Nellorea & Soderquist, 2000; Barthelemy, 2003; Holcomb & Hitt, 2007). Therefore, it can be concluded that IT structure also has an impact on cost-cutting activities.

Senior Management Support

A recent survey among Swedish CIOs showed that the second most pertinent concern of CIOs is to improve the quality of the interplay between the IT organization and the business organization (Lindstrom *et al.*, 2006). The way IT is managed and its relationship to organization is an important issue. IT departments are better managed when there is top management commitment to the diffusion of innovations throughout the company (Jarvenpaa & Ives, 1991).

Senior management involvement increases the success rate of achieving a strategic impact through an IT (Lederer & Mendelow, 1988; Segars *et al.*, 1998; Min *et al.*, 1999; Hartono *et al.*, 2003). The alignment of the IT with the strategic objectives of the company increases when senior management takes an active role in the decisions about the IT (Kearns & Sabherwal, 2006). Such an alignment is crucial in achieving improved performance through the IT (Reich & Benbasat, 2000; Sabherwal *et al.*, 2001).

Ragowsky and Gefen (2008) argued that having a senior executive in charge of the IT operations means more resources can be allocated to IT activities and greater understanding on behalf of the IT department of the company's strategy. In the case of IT cost-cutting, some activities need great support form top management. Therefore, for effective cost-cutting activities senior management involvement in the procedure is essential.

Organizational Learning

According to Fiol and Lyles (1985), the organizational learning perspective considers organizations as cognitive entities capable of observing their own actions, experimenting to discover the effects of alternative actions, and modifying their actions to improve performance.

Organizations are seen as learning through processes that create new knowledge or modify existing knowledge. Specifically, there is a steady tension between exploration (that captures risk taking, experimentation, discovery, and innovation) and exploitation (that captures refinement, efficiency, selection, and execution) (March, 1991).

A number of researchers have studied the various aspects of IT from the perspective of organizational learning. Attewell (1992), for example, described the IT adoption process as a learning process. McFarlan and Nolan (1995) mentioned the organizational learning effect in outsourcing projects. Pentland (1995) argued that there is a close relationship between organizational learning and IT implementation. Scott and Vessey (2000) studied Enterprise Resource Planning (ERP) system implementation failure from the organizational learning perspective and Phang *et al*. (2008) investigated organizational learning in e-government projects.

McFarlan and Nolan, (1995) argued that a firm with substantial experience in restructuring will have less difficulty in defining the dividing line between the outsourcer and the company in terms of responsibility for success. Firms that have not yet worked on these projects will find that outsourcing significantly complicates an already difficult task. The more experience the firm has had in implementing these projects, the easier the outsourcing will be. As mentioned before, outsourcing as a way of cost reduction in IT is widely cited in

the literature (Buck-Lew, 1992; McFarlan & Nolan, 1995; Nellorea & Soderquist, 2000; Barthelemy, 2003; Holcomb & Hitt, 2007). Therefore, cost-cutting activities may also be addressed from an organizational learning perspective. Some cost cutting activities in IT may lead to change the way that works are done. Hence, an organization wishing to implement such activities must engage in organizational learning and the past experiences affect the successful implementation of new ones.

Cost-Cutting Techniques in IT

There are few literatures available on cost containment in IT and most of them have been published in recent years. This is a sign that this issue is still in its early stage and need more attention from scholars and academicians of the field. A few authors suggested different forms of actions for cutting costs in IT. Bolar (2001) proposed six budget-saving strategies for IT projects. His strategies are more on managerial issues of cost containment and less on the technical part. Goldstein *et al.* (2004) study's on the CIOs of higher education institutions provided 14 cost containment strategies. In another study by Weinberg (2008) 20 recommendations for cutting IT costs are suggested. It includes a combination of technical and managerial recommendations. The other work has been done by Shinder (2008). She offered 10 ways for trimming IT budget in technical and managerial ways. Padilla (2008) work also proposed some advices to cut the IT costs. However, it seems that Gartner (2006) work on cost containment techniques is the most comprehensive work available to address this issue. This study suggested 25 cost containment techniques in IT in different technical and managerial forms. Based on his study, cost containment techniques can be classified in three groups which include: (a) linking costs to demand, (b) reducing resource costs, and (c) changing operating practices.

To provide a comprehensive list of cost containment techniques from the few literatures in the area of cost cutting in IT, a summary of cost containment techniques has been analyzed and then synthesized in Table (1) based on the Gartner's (2006) work. The following provided a brief description of each group of techniques.

1) Linking costs to demand: IT costs are demand-driven. Managing demand is one way to contain IT costs. Although the mechanisms vary, most aim to provide more cost information to IT users so they can manage their own demand for IT services and help set priorities on IT investments. One way to reduce costs is to stop doing something. Determining which IT activities and projects to stop makes for difficult decisions.

2) Reducing resource costs**:** labor and technology are the two largest IS cost components.

3) Changing operating practices: unnecessarily complex IT operating models and lack of formal business practices leave room to squeeze costs and gain other benefits. Implementing disciplined management processes in the IT organization can reduce costs, improve service levels and reduce risks.
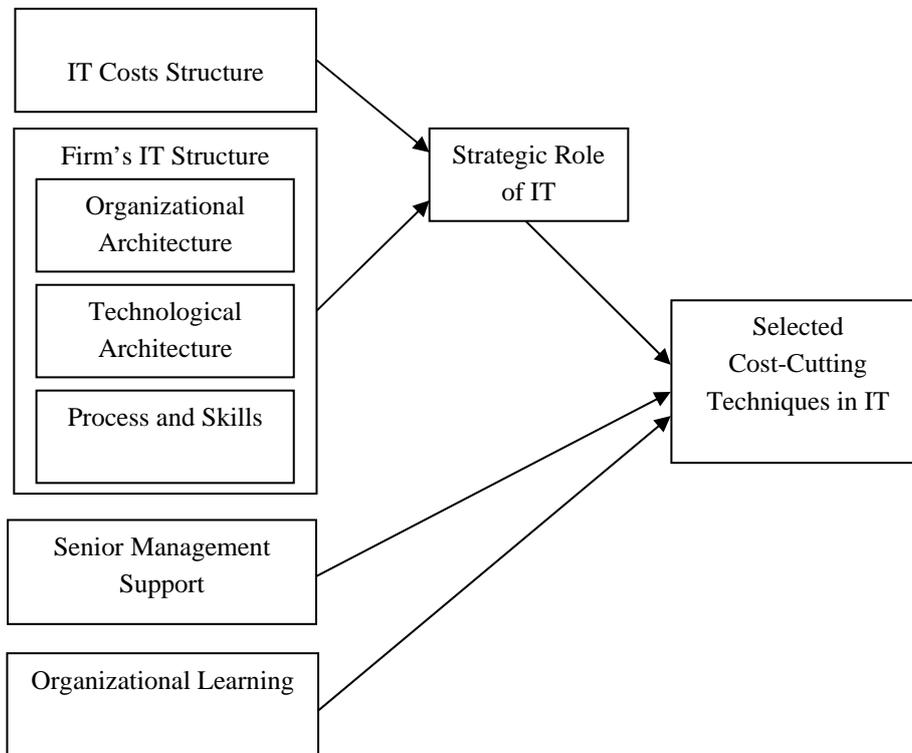
The Proposed Conceptual Framework

There is no doubt that using a practical cost-cutting approach is said to be essential for an effective cost-cutting plan in an organization. This approach includes identification of necessary factors that influence the success of the process. It helps IS professionals in a firm to arrange their cost-cutting activities in the most effective way.

It is predicted that depending on the strategic relevance of IT to a firm IT structure and its cost structure may vary. Moreover, senior management support and organizational learning have direct impact on cost-cutting. Therefore, the conceptual framework of this study can be proposed as Figure (2).

Table 1. Cost Containment Techniques in IT

		Techniques	Gartner (2006)	Padill (2008)	Shinder (2008)	Weinberg (2008)	Goldstein et al. (2004)	Bolar (2001)
Group 1	1	Chargeback	✔				✔	✔
	2	IT Project Management Office (PMO)	✔					✔
	3	IT Governance	✔				✔	✔
	4	Contingent Workers	✔			✔	✔	
	5	Software as a Service (SaaS)	✔			✔	✔	
	6	Capacity-on-demand (CoD)	✔	✔	✔			
Group 2	7	Staff Reconfiguration	✔		✔	✔	✔	
	8	Selective Outsourcing	✔	✔	✔		✔	
	9	Offshore Outsourcing	✔	✔	✔		✔	
	10	Automated Software Distribution	✔					
	11	Server/storage Virtualization	✔		✔	✔	✔	
	12	Voice/data Network Reengineering	✔		✔	✔	✔	
	13	Voice over Internet Protocol (VoIP)	✔			✔	✔	
	14	Open-source Software (OSS)	✔		✔		✔	
Group 3	15	Data Center Consolidation/Automation	✔	✔	✔	✔		
	16	Standard Operating Environment	✔			✔		
	17	Teleworking	✔			✔		
	18	Refresh/Upgrade Delay	✔		✔	✔	✔	✔
	19	Asset/License Management	✔			✔		
	20	Print Fleet Rationalization	✔			✔		
	21	Telephone Expense Management	✔			✔		
	22	Telephone Bill Audit	✔					
	23	Contract Renegotiation	✔			✔		✔
	24	IT operations Process Improvement	✔			✔		
	25	Application Development Process Improvement	✔				✔	

Figure 2. The Proposed Conceptual Framework for Strategic Cost-Cutting in IT

Conclusion

The purpose of this research is to provide a concrete framework to help senior managers/CIOs think about IT cost-cutting activities and focus on how to strategically manage these activities to ensure their firm's success in today's turbulent business environment. The literature review revealed that the strategic role of IT in organizations, IT costs structure, firm's IT structure, senior management support and organizational learning is the important factors that affect the cost-cutting techniques selection in IT. Further studies need to focus on applying the conceptual framework proposed in this research in different context, industries and population. This will robust the result

of this study and will help the practitioners in their IT cost-cutting technique selection. CEOs and CIOs can use the results to take the necessary steps to cut their costs in IT while still providing high-quality service and support for business growth and maximize business value from IT spending.

References

Accenture (2008). Strategic Cost Reduction Delivering high performance IT in an economic downturn, www.accenture.com.

Allen, B.R., & Boynton, A.C. (1991). Information architecture: in search of efficient flexibility, MIS Quarterly, 15 (4), 435–446.

Applegate, L. M., Austin, R.D., & McFarlan, F.W. (2005). *Corporate Information Strategy and M anagement*, *Text and Cases*, Boston, MA; McGraw-Hill Irwin.

Attewell, P. (1992). Technology diffusion and organizational learning: The case of business computing. *Organization Science*, 3, 1-19.

Barthelemy, J. (2003). The seven deadly sins of outsourcing. *Academy of Management Executive*. 17 (2), 87-100.

Belleflamme, P. (2001). Oligopolistic Competition, IT Use for Product Differentiation and the Productivity Paradox. *International Journal of Industrial Organization*, 19, 227-248.

Bergeron, F., Raymond, L., & Rivard, S. (2004). Ideal patterns of strategic alignment and business performance. *Information & Management*, 41, 1003–1020.

Bolar, S. (2001). Six budget-saving strategies for an IT Project. www.articles.techrepublic.com.

Brown, C.V., & Magill, S.L. (1994). Alignment of the IS function with the enterprise: toward a model of antecedents. *MIS Quarterly*, 18 (4), 371–403.

Brown, C.V., & Magill, S.L. (1998). Reconceptualizing the context design issue for the information systems function. *Organization Science*, 9 (2), 176–194.

Buck-Lew, M. (1992). To Outsource or Not?. *International Journal of Information Management*, 12 (1), 3-20.

Cohen, J. F. (2003). Explaining information systems strategic planning (ISSP) behavior: an empirical study of the effects of the role of IS on ISSP. In *Business Strategies For information Technology Management*, K. Kangas, Ed. IGI Publishing, Hershey, PA, 226-241.

Devaraj, S., & Kohli, R. (2000). Information Technology Payoff in the Healthcare Industry: A Longitudinal Study. *Journal of Management Information Systems*, 16 (4), 41-67.

Earl, M.J. (1989). *Management Strategies for Information Technology* , Prentice-Hall International (UK), London, UK.

Ein-Dor, P., & Segev, E. (1982). Organizational context and MIS structure: some empirical evidence. *MIS Quarterly*, 6 (3), 55–68.

Ezingeard, J-N, Irani, Z., & Race, P. (1999). Assessing the value and cost implications of manufacturing information and data systems: an empirical study. *European Journal of Information Systems*, 7 (4), 252–260.

Fiedler, K.D., Grover, V., & Teng, J.T.C. (1996). An empirically derived taxonomy of information technology structure and its relationship to organizational structure. *Journal of M anagement Information Systems*, 13 (1), 9–34.

Fiol, C.M., & Lyles, M.A. (1985). Organizational learning. *Academy of Management Review*, 10 (4), 803–813.

Gartner (2006). *Spend Less, Get More: 25 IT Cost Containment Techniques*. Gartner Inc., Oct 2006.

Goldstein, P., Gonick, L. S., Huish, D. S., Lambert, H. D., Lea, L. T., Pritchard, W. H., Siff, F. H., Smallen, D. L., and Steinbrenner, K. (2004). Doing More with Less: Obstacle or Opportunity for IT?. *EDUCAUSE Review*, Nov/Dec 2004.

Hartono, E., Lederer, A. L., Sethi, V., & Zhuang, Y. (2003). Key Predictors of the Implementation of Strategic Information Systems Plans. *Database for Advances in Information Systems* , 34 (3), 41-53.

Heo, J., & Han, I. (2003). Measure performance of information systems (IS) in evolving computing environments: An empirical investigation. *Information and Management*, 40 (4), 243–256.

Hitt, L., & Brynjolfsson, E. (1996). Productivity, Business Profitability and Consumer Surplus: Three Different Measures of Information Technology Value. *MIS Quarterly*, 20 (2), 121-142.

Hochstrasser, B. (1990). Evaluating IT investment—matching techniques to projects. *Journal of Information Technology*, 5 (4), 215–221.

Holcomb, T.R., & Hitt, M.A. (2007). Toward a model of strategic outsourcing. *Journal of Operations Management*, 25, 464–481.

Holsapple, C.W., & Luo, W. (1996). A framework for studying computer support of organizational infrastructure. *Information & Management*, 31(1), 13–24.

Irani, Z., Ezingeard, J.-N., & Grieve, R.J. (1997). Integrating the costs of a manufacturing IT/IS infrastructure in the investment decision-making process. *Technovation*, 17 (11/12), 695–706.

Irani, Z., Ghoneim, A., & Love, P.E.D. (2006). Evaluating Cost Taxonomies for Information Systems Management. *European Journal of Operational Research*, 173 (3), 1103-1122.

Irani, Z., Sharif, A.M., & Love, P.E.D. (2001). Transforming failure into success through organizational learning: an analysis of a Manufacturing Information System. *European Journal of Information Systems*, 10 (1), 55–66.

Irani., Z., & Love, P.E.D. (2001). The propagation of technology management taxonomies for evaluating investments in information systems. *Journal of Management Information System*, 17 (3), 159–175.

Jarvenpaa, S.L. & Ives, B. (1991). Executive Involvement and Participation in the Management of Information Technology. *MIS Quarterly*, 15 (2), 205-227.

Jiang, J.J. & Klein, G. (1999). Project selection criteria by strategic orientation. *Information and Management*. 36, 63-75.

Joshi, K., & Pant, S. (2008). Development of a framework to assess and guide IT investments: An analysis based on a discretionary–mandatory classification. *International Journal of Information Management*, 28 (3), 181-193.

Kauffman, R.J., & Kriebel C.H. (eds.) 1988. Modeling and measuring the business value of information technologies. In *Measuring the Business Value of Information Technologies*, ICIT Research Study Team #2, ICIT Press, Washington D.C.

Kearns, G. S. & Sabherwal, R. (2006). Strategic Alignment between Business and Information Technology: A Knowledge-Based View of Behaviors, Outcome, and Consequences. *Journal of Management Information Systems*, 23 (3), 129-162.

Keen, P.G.W. (1991). *Shaping the Future: Business Design through Information Technology*. Harvard Business Press, Cambridge, MA.

Laudon, K. C., & Laudon, J. P. (2012). *Management information systems: managing the digital firm* (12th Ed.). Prentice Hall.

Lederer, A.L., & Mendelow, A.L. (1988). Convincing Top Management of the Strategic Potential of Information. *MIS Quarterly*, 12 (4), 525-534.

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. *Information and Management*, 40 (3), 191–204.

Leifer, P. (1988). Matching computer-based information systems with organizational structures. *MIS Quarterly*, 12 (1), 63–74.

Lindstrom, A., Johnson, P., Johansson, E., Ekstedt, M., & Simonsson, M. (2006). A survey of CIO concerns-do enterprise architecture frameworks support them?. *Information Systems Frontiers*, 8, 81–90.

Mahadevan, B. (2000). Business Models for Internet-Based E-Commerce: An Anatomy. *California Management Review*, 42 (4), 55-69.

March, J.G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2 (1), 71–87.

McFarlan F.W., McKenney, J.L., & Pyburn, P. (1983). Information archipelago-plotting a course. *Harvard Business Review*, 61(1), 145-156.

McFarlan, F.W. (1984). A portfolio approach to information systems. *Harvard Business Review*, 62 (3), 98-103.

McGee, K., Raskino M., & Lopez, J. (2008). Cost Cutting in IT. Gartner Inc., Feb 2008.

Min, S.K., Suh, E.H., & Kim, S.Y. (1999). An Integrated Approach toward Strategic Information Systems Planning. *Journal of Strategic Information Systems*, 8 (4), 373-394.

Mukhopadhyay, T., Kekre, S., & Kalathur, S. (1995). Business Value of Information Technology: A Study of Electronic Data Interchange. *MIS Quarterly*, 9 (2), 137-156.

Nellorea, R., & Soderquist, K. (2000). Strategic outsourcing through specifications. *Omega*, 28, 525-540.

Nolan, R. & McFarlan, F.W. (2005). Information Technology and the Board of Directors. *Harvard Business Review*, 83(10), 96-106.

Padilla, R. (2008). Cutting costs in IT the creative way. www.techrepublic.com.

Paula, D. and Laurence, L. (1997). Control of the information systems function: The role of cost allocation, in: *Proceedings of the 4th European Conference for IT Evaluation*, University of Delft, The Netherlands.

Pentland, BT. (1995). Information systems and organizational learning: The social epistemology of organizational knowledge systems. *Accounting, Management and Information Technologies*, 5 (1), 1-21.

Phang, C.W., Kankanhalli, A., & Ang, C. (2008). Investigating organizational learning in eGovernment projects: A multi-theoretic approach. *Journal of Strategic Information Systems*, 17, 99–123.

Porter, M.E. & Millar, V.E. (1985). How information gives you a competitive advantage. *Harvard Business Review*, 149-160.

Premkumar, G. & King, W.R. (1992). An Empirical Assessment of Information Systems Planning and the Role of Information Systems in Organizations. *Journal of M anagement Information Systems*, 9 (2), 99-126.

Ragowsky, A. & Gefen, D. (2008). What Makes the Competitive Contribution of ERP Strategic. *The DATA BASE for Advances in Information Systems*, 39 (2), 33-49.

Reich, B.H., & Benbasat, I. (2000). Factors that Influence the Social Dimension of Alignment between Business and IT Objectives. *MIS Quarterly*, 24 (1), 81-113.

Revenaugh L. (1994). Corporate Culture and the Strategic Grid: Preparing for the Implementation of a Strategic Plan, *Working Paper series, City Polytechnic of Hong Kong*, Hong Kong.

Sabherwal, R., Hirschheim, R., & Goles, T. (2001). The Dynamics of Alignment: Insights from a Punctuated Equilibrium Model. *Organization Science*, 12 (2), 179-197.

Scott, J.E., & Vessey, I. (2000). Implementing Enterprise Resource Planning Systems: The Role of Learning from Failure. *Information Systems Frontiers*, 2 (2), 213-232.

Segars, A.H., Grover, V., & Teng, J.T.C. (1998). Strategic Information Systems Planning: Planning System Dimensions, Internal Coalignment, and Implications for Planning Effectiveness. *Decision Sciences*, 29 (2), 303-342.

Shinder, D. L. (2008). 10 ways to trim your IT budget. www.techrepublic.com.

Umble, E. J., Haft, R. R., & Umble, M. M. (2003). Enterprise resource planning: implementation procedures and critical success factors. *European Journal of Operational Research*, 146, 241-257.

Weinberg, N. (2008). Cutting IT Costs: Gartner Recommends 20 Can't Miss Tips. *Network World*. www.cio.com.