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The Impact of Internal Entrepreneurship on IS Implementation

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ABSTRACT

This paper is motivated by the reported poor performance of IS implementations. In contrast to the dominant emphasis on formal approaches such as structured methods, this paper takes a position drawing upon research in management science, organizational science and psychology. It focuses on key personal and organizational capabilities in the IS implementation project, and in particular, entrepreneurial ability. Entrepreneurship is first presented as an important organizational capability of innovation in management science and related fields. As a specialization of entrepreneurship, internal entrepreneurship can be defined as both a personal attribute and firm behavior. Linking it with IS implementation, this paper proposes that this phenomenon of internal entrepreneurship can affect the entire process of IS implementation. Therefore, greater interaction between IS and entrepreneurial studies derived from management science and related fields is desirable.

Keywords

IS implementation, internal entrepreneurship, strategic information management, measurement of IT value, IT capability

INTRODUCTION

For decades, the paradox between IT spending and performance has been puzzling practitioners and researchers. Although it can be anecdotally argued that IT is used in a more innovative and effective way than before, research suggests a continuing, severe waste of IT spending, i.e. between 30% and 40% of the projects did not realize the intended benefit (Willcocks & Lester, 2003). A mismatch between IT and business, a limitation in measurement methods, and the actual deficient operational and support characteristics of a system are often blamed for low IT performance (e.g. Brynjolfsson 1993; Willcocks & Lester, 2003).

However, with the growth of technology's power and ubiquity (Carr, 2003), it can be argued that the first two issues deserve more attention. In information systems (IS) literature, strategic information management research and the studies that analyze how IT impacts organizational performance tackle these two issues separately. However, through a review, these two streams were connected in the studies of what is known as 'IT capability'. Making links to more general notions of organizational capability, this paper argues that the chance of IS implementation success can be increased by considering internal entrepreneurship (IE) throughout implementation processes, and can then further improve IT performance by enhanced organizational IT capability. A summary of IS implementation studies, a discussion of the concept of IE and its linkage to IS are included in the paper. Several questions are raised in the conclusion.

STUDIES RELATED TO IT PERFORMANCE

Strategic Information Management

Earl (1996) defines the strategic information management (SIM) as a general management issue-set that potentially affects organizational effectiveness, including how to obtain IT strategic advantage, how to realize strategic IT alignment, how to arrange the IS function, how to manage user-specialist interaction, and how to design IT infrastructure (p.485). In SIM literature, some efforts have been made on the conceptual level in integrating information resources with organization, like Earl's (1996) organizational fit framework. Subsets of 'alignment' research can then be divided into the intellectual dimension and the social dimension (Reich & Benbasat, 2003). Research in the intellectual dimension focuses on examining the strategies, structure and planning methodologies. Conversely, research from a social perspective is interested in examining people's values, communications, and their understanding of each other's domain in the alignment process (Reich

& Benbasat, 2003). The systematic thinking that is implicit in the 'alignment' literature does not necessarily apply in practice. For instance, research about strategic information systems planning (SISP) found that few companies systematically compare plan and performance, and evaluate the strategic effects on an organizational or a business process level. In contrast, companies prefer an ongoing organization-wide informal strategy-making process (Smits, Poel, & Ribbers, 2003).

Although it was perceived that successful SIM implementation depends on alignment of people, technology and organization, such alignment hardly exists. In a study of 86 UK companies, only two of them were credited with having 'aligned' (Willcocks & Lester, 2003). One reason for the low rate of alignment is that SIM is context dependency. Organizations on the different levels of IT maturity need to apply different IS strategies (Galliers & Sutherland, 2003). More specifically, alignment failure is due to incompatibility between business strategy and IT capability, either 'technology shortfall' or 'strategy shortfall' (Tallon & Kraemer, 1998). 'Technology shortfall' refers to the situation when an organization's IT capability fails to provide adequate support for its business strategy, while 'strategy shortfall' appears when an organization's business strategy fails to take full advantage of the existing IT capability. Thus, it will be worthwhile to look into 'IT capability' in order to explore ways of fostering this elusive 'alignment'.

Measurement of IS value

The "IS productivity paradox" refers to the difficulty of discovering where IS payoffs have occurred (e.g. Brynjolfsson, 1993; Willcocks & Lester, 2003). It has been clear that the value of technology depends on internal and external factors, including complementary organizational resources, its trading partners, and the macro environment (Melville, Kraemer & Gurbaxani, 2004). Numerous efforts have been made to incorporate these variables (e.g. Martinsons, Davison, & Tse, 1999). However, in practice, the issue in evaluating IS performance remains because the interactions of organizational variables (Melville et al., 2004) and difficulties with quantifying intangible costs and benefits (Hitt & Brynjolfsson, 1994). For instance, Murphy and Simon (2002) found that the derived benefits from IT investment, such as positive effect of staff training on firm performance were ignored.

Increasingly, researchers propose to evaluate IT investment from a resource-based view (e.g. Bharadwaj, 2000, Melville et al., 2004). The resource-based view illuminates IT business value in two ways. First, IT business value is embedded in organizational capability (Melville et al., 2004). For instance, the value of technology is reflected in the accumulation of knowledge because IT infrastructure maximizes knowledge assets by facilitating an organization to capture, reconcile, and transfer knowledge in an efficient manner (Gold, Malhotra, & Segars, 2001). Secondly, IT business value is process-based (Melville et al., 2004). The performance of IT is subject to IT management effectiveness (Soh & Markus, 1995) and organizational learning process (Brynjolfsson, 1993).

DEFINING IT CAPABILITY

From a resource-based view, costly-to-copy attributes of a firm are considered as the fundamental drivers of performance (Rumelt, 1987). Arguing that there are conceptual links between IT capability and firm performance, Bharadwaj (2000) defines a firm's IT capability as an enterprise-wide ability to mobilize and deploy IT-based resources and other capabilities to obtain competitive advantage. Bharadwaj (2000) argued that the inconsistent statistical findings about the relationship between IT and firm performance are due to an incomplete understanding of the nature of a firm's IT resources and skills. A positive relationship between IT capability and financial performance was confirmed by Santhanam and Hartono (2003). The idea of 'IT capabilities' comprises at least three components: physical IT infrastructure, human IT resources and IT-enabled intangibles (Bharadwaj, 2000). IT infrastructure refers to the computer and communication technologies, the IT platforms and databases across the enterprise. Firms can achieve advantage by launching innovative IT applications faster than competitors. However, such advantages are relatively easy-to-copy (Carr, 2003). The second component, human IT resources, enables firms to conceive of and implement such applications faster than competitors. It includes technical IT skills and managerial IT skills. Technical skills can be either purchased from the outside or acquired through training, while managerial skills are often developed over time. Managerial IT skills refer to management's ability to create, develop, and use IT applications, including project management, leadership skills and innovative ability. They are tacit and hard-to-imitate (Mata, Fuerst, & Barney, 1995). The third component IT-enabled intangibles are pre-existing firm resources and skills, including customer orientation, knowledge assets, and synergy (i.e. the sharing of resources and capabilities across organizational divisions). Among them, 'synergy' is context-dependent and less likely to be imitated (Bharadwaj, 2000).

The discussion about how to develop IT capability focuses on enhancing managerial IT skills and improving synergy. For instance, Rockart, Earl and Ross (1996) presented eight imperatives regarding establishment of overall IT capability through organizational arrangements. They especially emphasized line management's assumption of a co-leadership role for IT. They asserted that the firms who fail to address these imperatives, or who are unable to convince line management to undertake its

leadership role in both IT-enabled strategy development and system implementation, will be unable to support their organizations in a fast-changing world (p.29). Similarly, Feeny and Willcocks (1998) identify nine core IS capabilities. Some drivers for developing the capabilities are: a pattern of CIO-type positions in the business leadership structure of the corporation; a number of business systems thinkers as a function of business development projects active within the organization; a clearly identified relationship builder who devotes to develop and maintain constructive business/IS relationships within each operational unit. Also, Bharadwaj (2000) suggests that firms need to create a social context and reward system to encourage sharing. In summary, these studies imply that high IT capability relies on the existence of business and IT leadership at different levels of management. This may involve experts who understand both business and IT, and formal arrangements for increasing the accessibility of resources.

PERSPECTIVES ON IS IMPLEMENTATION

IS implementation is diffusion of technological innovation (Cooper & Zmud, 1990). Organizational efforts directed toward the implantation and acceptance of appropriate IT within a user community is essentially consistent with the broader idea of a diffusion of innovation (DOI) (Rogers, 1995). Pursuing this view, it quickly develops to emphasize the necessity of a technology being compatible with the organization and its tasks (Bradford & Florin, 2003).

IS implementation consists of several phases. It starts with scanning of organizational problems/ opportunities and correspondent IT solutions, followed by interactions with a user community in the organizational context. Increased organizational effectiveness by using IT is expected as a result (Cooper & Zmud, 1990). Swanson (1994) proposed a tri-core model by the nature of technological innovation, i.e. information, administrative and technical cores. The degree of change varies in three categories from incremental to radical (for a detailed explanation refers to Ryan & Harrison, 2000). With the development of technology, it can be argued that nowadays technical core innovations deserve more attentions. A typical example of this category is an ERP system. As complex IT, end users are comparatively more involved in ERP implementation (Jones & Price, 2004). Successful ERP implementation must be encapsulated as some perception of high quality of use (Boudreau & Seligman, 2005). However, it seems hard to define the end of the infusion process for ERP system (Cooper and Zmud, 1990) as ERP benefits are realized by ongoing efforts to continuously improve process (Ross, 1999). Thus, during the implementation process, organizational and managerial efforts are made to promote novel behaviors among end-users to encourage innovative use of system as well as to reduce the forces opposing successful implementation (Yetton, Sharma, & Southon, 1999).

Key Roles in IS Implementation

In the discussion of IS implementation, there are two foci: the role of the institution and the role of individual.

As IS research considers a changing entity within its environment, an understanding of the broader social context where the implementation of a system took place is crucial (Myers 1994). Research streams considering organizational context include the web model analysis elaborating the social effects of IS innovation in organizations (e.g. Kling, 1987), the soft systems methodology analyzing IS in human activity systems (Checkland, 1999), and structural analyses of IT revealing the duality of technology (Orlikowski, 1992).

The organizational context affects end-users' ability and motivation to adopt and use IS successfully (Sharma & Yetton, 2003). Contextual factors include work procedures, reward systems, and control and coordination mechanisms (Orlikowski, 1992). They are organizational constraints on IS implementation. Meanwhile, the organizational context can be reshaped in the ways of facilitating successful IS implementation during the change process (Sharma & Yetton, 2003). For instance, accumulated knowledge from past implementation experience can be stored in the organizational memory, and hence can further affect work process.

The other focus of implementation is individual: both upon a single person and a group of people. Organizational benefits come from sequential or reciprocal combinations of individual behavior (Yetton et al, 1999). A number of studies indicate that managerial commitment is critical in coping with the contingencies that appear during implementation stages (e.g. Mata et al 1995, Yetton et al, 1999). Moreover, Lockett (1996) applied DOI factors to IS projects. He found that 'a strong project champion in a business area' is critical to successful implementation. Although 'good understanding of end-user needs by system developers' and 'senior management sponsorship and commitment' are also important, they both depend on the existence of a champion (Lockett, 1996).

Obviously, institutional context and members in the organization cannot be separated. Although researchers may start their exploration with either view, institution and individuals are often found to be interrelated with each other in the same study. For instance, Orlikowski et al. (1995) unveiled that a system's use was significantly influenced by the activities of a few

individuals who shaped the users' interaction with the conferencing technology, modified features of the technology, and altered the context of use (p.423).

DEFINING INTERNAL ENTREPRENEURSHIP

There are three focal areas in the study of IE: individual internal entrepreneurs, entrepreneurial organization and new business venture creation (Antoncic & Hisrich, 2001). As the discussion is about IS, this paper will emphasize the first two focal areas. Research regarding individual internal entrepreneurs addresses the individual characteristics of internal entrepreneurs, and recognition and support of entrepreneurs in organizations, while research about entrepreneurial organization emphasizes the characteristics of such organizations (Antoncic & Hisrich, 2001). Clearly, IE exists on both individual and organizational levels. To clarify the idea of IE, it is necessary to identify its interrelated studies and draw a scope for the concept.

Scope of the Concept

Capabilities and internal entrepreneurship

Companies that possess inimitable capabilities achieve competitive advantage. Capabilities involve integrating resources and activities across value chains of organizational business (Antoncic & Hisrich, 2003). Such capability may be due to its idiosyncrasy (e.g. loyalty), or path dependencies in a firm's culture (Teece, Pisano & Shuen, 1997). Entrepreneurship can be viewed as a unique resource of capability that assists organizations to sustain competitive advantage because entrepreneurs can support new business creation with their novel ideas (Rumelt, 1987), improve the organization through change initiation (Mintzberg, 1973), and coordinate resources to create profits (Vesper, 1983). As a specialization of entrepreneurship, IE is considered as a manifestation of organizational innovative capabilities (Antoncic & Hisrich, 2003). Antoncic and Hisrich (2003) attempted to differentiate IE from capabilities. They assert that the key difference is that searching for organizational inter-business coherence and synergy is not a key concern of IE (Antoncic & Hisrich, 2003).

However, this differentiation does not seem obvious. As an individual, an internal entrepreneur is a courageous, moderate risk-taker, working hard to reduce project risk by locking up a distribution channel, forming a key partnership, and guarantee the availability of resources (Pinchot & Pellman, 1999). Since 'partnership from top management' plays a key role in successful IE activities (Pinchot, 1985), a big picture of the whole business usually lies embedded in the mind of projects' sponsors. On the firm level, self-renewal and proactiveness are two dimensions of IE (Antoncic & Hisrich, 2003). 'Self-renewal' refers to the role of IE in strategy reformulation, reorganization and organizational change. 'Proactiveness' reflects top management's tendency to pursue enhanced competitiveness (Antoncic & Hisrich, 2003). Thus, an organization as a coherent entity is considered in the IE activities, and IE is a resource of organizational innovative capability.

Organizational learning and internal entrepreneurship

Organizational learning is an organizational process directing action by enabling the intentional and unintentional acquisition of, access to, and revision of organizational memory (Robey, Boudreau & Rose, 2000). Organizational learning facilitates knowledge acquisition and retention, and helps to improve organizational efficiency and effectiveness. However, learning often cannot begin until unlearning has taken place (Burgelman, 1983). Thus, learning requires 'creative tension' (Senge, 1990). It can be understood as a vision of the future enabling a company to realize its current position and sense the pressure of change. This process is proactive rather than adaptive (Irani & Love, 2003).

IE can facilitate organizational learning by creating disruptions. During the learning process, internal entrepreneurs can perceive and apprehend new opportunities based on new capabilities. The results of their actions provide the basis for reformulating a firm's strategy, and maintaining and further developing the firm's distinctive competence (Burgelman, 1988, p.83). Meanwhile, a reverse loop from learning to IE also exists. An organization can learn how to be entrepreneurial from its past experience with IE activities and, therefore, assist its growth (Antoncic & Hisrich, 2003). Moreover, organizational learning can be viewed as a function of absorptive capacity that consists of prior knowledge base and intensity of effort (Kim, 1998). Absorptive capacity requires learning capability and develops problem-solving skills. Learning capability refers to the capacity to assimilate knowledge for imitation, while problem-solving skills represent a capacity to create new knowledge for innovation (Kim, 1998). Hence, the ideas of organizational learning and IE are interlinked when IE is a process that evolves over time.

Personal Attributes and Internal Entrepreneurship

There are different views in the studies of individual characteristics of internal entrepreneurs. The debate lies in whether the studies of the psychological characteristics contribute to the understanding of entrepreneurship when the psychological

characteristics of entrepreneurs vary greatly (Sexton & Bowman, 1986). Some researchers suggest that research efforts should be focused upon identifying what context moderate the effects of the entrepreneur's behavior or performance (e.g. Stevenson, 1985), while others insist that a comparative study based on a large sample can clarify those psychological characteristics (Sexton & Bowman, 1986). However, in their study, Sexton and Bowman (1986) admitted that the validity and reliability of personality index was not established by large sample and the combination of two measurement instruments (p.50). In contrast to this 'born-to-be' view, other researchers believe internal entrepreneurship can be learned. Drucker (1985) regards entrepreneurship as a question of doing and conducting. It relates to some actions and specific skills which can be observed, learned and assessed. However, considering difference existing in personalities, this paper argues that potential individuals can be inspired to be internal entrepreneurs by learning entrepreneurial skills.

In the literature, internal entrepreneurs have both leadership and management skills. Ross and Unwalla (1986) declared that intrapreneurs are people who are capable of: mastering the fundamentals of professional management; transcending the bureaucracy, encouraging an innovative climate and influencing their employees (p.47). Ross and Unwalla's discussion about IE is still on a senior management level, while Pinchot (1985) and Oden (1999) extend the idea across the levels of the organization. Both of them try to identify the skills of successful internal entrepreneurs. However, a challenge remains in integrating 'freedom to act' required by internal entrepreneurs and formal control system to maintain organizational focus (Meyer & Heppard, 2000). So before providing firms sustainable advantage, new capabilities must evolve over a long process through careful selection and nurturing (Burgelman, 1988). Oden (1997) declares that innovation and IE must be supported by an innovative corporate culture consisting of value, beliefs, and management style. Also, Burgelman (1988) suggests that top management should foster an 'intrapreneurial' culture by establishing formal reward system for entrepreneurial activities to enhance organizational capabilities.

Linkages between IE and IS Implementation

There are different definitions of IE. The main difference amongst these definitions is whether IE is a process or phenomenon within an organization or attributes of people on individual and group levels. IE can be linked to IS implementation on these two levels (Table 1).

On the individual level, Pinchot (1985) defines the internal entrepreneurs as "dreamers who do". They perceive and apprehend new IT opportunities. Meanwhile, they are also willing to take responsibilities, obtain support and resources, and lead a project team to success (Pinchot, 1985; Ross and Unwalla, 1986). They work not only as professional managers, but also as key characters in innovation diffusion process, including opinion leader, change agent, and project champion (Rogers, 1995). All these roles, especially project champion (Lockett, 1996), are critical to IS implementation.

On the firm level, IE reflects innovativeness, risk-taking, proactiveness (Covin & Slevin, 1991). A firm with entrepreneurial ability provides an innovative climate. It encourages its members to take risk and reflect on their past experiences. In this case, IS implementation can benefit from easy-to-access resources. Furthermore, IE is process-based (Burgelman, 1988; Antoncic & Hisrich, 2001). An organization that keeps IE as its organizational capability has a formal mechanism for evaluating IS projects that enables on-going learning process.

CONCLUSIONS

It follows that differently to the focus of traditional methodological research, this study proposes a new avenue in the exploration of IS implementation. Considering IS implementation as a social process, the study puts IE in the centre of analysis. The paper proposes that IE is not only part of the organization's pre-existing settings, but also can affect the entire process of IS implementation. A strong linkage is envisaged between internal entrepreneurial ability and IS implementation success in a broad sense.

Looking ahead, certain key propositions require further research:

- Successful IS implementation will be associated with the entrepreneurial skills of key individuals.
- Successful IS implementation will be associated with organizational contexts that promote greater internal entrepreneurship.
- The role of internal entrepreneurship changes during the process of IS implementation.

It lies in prospect that, rather than develop coherent and logical methodological frameworks, IS success is more associated with environments in which individuals are able to play the role of the internal entrepreneur. Indeed one paradox might be that the traditional emphasis on formal approaches such as structured methods actually lessens the organizational amenity to IE (the second of our propositions above).

Perspectives	Attributes	Description	Entrepreneurship & IE literature	IS & DOI literature	Linkages to IS
Personal attributes	Professional manager	Capability of planning, organizing, controlling, communicating, and rational decision making	Pinchot (1985); Ross & Unwalla (1986); Oden (1997); Pinchot & Pellman (1999)	Meta et al(1995); Rockart et al(1996); Yetton et al(1999); Feeny & Willcocks (1998)	Perceive and apprehend IT opportunities and understand business process; Obtain sponsorship and resource across boundaries; Facilitate knowledge sharing on the team; Build relationship between users and designers and lead IS project.
	Opinion leader	Open to external communication	Pinchot (1985); Ross & Unwalla (1986); Burgelman (1988); Pinchot & Pellman (1999)	Rogers(1995); Feeny & Willcocks (1998)	
	Change agent	Transcends the bureaucracy	Pinchot (1985); Ross & Unwalla (1986); Oden (1997); Pinchot & Pellman (1999)	Rogers (1995); Orlikowski et al, (1995); Feeny & Willcocks (1998)	
	Project champion	Actively involve in the project; coordinate the project and guide it towards business goals; gather support for the project	Pinchot (1985); Pinchot & Pellman (1999)	Markus (1983); Rogers (1995); Lockett (1996);	
Firm Behavior	Innovative	Activities of seeking creative or unusual solutions to problems and needs	Covin & Slevin (1991); Antoncic & Hisrich (2001);	Cooper & Zmud (1990); Ross (1999); Yetton et al(1999);	Provide innovative climate and encourage novel use of IS; Integrate resources for IT-based business process change; Assess IS projects formally and encourage learning from past experience.
	Risk taking	Willingness of management to commit significant resources to opportunities facing uncertainty		Ross (1999)	
	Proactive	Firm's tendency to know what their competitive rivals are doing		Roney et al (2000); Irani & Love (2003); Jones & Price (2004)	
	Process-based	Process of uncovering and developing an opportunity to create value through innovation and seizing that opportunity		Cooper & Zmud, (1990); Jones & Price (2004)	

Table 1. Linkages between IS Implementation and IE on two Levels

The key is to see IS implementation as a task in organizational innovation. This linkage brings forth a much broader literature for IS researchers. From this it becomes possible to suggest direct extensions to the innovation literature, interpreting how it may be relevant to the pursuit of IS success. For instance, since internal entrepreneurs are usually operational and middle managers (Burgelman, 1983), they understand the business process from this perspective. If these managers take leadership role in strategy-making and system implementation, it can conceivably follow that organizations will have better IT capability (Rockart et al., 1996). In the initiation stage of an IS innovation, an organization with entrepreneurial spirit seeks opportunities for innovation (Covin and Slevin, 1991). Internal entrepreneurs are the driving force in perceiving and apprehending new opportunities based on new capabilities (Burgelman, 1988). It follows that through the stages of adoption, adaptation and acceptance, internal entrepreneurs do any job needed to make the project work without considering their job description (Pinchot, 1985). On the stages of routinization and infusion, to keep IE as organizational capability, organizations need to establish formal assessment and reward procedures for entrepreneurial success and failure (Burgelman, 1988). In this way, as these examples show, the broader theoretical base suggests new ways of exploring and researching the issues associated with IS projects.

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