Association for Information Systems
AIS Electronic Library (AISeL)

PACIS 2008 Proceedings

Pacific Asia Conference on Information Systems (PACIS)

July 2008

ORGANISATIONAL FACTORS AND THEIR ROLES IN CREATING IT BUSINESS VALUE

Guangming Cao
University of Ulster, g.cao@ulster.ac.uk

ORGANISATIONAL FACTORS AND THEIR ROLES IN CREATING IT BUSINESS VALUE

Abstract

Research on business value of information technology (IT) has recognised that organisational factors play critical roles in affecting how IT impacts on firm performance. However, the conceptualisation of organisational factors and their relationship with IT and firm performance has not been extensively developed in the literature. There is neither a coherent way of specifying organisational factors nor a consensus on how IT and organisational factors interact to affect IT business value. This paper, based on a change management perspective, understands IT adoption as a change that is likely to trigger significant changes in organisational factors, which in turn may affect IT business value either positively or negatively. Building on previous work in IT business value and change management, this paper presents a cross-disciplinary study of the relationship between IT and organisational factors. It classifies and maps organisational factors identified in the IT business value studies into four categories for the purpose of knowledge accumulation. It also develops propositions to further conceptualise the relationship between organisational factors and IT business value. Based on the analysis, this paper offers an explanation of how IT and organisational factors interact to affect business value and concludes with a discussion of the findings and future research.

Keywords: IT Business value, Organisational factors, Interaction, Change management.

INTRODUCTION

The business value of information technology (IT) has been studied for many years with mixed research results (Hitt & Brynjolfsson 1996, Weill and Olson 1989). While some studies argue this inconsistence is caused by methodological approaches (Kohli & Devaraj 2003), others have suggested that the extent of IT business value is determined by a number of organisational factors (Grant 2005, Melville et al. 2004) or by the degree of the fit between various contingency variables and variables of management information systems (Weill and Olson 1989). However, the conceptualisation of organisational factors and their relationship with IT and firm performance has not been extensively developed in the literature (Wade & Hulland 2004, Weill and Olson 1989). There is neither a consistent way of specifying organisational factors nor a consensus on how IT and organisational factors might interact to affect IT business value.

In addition, IT adoption is seen as an organisational change that may significantly transform organisational factors (Macredie & Sandom 1999) and is often associated with high implementation failures (Davenport 1998) or major project delays (Scott & Vessey 2002). All these make change management an important issue for the IT field (Gregor et al. 2006, Macredie & Sandom 1999, Sherer et al. 2003, Tillquist 2000) and the literature of change management relevant to the IT field. Therefore, this paper presents a cross-disciplinary study of organisational factors and their roles in creating IT business value, building on work in change management and IT business value. This approach is argued to provide valuable insights into understanding the relationship between IT and organisational factors (Orlikowski & Barley 2001).

This paper's main objective is to develop an understandings of IT business value by addressing the following two research questions: (1) What are the most important organisational factors that may affect IT business value? (2) How might IT and organisational factors interact to impact on firm performance? The distinctive feature of this study is to understand IT business value by centring on the interrelationship between IT and major organisational factors in a holistic way, rather than discussing how IT business value is affected by one or two specific organisational factors.

The remainder of this paper is organized as follows. The next section reviews IT business value literature to identify the research gap regarding organisational factors. It is followed by introducing a change management perspective to draw attention to the vital roles of organisational factors and their interaction in affecting IT business value. Then organisational factors identified in previous IT business value studies are classified and mapped into four categories, based on which the relationship between IT and organisational factors is discussed. Finally this paper offers an explanation of how IT and organisational factors interact to impact on firm performance by developing propositions and concludes with a discussion of the findings and future research.

1 ORGANISATIONAL FACTORS IN IT BUSINESS VALUE STUDIES

The relationship between IT and firm performance has been debated for many years. While a number of IT business value studies have strongly attributed large firm performance improvements or sustainable competitive advantage to IT (Santhanam & Hartono 2003); many have had mixed research findings (Hitt & Brynjolfsson 1996). For example, Hitt & Brynjolfsson (1996) indicate that the relationship between IT and competitive advantage is undetectable; yet IT is positively correlated to productivity and consumer value. Strassman (1997) on the contrary maintains that claims that IT increases productivity are deceptive: there is no relationship between IT investments and corporate profits.

While some studies argue that this inconsistency can be attributable to varied sample sizes, data sources, industries investigated and use of inappropriate measures of IT intensity (Brynjolfsson & Hitt

1996, Kohli & Devaraj 2003); a great many studies have suggested that IT does add business value but the extent of IT business value is contingent on a number of organisational or non-IT factors (Grant 2005, Melville et al. 2004, Wade & Hulland 2004), such as intangible human and business resources (Powell & Dent-Micallef 1997), shared knowledge between IT and customer service units (Ray et al. 2005), integration among business strategy, IT and organizational infrastructure and processes (Henderson & Venkatraman 1999), and the type of product development the IT supports, the market structure in which the firm competes, and the type of IT in which the firm invests (Thatcher & Pingry 2007).

The reasoning behind this line of argument is often provided by the resource-based view (RBV) (Barney 1991) and the contingency theory of management information systems (Weill and Olson 1989). The RBV holds that firm resources with certain characteristics will lead to sustainable competitive advantage. From the RBV, a firm's resources include all assets, capabilities, organisational processes, firm attributes, information, knowledge, etc., which can be classified into IT resources and non-IT resources. The firm may gain a resource-based competitive advantage when its resources are simultaneously valuable, rare, imperfectly imitable, and non-substitutable. Although IT resources alone are considered unable to meet these requirements, IT resources aligning with non-IT factors are seen to have these resource traits to form IT capabilities and become a source of sustainable competitive advantages (Grant 2005).

In tandem with understanding IT business value from the RBV, contingency theories originally developed in organisational research (for example, Fiedler 1964 and Kast and Rosenzweig 1973) have been adopted explicitly by some researchers to understand the interrelationships between various organisational and IT variables and organisational performance (for example, Becerra-Fernandez and Sabherwal 2001, Brown and Magill 1994, Khazanchi 2005, Panagiotis et al. 1999, Raymond 1990, Teo and Pian 2003, Umanath 2003, Weill and Olson 1989). While there is no consensus on the definition of a contingency model of management information systems (Weill and Olson 1989), the general assumption is that organisational performance is contingent on a number of variables: the better the "fit" (or the alignment) between these variables, the better the performance. However, it can be argued that many researchers in the IT business value domain have implicitly assumed certain types of contingency relationships between variables and organisational performance, often based on common sense (Umanath 2003).

Nevertheless, there are many empirical evidences supporting these conceptual explanations. For example, Bhatt and Grover (2005) verify that a firm's competitive position, though cannot be affected by IT infrastructure alone, can be significantly improved by combining the firm's IT business expertise and IT infrastructure together. Similarly, Santhanam and Hartono (2003) identify that IT capabilities developed by integrating IT infrastructure, human IT resources and IT-enabled intangible resources allow a firm to achieve superior financial performance while IT investment is not, or even negatively, correlated to firm performance. Ray et al. (2005) reaffirm that the context within which IT is applied is as important as IT itself and conclude that the performance variance can be explained by a complementary relationship between IT and organisational factors such as shared knowledge. Brynjolfsson et al. (2002) conclude that when IT resources are implemented together with structural decentralization, individual decentralization and team incentives, the combination "creates more value than the simple sum of their separate contributions".

The importance of organisational factors and their roles in the creation of IT business value may have been recognised by many studies; however research on organisational factors is rather underdeveloped in the literature (Wade & Hulland 2004), especially with regard to the following issues. First, although a diversity of non-IT or organisational factors have been identified in the literature; few studies seem to agree what they are or what factors should be considered in the creation of IT business value. For example, there are studies examining the relationship between IT and knowledge management (Ray et al. 2005), IT and organisational structures (Brynjolfsson et al. 2002, Hitt & Brynjolfsson 1997), IT and top management commitment (Wade & Hulland 2004) and IT and non-IT resources and organisational resources (Melville et al. 2004). Different studies have focused on quite different organisational

factors. There is neither a coherent way of specifying organisational factors, nor a consensus on what organisational factors should be considered in IT business value research. This makes it almost impossible to compare the impact of organisational factors on IT and to generalise from research findings to accumulate knowledge. Second, the interdependence of IT and organisational factors may have been acknowledged, but how they work together to affect business value has not been comprehensively conceptualised. For example, Kettinger et al. (1994) suggest that sustainable competitive advantage may be achieved by leveraging unique firm attributes with IT, but offer little guidance on how this might happen. Jarvenpaa and Leidner (1998) propose that IT can generate competitive value when IT leverages business and human resources. Yet, how these resources work together to create business value is not made clear. Finally, contingency models used in the IT business value studies are often criticised as being ill-defined (Umanath 2003, Weill and Olson 1989), functional, deterministic and narrowly focused (Weill and Olson 1989). Thus research on organisational factors and their roles in IT business value creation "needs to be a top priority of researchers" (Wade and Hulland 2004).

To address these issues and to facilitate knowledge accumulation, this paper argues that in the first place a classification of organisational factors is needed to allow researchers to coherently specify and organise various organisational factors and to compare them with one another. In addition, more research is needed to understand how IT and organisational factor work together to create business value. To find a way forward, this paper suggests that the literature of organisational change management may provide valuable insights to complement IT business value research. The reason is twofold. First, IT adopted in an organisation is likely to trigger significant changes for example in organisational processes, structure and culture (Macredie & Sandom 1999, Nault 1998). Second, IT success is contingent on IT working together with organisational factors as discussed previously; or IT success depends on complementary organisational changes such as process and structure redesign and culture alignment that support the IT use (Markus 2004). However, "identifying and implementing organizational co-inventions is difficult, costly, and uncertain, yielding both successes and failures" (Brynjolfsson 2003). These make organisational change management an important issue for the IT field (Gregor et al. 2006, Macredie & Sandom 1999, Sherer et al. 2003, Tillquist 2000) and signify the relevance of the change management literature to IT business value research. Therefore, a cross-disciplinary study of the relationship between IT and organisational factors is deemed valuable and appropriate (Orlikowski & Barley 2001), which builds on previous work in change management and IT business value.

2 A CHANGE MANAGEMENT PERSPECTIVE

Informed by systems perspectives, Flood (1995) and Cao et al. (2004) suggest that an organisation has four main dimensions, namely organisational processes, structures, cultures and politics, which are considered critical to the success of change management in any organisation.

Organisational processes are designed to support business operations by transforming certain inputs into outputs of value to customers. They may consist of activities or procedures that are related to transforming raw materials to finished products, investments to profits, and raw data to information and knowledge. They can be intra- or inter-organisational, ranging from operational sub-process, intra-process, inter-process relationship, process redesign, to total process re-conception (Peters 1994). Organisational structures are created to enable an organisation to meet its stated objectives, referring to the degree and type of horizontal and vertical differentiation, mechanisms of coordination and control, formalisation, and centralisation of power. In developed industrial societies, organisational forms are seen to change to a more flat authority structure with multiple horizontal linkages between the inner core of a company and its outside suppliers, contractors and customers (Reed 1992). The third dimension is organisational culture, referring to traditions, values, beliefs and human behaviour in terms of relationships to social rules and practices. Organisational culture has always been considered an important factor in management (Morgan 1997), shaping business practices in widely

varying ways. The forth dimension is organisational politics, referring to how power is distributed and used to influence decision making in organisations. Mintzberg (1998) distinguishes four different types of power: authority, based on "legally" approved power; ideology, based on accepted beliefs; expertise, based on power being "officially certified"; and politics, which he suggests is neither legally approved, widely accepted or formally certified, but rather is usually divisive, conflicting, and mitigates against the more legitimate systems of influence. Whenever interests conflict, power is likely to be the means of either resisting change or mobilising support (Cendon & Jarvenpaab 2001).

Most significantly, these four dimensions are seen to be dynamically interrelated and interacting, change in any one dimension frequently results in change in other dimensions (Cao & McHugh 2005). In line with this, DeLisi (1990) asserts that "shifts in the large culture influence individuals, who influence organisational culture, which in turn affects organisational structure"; whilst Reed (1992) affirms that organisational culture is shaped by organisational politics and will direct long-term structural development. Rodrigues (2006) based on a longitudinal case study also corroborates that cultural change such as integration or differentiation is a political process depending on "the legitimacy of internal coalitions and their capacity to sustain integrative ideals". In addition, there are a number of empirical studies that support the view of organisational changes being mutually dependent. Stebbins et al. (1998) for instance find that drastic process-focused changes in a firm practically lead to multiple changes in other organisational dimensions in tandem. They conclude that these process changes are more likely to be successful when they are integrated with other organisational changes such as cultural and structural change. Koch (2001), based on a total of 30 case studies from Danish and German manufacturing industries, also confirms that ERP implementation "as a political program for change" can reshape "the overall business structure, the business processes and the micro level elements".

Additionally, the four dimensions can either reinforce or work against each other. Organisational politics can be used to either facilitate or resist organisational change (White & Jacques 1995) such as transforming a traditional bureaucracy structure to "groovy community centers" (Ogbonna & Harris 2003), embracing a cohesive organizational culture where "contest over meaning is central" or a "working culture" when pluralism and ambiguity are desirable in mergers and acquisitions (Riad 2007). Organisational structures once created based on a certain set of values and beliefs may in turn be used to either enable or constrain other business activities (Giddens 1984, 1987). Ifinedo (2007) indicates that the success of ERP depends on an organisational structure characterised by well-established formalisation, specialisation and a command and control structure.

Therefore the change management literature has shown that when organisational changes interact to strengthen each other, change management is more effective and organisational performance is more likely to be significantly improved; when they counteract each other, change management is unlikely to be successful and organisational performance is more likely to be worse. Nonetheless, firm performance, which is often measured in monetary or quantitative indictors, is hardly a depoliticised process (Ogbonna & Harris 2003).

Applying this change management perspective to the domain of IT business value draws attention to the following key implications for understanding the impacts of IT on firm performance. First, since an organisation's dimensions are interdependent, IT adoption and its business value cannot be justifiably isolated from this multidimensional organisational context; rather they should be seen to be dynamically interwoven with other organisational dimensions and their interaction. Whenever IT is adopted, it is likely to trigger significant changes in other organisational dimensions, which in turn may affect IT business value either positively or negatively. Second, because of this interrelatedness, it is argued that any model of IT business value should have the scope that enables one to understand how IT business value is created through, and affected by, this interdependence in a holistic way. If a model focuses on IT resources only, or on IT and some specific organisational factors, the understandings of IT business value developed from the model are incomplete at best. Therefore the change management perspective is seen to be of value in provide insights into further conceptualising

organisational factor and their roles in creating IT business value, which is discussed in detail subsequently.

3 THE CATEGORIES OF ORGANISATIONAL FACTORS AND THEIR RELATIONSHIP WITH IT

Since IT adoption in a firm can be seen as a change that is likely to transform other organisational factors that in turn may affect the success of the IT adoption itself and eventually IT business value, the four-dimensional view of organisational change can be conveniently adopted to classify important organisational factors in the IT business value research into organisational processes, structures, cultures and politics. If such a classification is to be of value, it should be possible to map the organisational factors identified in the IT business value studies into meaningful categories, helping to discuss the relationship between IT and organisational factors. Subsequently, a summary of the mapping is presented to organise current understandings of how IT business value might be affected by each of the four organisational factors.

First, IT has long been identified by many IT business value studies as indispensable in transforming business processes, which in turn may affect IT business value (Brynjolfsson & Hitt 2000, Markus 2004). For example, Brynjolfsson and Hitt (2000) identify that IT business value depends on complementary business processes when an organisation implements a new electronic purchasing system. They indicate that the whole purchasing process may have to change while new activities or procedures such as electronic supplier search on public or private e-markets are introduced at the same time. The new information systems and process changes have to go jointly to make IT as valuable as possible for the implementing organisation. However, in reality the management of IT-enabled change may often face an issue of IT and process misfit (Markus 2004, Wu et al. 2007). For example, ERP systems designed for continuous production processes do not work well when applied in discrete part manufacturing factories. When IT and organisational processes are conflicting, any possible IT benefits are "more than outweighed by negative interactions with existing organisational practices" (Brynjolfsson & Hitt 2000). In addition, from a measurement perspective, a number of researchers have developed a process-oriented model of IT business value (Davamanirajan et al. 2006). They argue that the immediate effects of IT are manifested in process improvements that in turn affect the overall organisational performance; therefore IT business value can be more properly measured at both the process and organisational levels. In short, on the one hand "IT has been the catalyst for a broader host of changes" (Brynjolfsson 2003); on the other hand organisational processes in turn may either add to or reduce IT business value. One main theme emerged from previous studies is when IT and organisational processes support each other, superior IT business value can be expected; whenever there is an issue of IT and process misfit, the full potential of IT cannot be realised.

Second, a great number of studies suggest that IT business value can be under the sway of organisational structures (Brynjolfsson 2003, Hitt & Brynjolfsson 1997, Ifinedo 2007, Powell & Dent-Micallef 1997). However, not all studies agree what the relationship between IT and organisational structure should be. For example, Hitt and Brynjolfsson (1997) find that increased investments in IT is linked to decentralization of decision authority and related practices. Brynjolfsson (2003) confirms that IT business value is consistently correlated to, among other factors, organisational structures such as decentralised and distributed decision making. Similarly, Brynjolfsson et al. (2002) conclude that when IT resources are implemented together with structural decentralization, individual decentralization and team incentives, the combination "creates more value than the simple sum of their separate contributions". In contrast, Lee and Grover's (2000) indicate that communications technologies are not associated with either the centralization or decentralisation level of an organization in manufacturing firms. Meanwhile, other studies have examined varied IT and structural issues. Powell and Dent-Micallef (1997) recognize that organisational structure in terms of open organisation and team-based structure has a performance enhancing effect on IT in the retail industry. Based on the concept of strategic alignment between IT, strategy, and structure, Bergeron et al. (2004)

find that low-performance firms show evidence of a conflictual co-alignment pattern that distinguishes them from other firms. Leifer (1998) on the other hand argues that successful implementation of information systems depends on whether information systems are matched with appropriate organisational structures. He suggests that the natural fits include simple structures and standalone systems, machine bureaucracy and centralized online systems, professional bureaucracy and centralized and distributed systems, divisional structures and decentralized systems, and adhocracy and decentralized systems. Although studies seem to have different findings under different problem situations, a consensus identified is that greater IT business value can be expected in a firm when IT and organisational structure align with each other; when they conflict with each other, firm performance is more likely to be adversely affected.

Third, numerous IT business value studies have seen organisational culture as an important factor that may explain significant variations in IT business value (Brynjolfsson 2003, Ifinedo 2007, Leidner & Kayworth 2006, Robey & Boudreau 1999, Warren & Myungsin 2007). For example, while Ifinedo (2007) reveals a positive relationship between ERP success and a supportive, cooperative and collaborative organisational culture; Weber and Pliskin (1996) find that during bank mergers and acquisitions high culture differences between the joining companies are negatively associated with the effectiveness of IT integration. Bradley et al. (2006) corroborate that organisational culture is an important factor in studying IT success and explaining variations in IT success. Through an empirical study of the impact of IT plan quality on IT success, they indicate that IT plan quality has a greater impact on IT success in conjunction with an entrepreneurial culture characterised by spontaneity, flexibility and individuality than with a formal culture emphasising control, stability, order and bureaucracy. In addition to empirical evidences, Robey and Boudreau (1999) has concentrated on theories of organizational culture as a means to explain the contradictory IT consequences within firms. Lately, Leidner and Kayworth (2006) conduct a detailed review of culture's impact on IT, IT's impact on culture, and IT culture at national, organisational and group levels with the purpose of developing a theory of IT-culture conflict to explain the reciprocal link between IT and culture. Briefly, based on previous IT studies, the inference is that in a firm superior IT business value is more likely to be realised when IT is reinforced by the organisational culture than it is not.

Fourth and finally, there are relatively fewer studies discussing organisational politics in IT business value research, probably as a consequence of the negative connotation of politics (Silva 2007). Nevertheless, organisational politics play a critical role in affecting how IT impacts on firm performance (Clemons et al. 1995, Jasperson 2002, Robey & Boudreau 1999, Tantoush & Clegg 2001) and therefore should not be ignored. While IT may be used politically to trigger other organisational changes, the exercise of power is an important organisational phenomenon that affects the understanding, development and management of IT (Koch 2001, Jasperson et al. 2002) or the evaluation of IT implementation (Gwillim et al. 2005). For example, Robey and Boudreau (1999) point to the significance of disciplinary power in studying IT in numerous organizations. Tantoush and Clegg (2001) argue that successful IT applications such as CAD/CAM depend on organisational politics rather than technological or economic factors: firms fail "because they cannot manage the politics of the technology in its impact upon organization design". Clemons et al. (1995) also support this politicised view regarding implementing IT to reengineer business processes. Similarly, top management commitment has been identified as one major factor to enhance the IT impact on firm performance. Without such support, it is argued that even large IT investments will have little or no effect on a firm's competitive position or performance (Powell & Dent-Micallef 1997, Wade & Hulland 2004). Alternatively, if top managers in a firm exercise power ineffectively, negative political behaviour may appear and cause confusion, wasted effort and a significant lack of productivity (Levine & Rossmoore, 1994, Jasperson et al. 2002). However, it has to be noted that many studies have never used the term power or politics explicitly to refer to top management commitment. This paper classifies top management commitment as a political factor because it is a case of officially using "legally" approved power (Mintzberg 1988) to influence IT adoption in organisations. The concept of various organisational power and the relationship between IT and organisational politics have been comprehensively summarised by Jasperson et al. (2002). Based on a literature review they

understand the link between IT and organizational power by using two sets of lenses: the first consisting of the technological imperative, organizational imperative and emergent perspectives and the second including the rational, pluralist, interpretive, and radical perspectives. To sum up, the understandings of the reciprocal association between IT and organisational politics developed in previous studies suggest that greater IT business value can be expected in a firm whenever IT adoption and organisational politics support each other than they work counteractively.

So far the mapping has shown a good match between the organisational factors identified in previous IT business value studies and the four organisational dimensions. Although it may not be possible that all organisational factors such as organisational size could be meaningfully organised into the four categories and that this mapping is exhaustive or inclusive, it can be argued that the classification offers a useful structure to help to specify the most important organisational factors in affecting IT business value. Meanwhile the mapping helps to summarise and discuss the relationship between IT and organisational factors. All these have provided the basis for further discussing and conceptualising the interrelationships between organisational factors and IT business value.

4 THE ROLES OF ORGANISATIONAL FACTORS IN CREATING IT BUSINESS VALUE

In the previous section, the link between IT and each of the organisational factors has been discussed through mapping previous IT business value studies into the four categories. This suggests that there are situations where IT and organisational factors interact with each other and therefore impact on IT business value or organisational performance. The main inference from this is that higher organisational performance is more likely when IT align with each organisational factor in an organisation; when they misalign, there is a greater chance that the performance is negatively affected. The mapping also reaffirms the point made by Weill and Olson (1989) that the majority of the studies have focused on a relationship between IT and one specific organisational factor in isolation and the contingent relationship is often implicitly assumed rather than clearly defined. From the perspective of organisational change management, however, organisational factors are not isolated but interrelated. The success of IT adoption depends on effectively managing the interaction between IT and organisational factors holistically rather than in isolation. Therefore, building on previous research and the understandings developed so far in this paper, the roles of organisational factors in creating IT business value can be explained by the following propositions:

Proposition 1: *In organisations where IT and organisational factors reinforce each other, superior or more-than-average IT business value will be realised.*

Proposition 2: *In organisations where there is counteraction between IT and organisational factors, negative or less-than-average IT business value can be expected.*

These two propositions are seen to be consistent with the RBV. It can be argued that when IT is embedded within a firm's unique business processes and structure and is reinforced by the firm's unique culture and politics, IT and organisational factors together will form IT capabilities (Grant 2005) that are simultaneously valuable, rare, inimitable and non-substitutable and thereby become a source of sustainable competitive advantage. When IT and organisational factors reinforce each other to the utmost extent, superior IT business value can be expected. For example, Wal-Mart has sustained its competitive advantage over other retailers as a result of combining effective use of IT and successfully managing IT-enabled changes (Brynjolfsson 2003). The same can be said about many leading companies in other industries. In organisations where IT and organisational factors reinforce each other to a certain extent, more-than-average IT business value can be anticipated. On the contrary, when there is counteraction between IT and organisational factors in any organisation, poor organisational performance is more than likely. In organisations where IT and organisational factors work against each other to a very great extent, IT adoption may fail and negative business value might be inescapable. For example, in an American telecommunications company political factor is

determined to be the cause of a business process change failure (Sarker et al. 2006), while in a Korea company where the corporate culture clashes with an IT implementation to such an extent that the IT adoption is failed, even though top management has fully approved, supported and mandated the IT adoption (Warren & Myungsin 2007). In organisations where IT and organisational factors counteract each other to some extent, less-than-average IT business value is a probable result. Alternatively, in organisations where both reinforcement and counteraction coexist, average IT business value may be anticipated. The relationship between the RBV and the two propositions developed in this paper is summarised in Figure 1.

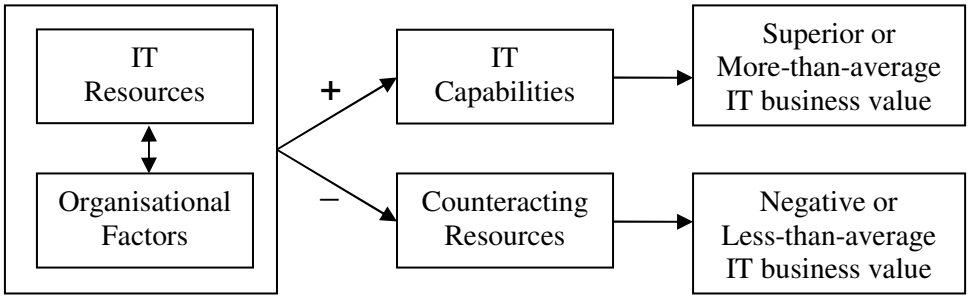

Figure 1. The Roles of Organisational Factors in Creating IT Business Value

Furthermore, the two propositions are seen to be in agreement with Black and Boal's (1994) study of strategic resources. They suggest that resources can have one of three possible effects on one another: compensatory, enhancing, or suppressing/destroying. A compensatory relationship exists when a change in the level of one resource is offset by a change in the level of another resource. This would be comparable to a case of IT and organisational factors reinforcing each other to a certain extent described in Proposition 1. An enhancing relationship exists when one resource magnifies the impact of another resource. For example, the effective use of IT is amplified by reinforcing organizational factors. This enhancing relationship would correspond to situation where IT and organisational factors reinforce each other to a great extent or to the utmost extent. A suppressing relationship exists when the presence of one resource diminishes the impact of another, which would approximate to Proposition 2 where there is counteraction between IT and organisational factors.

Finally, the two propositions can be seen to complement the traditional contingency perspectives by addressing some of the main issues raised by Weill and Olson (1989). First, focusing on the interactions between IT and the four organisational dimensions helps to appreciate the complexity of IT business value creation more holistically, comparing with looking at only one aspect of IT business value creation in isolation in a traditional contingency analysis. Second, a clear incorporation of cultural and political factors into the contingency model enables "much of the richness and complexity" of the interrelationships to be considered and therefore a "more subjectivist, less functional and less deterministic approach" to be possible. Further, this analysis suggests that it is possible to combine a contingency model with the RBV and a change management viewpoint, therefore encouraging researchers to clearly define the interrelationships between IT and organisational factors with a broader perspective.

5 CONCLUSION

This paper makes several contributions. First it provides a classification of organisational factors to help coherently specify and compare various organisational factors for the purpose of knowledge accumulation. This is the first study to systematically classify and map organisational factors identified in the IT business value literature into organisational processes, structure, culture and

politics. The mapping has shown that this classification can be a meaningful way to organise diverse organisational factors and to summarise the understandings developed so far in the research domain.

The second contribution of this paper is that it goes beyond understanding IT business value with respect to some specific organisational factors. Few previous studies in the literature have examined how IT business value might be affected by two or more organisational factors. This is the first study to holistically focus on how IT business value might be affected through the interaction of different types of organisational factors. This paper understand IT adoption as a change that is likely to trigger significant change in a firm's processes, structure, culture and politics, which in turn may affect IT either positively or negatively. Since IT and organisational factors are interacting, IT cannot be justifiably isolated from the multidimensional organisational context, and a holistic approach is deemed most pertinent to understanding IT business value by centring on the interaction between IT and organisational factors.

Another contribution of this paper comes from providing an explanation of how IT and organisational factors might work together to create business value. It highlights that when they interact to reinforce each other they become IT capabilities that lead to superior or more-than-average IT business value; when there is counteraction between them, they are just counteracting resources that bring about either negative or less-than-average IT business value. This can be seen to be a contingency approach without being narrowly focused, functional and deterministic (Weill and Olson 1989).

A fourth contribution of this paper is that it points to the value of a cross-discipline study building on the work in IT business value and organisational change management (Orlikowski & Barley 2001), which has generally been overlooked in the IT literature (Sherer et al. 2003). Understanding IT adoption being closely interwoven with and affected by organisational factors, a cross-disciplinary research is more pertinent in understanding the dynamic and reciprocal relationship between IT and organisational factors and the final impact on firm performance.

Although this paper highlights the importance of focusing on the interaction of IT and organisational factors, further research is required to empirically examine whether the variances in IT business value can be explained by this view. In addition, more research is also needed to investigate the impact of IT on organisational factors and organisational factors on IT. For example, although organisational politics plays a very important role in managing IT-enabled change, currently this is still a peripheral topic in the IT literature (Jasperson et al. 2002). From a managerial perspective, this paper argues that future IT adoption must begin with considering and effectively managing the interaction between IT and organisational factors. Only then a firm can hope to realistically realise superior IT business value.

References

Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99-120.

Becerra-Fernandez, I. and Sabherwal, R. (2001). Organizational knowledge management: A contingency perspective. Journal of Management Information Systems, 18(1), 23-55.

Bergeron, F., Raymond, L., and Rivard, S. (2004). Ideal patterns of strategic alignment and business performance. Information & Management, 41(8), 1003-1020.

Brown, C and Magill, S (1994). Alignment of the IS functions with the enterprise: Toward a model of antecedents. MIS Quarterly, 18(4), 371-403.

Bhatt, G. and Grover, V. (2005). Types of information technology capabilities and their role in competitive advantage: An empirical study. Journal of Management Information Systems, 22(2), 253-277.

Black, J. and Boal, K. (1994). Strategic resources: Traits, configurations and paths to sustainable competitive advantage. Strategic Management Journal, 15(special issue), 131-148.

Bradley, R., Pridmore, J. and Byrd, T. (2006). Information Systems Success in the Context of Different Corporate Cultural Types: An Empirical Investigation. Journal of Management Information Systems, 23(2), 267-294.

Brynjolfsson, E. (2003). The IT productivity gap. Optimize, 26-43.
Brynjolfsson, E. and Hitt, L. (1996). Paradox lost? Firm-level evidence on the returns to information systems spending. Management Science, 42(4), 541-558.
Brynjolfsson, E. and Hitt, L. (2000). Beyond computation: Information technology, organisational transformation and business performance. Journal of Economic Perspectives, 14(4), 23-48.
Brynjolfsson, E., Hitt, L., Yang, S., Baily, M. and Hall, R. (2002). Intangible assets: Computers and organizational capital / Comments and discussion. Brookings Papers on Economic Activity, (1), 137-198.
Cao, G., Clarke, S. and Lehaney, B. (2004). The need for a systemic approach to change management—a case study. Systemic Practice and Action Research, 17(2), 103-126.
Cao, G. and McHugh, M. (2005). A Systemic View of Change Management and Its Conceptual Underpinnings. Systemic Practice and Action Research, 18(5), 475-490.
Cendon, B. and Jarvenpaab, S. (2001). The development and exercise of power by leaders of support units in implementing information technology-based services. The Journal of Strategic Information Systems, 10(2), 121-158.
Clemons, E., Thatcher, M. and Row, M. (1995). Identifying sources of reengineering failures: A study of the behavioral factors contributing to reengineering risks. Journal of Management Information Systems, 12(2), 9-26.
Davamanirajan, P., Kauffman, R., Kriebel, C. and Mukhopadhyay, T. (2006). Systems Design, Process Performance, and Economic Outcomes in International Banking. Journal of Management Information Systems, 23(2), 65-90.
Davenport, T. (1998). Putting the enterprise into the enterprise system. Harvard Business Review, 76(4), 121-131.
DeLisi, P. (1990). Lessons from the steel axe: Culture, technology, and organisational change. Sloan Management Review, 32(1), 83–93.
Fiedler, F. (1964). A Contingency Model of Leadership Effectiveness, in Berkowitz, L. (ed.), Advances Experimental Social Psychology, 1, 149-190. New York: Academic Press.
Flood, R. (1995). Solving Problem Solving. Wiley, UK.
Giddens, A. (1984). The Constitution of Society. University of California Press, California.
Giddens, A. (1987). Social Theory and Modern Society. Polity Press, Cambridge.
Grant, R. (2005). Contemporary strategy analysis. 5th ed. Blackwell Publishing: Malden, USA.
Gregor, S., Martin, M., Fernandez, W., Stern, S. and Vitale, M. (2006). The transformational dimension in the realization of business value from information technology. Journal of Strategic Information Systems, 15(3), 249–270.
Gwillim, D., Dovey, K. and Wieder, B. (2005). The politics of post-implementation reviews. Information Systems Journal, 15(4), 307-319.
Henderson, J. and Venkatraman, N. (1999). Strategic alignment: Leveraging information technology for transforming organization. IBM Systems Journal, 32(2/3), 472-484.
Hitt, L. and Brynjolfsson, E. (1996). Productivity, business profitability, and consumer surplus: Three different measures of information technology value. MIS Quarterly, 20(2), 121-142.
Hitt, L. and Brynjolfsson, E. (1997). Information technology and internal firm organization: An exploratory analysis. Journal of Management Information Systems, 14(2), 81-101.
Ifinedo, P. (2007). Interactions between organizational size, culture, and structure and some it factors in the context of ERP success assessment: an exploratory investigation. The Journal of Computer Information Systems, 47(4), 28-44.
Jarvenpaa, S. and Leidner, D. (1998). An information company in Mexico: extending the resource-based view of the firm to a developing country context. Information Systems Research, 9(4), 342-361.
Jasperson, J., Carte, T., Saunders, C., Butler, B., Croes, H. and Zheng, W. (2002). Review: Power and information technology research: A metatriangulation review. MIS Quarterly, 26(4), 397-459.
Kast, F., Rosenzweig, J. (1973). Contingency Views of Organization and Management. Chicago: Science Research Associates.

Kettinger, W., Grover, V., Guha, S. and Segars, A. (1994). Strategic information systems revisited: a study in sustainability and performance. MIS Quarterly, 18(1), 31-58.
Khazanchi, D. (2005). Information technology (IT) appropriateness: the contingency theory of "fit" and it implementation in small and medium enterprises1. The Journal of Computer Information Systems, 45(3), 88-95.
Koch, K. (2001). Enterprise resource planning Information technology as a steamroller for management politics? Journal of Organizational Change Management, 14(1), 64-78.
Kohli, R. and Devaraj, S. (2003). Measuring information technology payoff: A meta-analysis of structural variables in firm-level empirical research. Information Systems Research, 14(2), 127-145.
Lee, C. and Grover, V. (2000). Exploring mediation between environmental and structural attributes: The penetration of communication technologies in manufacturing organizations. Journal of Management Information Systems, 16(3), 187-217.
Leidner, D. and Kayworth, T. (2006). Review: A Review of Culture in Information Systems Research: Toward a Theory of Information Technology Culture Conflict. MIS Quarterly, 30(2), 357-399.
Leifer, R. (1988). Matching Computer-Based Information Systems with Organizational Structures. MIS Quarterly, 12(1), 63-73.
Levine, H. and Rossmoore, D. (1994). Politics and the function of power in a case study of IT implementation. Journal of Management Information Systems, 11(3), 115-133.
Markus, M. (2004). Technochange management: using IT to drive organisational change. Journal of Information Technology, 19(1), 4-20.
Macredie, R. and Sandom, C. (1999). IT-enabled change: Evaluating an improvisational perspective. European Journal of Information Systems, 8(4), 247-259.
Melville, N., Kraemer, K. and Gurbaxani, V. (2004). Review: Information technology and organisational performance: An integrative model of IT business value. MIS Quarterly, 28(2), 283-322.
Mintzberg, H. (1998). The structuring of organisations, in Mintzberg, H., Quinn J., Ghoshal, S. The Strategy Process, Revised European Edition. Prentice-Hall, London, pp. 332-52.
Morgan, G. (1997). *Images of Organisation*. Sage, London.
Nault, B. (1998). Information technology and organization design: Locating decisions and information. Management Science, 44(10), 1321-1335.
Ogbonna, E. and Harris, L. (2003). Innovative organizational structures and performance: A case study of structural transformation to "groovy community centers". Journal of Organizational Change Management, 16(5), 512-34.
Orlikowski, W. and Barley, S. (2001). Technology and institutions: What can research on information technology and research on organizations learn from each other? MIS Quarterly, 25(2), 145-165.
Panagiotis, K., Lycett, M. and Paul, R. (1999). Evaluating business information systems fit: From concept to practical application. European Journal of Information Systems, 8(1), 65-76.
Peters, J. (1994). Operationalizing total quality: A business process approach. TQM Magazine, 6(4), 29–33.
Powell, T. and Dent-Micallef, A. (1997). Information technology as competitive advantage: The role of human, business, and technology resources. Strategic Management Journal, 18(5), 375-405.
Ray, G., Muhanna, W. and Barney, J. (2005). Information technology and the performance of the customer service process: A resource-based analysis. MIS Quarterly, 29(4), 625-652.
Raymond, L. (1990). Organizational Context and Information Systems Success: A Contingency Approach. Journal of Management Information Systems, 6(4), 5-20.
Reed, M. (1992). Introduction. In: Rethinking Organization: New Directions in Organisation Theory and Analysis, Reed, M. and Hughes, M. (eds.), pp. 1–15. Sage, London.
Riad, S. (2007). Of mergers and cultures: "What happened to shared values and joint assumptions?" Journal of Organizational Change Management, 20(1), 26-43.
Robey, D. and Boudreau, M. (1999). Accounting for the contradictory organizational consequences of information technology: Theoretical directions and methodological implications. Information Systems Research, 10(2), 167-185.

Rodrigues, S. (2006). The Political Dynamics of Organizational Culture in an Institutionalized Environment. Organization Studies, 27(4), 537-557.
Santhanam, R. and Hartono, E. (2003). Issues in linking information technology capability to firm performance. MIS Quarterly, 27(1), 125-153.
Sarker, S., Sarker, S. and Sidorova, A. (2006). Understanding Business Process Change Failure: An Actor-Network Perspective. Journal of Management Information Systems, 23(1), 51-86.
Scott, J. and Vessey, I. (2002), Managing risks in enterprise systems implementations. Communication of the ACM, 45(4), 74-81.
Sherer, S., Kohli, R. and Baron, A. (2003). Complementary Investment in Change Management and IT Investment Payoff. Information Systems Frontiers: Special Issue: IT Investment Payoff in E-Business, 5(3), 321-333.
Siegal, W., Church, A., Javitch, M., Waclawski, J., Burd, S., Bazigos, M., Yang, T., Anderson-Rudolph, K. and Burke, W. (1996). Understanding the management of change: An overview of managers' perspectives and assumptions in the 1990s. Journal of Organizational Change Management, 9(6), 54–80.
Silva, L. (2007). Epistemological and theoretical challenges for studying power and politics in information systems. Information Systems Journal, 17(2), 165-183.
Stebbins, M., Shani, A., Moon, W. and Bowles, D. (1998). Business process reengineering at Blue Shield of California: The integration of multiple change initiatives. *Journal of Organizational Change Management,* **11(3),** 216–232.
Strassman, P. (1997). The Squandered Computer. The Information Economics Press, USA.
Tantoush, T. and Clegg, S. (2001). CADCAM integration and the practical politics of technological change. Journal of Organizational Change Management, 14(1), 9-27.
Teo, T. and Pian, Y. (2003). A contingency perspective on Internet adoption and competitive advantage. European Journal of Information Systems, 12(2), 78-92.
Thatcher, M. and Pingry, D. (2007). Modeling the IT Value Paradox. Communications of the ACM, 50(8), 41-45.
Tillquist, J. (2000). Institutional bridging: How conceptions of IT-enabled change shape the planning process. Journal of Management Information Systems, 17(2), 115-152.
Umanath, N. (2003). The concept of contingency beyond "It depends": illustrations from IS research stream. Information & Management, 40(6), 551-562.
Wade, M. and Hulland, J. (2004). Review: The resource-based view and information system research: Review, extension, and suggestion for future research. MIS Quarterly, 28(1), 107-142.
Warren, J. and Myungsin, C. (2007). Culture, Organizational Dynamics and Workflow Implementation: The Case of a Failed Implementation. Journal of Information Technology Case and Application Research, 9(1), 20-38.
Weber, Y. and Pliskin, N. (1996). The effects of information systems integration and organizational culture on a firm's effectiveness. Information & Management, 30(2), 81-90.
Weill, P. and Olson M. (1989). An assessment of the contingency theory of management information systems. Journal of Management Information Systems, 6(1), 59-85.
White, R. and Jacques, R. (1995). Operationalizing the postmodernity construct for efficient organisational change management. Journal of Organizational Change Management, 8(2), 45–71.
Wu, J., Shin, S. and Heng, M. (2007). A methodology for ERP misfit analysis. Information & Management, 44(8), 666-680.