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# A Causal Model of Strategic Alignment and Firm Performance

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# A CAUSAL MODEL OF STRATEGIC ALIGNMENT AND FIRM PERFORMANCE

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## Abstract

*Earlier studies in 1980s found no causal links between IT investments and productivity, since then a growing body of research has been investigating such links at a much finer-level of analysis. Yet the results have been inconclusive. We attribute the mixed findings to an incomplete causal chain analysis, specifically the exclusion of key constructs such as strategic alignment which would allow a better understanding of how organizations can leverage IT to positively influence firm performance. In this paper, we propose a framework that conceptualizes strategic alignment as the directional linkages between business and IT strategy, and examine how previously identified antecedent variables affect the linkages. And to complete the model, we also integrate two intermediate variables that link strategic alignment with firm performance. The framework provides insights into guiding further empirical research. For practitioners, they can use the present framework to walk through their investment decisions and understand the required resources and conditions to realize the potential values of their IT investments.*

*Keywords: Strategic Alignment, KM Capability, IT-Business Value, Firm Performance*

## 1 INTRODUCTION

One of the most widely cited quote, Robert Solow (July 12, 1987) once asserts that “we see computers age everywhere except in the productivity statistics”. This phenomenon is commonly known as the 'Productivity Paradox' which states that IT investments do not affect on productivity growth. Indeed, earlier studies in 1980s found no significant, direct relationship between IT investment and productivity at the level of firms, industries, and the economy (Strassmann 1990). However, later research has generated mixed and inconclusive findings. Against this, economists, MIS researchers and management scientists have encouraged more research at a finer-level of analysis of the causal links between IT and productivity (Brynjolfsson 1993).

In the field of IS, the focus is on the identification of the missing links as part of the causal chain between IT and firm performance (Chan et al. 2006, Kearns and Ledere 2001; Sabherwal and Chan 2001). Hu and Huang (2005) argue that the way in which business strategy aligns with IT strategy in the real world still remains unanswered. Mahmood (1993, p. 185) states that “strategic managers clearly need a better understanding of the impact of IT investment on organizational strategic and economic performance”. This view is reiterated by many IS researchers that IT-business alignment can help organizations improve the positive impact of IT on their performance (Henderson and Venkatraman 1993; Reich and Benbasat 1996; Croteau et al. 2001). Despite a growing body of research (e.g. Brown and Magill 1994; Reich and Benbasat 1996), recent review (e.g. Kearns and Lederer 2001; Chan et al. 2006) has continuously called for more research to examining the factors that affect IT-business alignment; and the coupling processes from alignment to enhanced business performance.

Against this, our aim is to provide a succinct and holistic review of the extant literature in strategic alignment; and notably to examine the antecedents of strategic alignment and the causal linkages between strategic alignment and firm performance. The rest of this paper is organized as follows. We will introduce the theoretical background of our research motivation and questions. Then, we propose a framework starting with our conceptualization of alignment as the directional linkages between business and IS strategy; the antecedents of alignment; and followed by the intermediate variables between alignment and firm performance.

## **2 Theoretical background**

Numerous articles have been written about how IT affects organizational performance (e.g. Brynjolfsson, 1993; Dedrick et al., 2003). A major concern is how to assess the IT-related business value and organizational impacts. Broadly, there are two main approaches. The first approach examines the direct and multiple linkages between IT investment and organizational performance across economy, industry and firm. The second approach examines the indirect linkages between IT investment and organizational performance through identifying important intermediaries. These two approaches often lend themselves to contradicting results. Some research shows no significant correlation (e.g. Brynjolfsson 1993) whereas others indicate a positive relationship between IT investment and firm performance (Rai et al. 1997). The challenge is not only to identify the crucial factors that affect firm performance but also to build a credible causal chain between IT and firm performance (Im et al. 2001). Most of the MIS research has started with IT-business alignment as an important missing link between IT and organizational performance (Henderson and Venkatraman 1993; Sabherwal and Chan 2001).

### **IT - Business Alignment**

Alignment of IT or IS strategy with business strategy has been ranked as one of the most important issues facing business and IT executives (Luftman 1996). The alignment between IT and business can be defined as the fit of IT strategies and plans to business strategies and goals (King 1978). Alignment has been defined as the extent to which the IT mission, objectives and plans support and are supported by their business counterparts (Luftman et al. 1993). Further, IT-business alignment concerns the degree of correspondence of an organization's IT strategy and IT infrastructure with the organization's strategic business objectives and infrastructure. Since the late 1980s, alignment has been an important concern to the business community (Watson et al. 1997) as it not only helps firms realize the potential benefits from investments in IT (Tallon et al. 2000) but also enhances business performance through aligning the organizational and technological infrastructures (Croteau et al. 2001).

The majority of research in both IS and management literature deploys the strategic alignment model of Henderson and Venkatraman (1993). The model suggests that IT-business alignment can be achieved in organizations by building linkages among 4 strategic domains: business strategy, IT strategy, organizational infrastructure and processes, and IT infrastructure and processes. Ho (1996) argued that strategic alignment types can be classified as either bivariate fit or cross-domain alignment. While the former links two domains horizontally or vertically, the latter type could be seen as a multi-domain relationship that engages two or three strategic domains. Furthermore, some researchers (Markus and Robey 1983, Miller 1993, Croteau et al. 2001) regard fit as mutual adjustment between business strategy or structure, and IT strategy or structure. Despite various types of alignment, our main focus here is on strategic alignment considering its importance to firm performance (e.g. Reich and Benbasat 2000; Chan 2002).

We conceptualize alignment as the levels of fit related to the directional linkages between business and IT strategy. The directional linkages comprise three specific types: unilateral business strategy (BS) fit concerns fitting the BS to the IT constraints; unilateral information

system strategy (ITS) fit concerns formulating the ITS to fit/meet the business requirements; and bilateral fit concerns the establishment of a reciprocal relationship between BS and ITS. Although earlier research has suggested bilateral fit through mutual adjustment (e.g. Henderson and Venkatraman 1993, Markus and Robey 1983), most research seems to examine how ITS can be adjusted towards the success of alignment (e.g. Sabherwal et al. 2001). Thus far, there is little research on the impact of unilateral fits on firm performance, specifically the conditions that favour one unilateral fit to another, and notably the ordering of the two types of unilateral fit to the emergence of bilateral fit. We hope the above conceptualization of alignment will provide better insights into the conditions of alignment in terms of the antecedent variables, and the consequences of alignment in terms of the intermediate processes in leveraging the organizational capabilities and further realizing the potential business values in IT. Figure 1 displays our research framework.

### **1. Communication between business and IT executives.**

Research on strategic alignment underlines the importance of relationship management. In general, the relationships between business and IT strategy can be viewed as social and intellectual linkages. The intellectual linkage concerns the content of plans and planning tactics whereas the social linkage concerns the actors of the alignment process. Reich and Benbasat (1996, p. 58) defined the social linkage as “the state in which IT and business executives within an organizational unit understand and are committed to the business and IT mission, objectives, and plans”. Reich and Benbasat (2000) used Galbraith (1977) typology of six techniques to measure the ways in which IT and business executives communicate with each other. They include direct communication through regular or ad hoc meetings, electronic mail or written memos; a named person serving as a liaison officer; temporary task forces such as IT project team; permanent teams such as IT steering committee; promoting IT personnel to lead a business quality unit; and managerial linking roles. They found the level of formal communication between business and IT executives exerted a positive influence on short-term alignment. Further, Clark and Fujimoto (1987) suggested that successful linkage depends on direct liaisons and personal linkages across business and IT functional units. Broadbent and Weill (1993) also draw a similar conclusion that the linkages between IT personnel and business units predicted the success of a bank. Luftman and Brier (1999) found in their study that the relationship between IT and a non-IT person significantly contributed to alignment. Besides formal structures, Chan (2002) argued that informal structures can be far more important than formal structures, and affect the prospects of long-term alignment. Cohen and Levinthal (1990) argued that both intellectual and social linkages are vital in enhancing the absorptive capacity of a firm to recognize and assimilate the value of new information, and notably to enable appropriation. However, unilateral fit can be damaging, specifically, in the case of IT project escalation, the so-called mum effect when IT executives fail to communicate the problems to business executives (Keil and Robey 2001). In sum, bilateral communication between business and IT executives through formal and informal channels will greatly enhance both the prospects of short and long term alignment. This has led to our first set of propositions:

Proposition 1a. *Bilateral fit in communication is positively related to alignment.*

Proposition 1b. *Unilateral BS and ITS fits in communication are negatively related to alignment.*

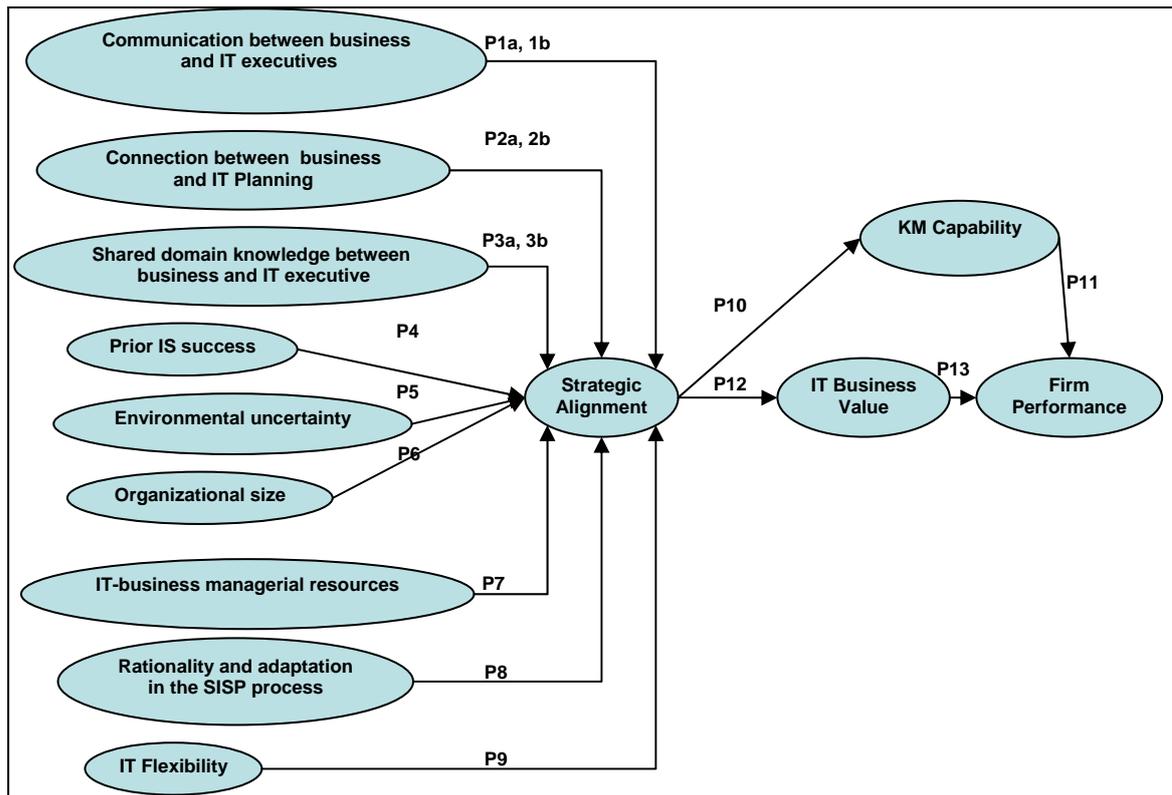


Figure 1. A causal model.

## 2. Connection between business and IT planning

While Luftman and Brier (1999) defined business goals and visions to facilitate alignment, researchers have viewed how planning processes foster alignment between business and IT strategy. For example, Lederer and Burky (1989) had shown that high involvement by IT executives in business planning gives IT executives a better understanding of top management objectives. Zmud (1988) supported the idea of the importance of involving the IT personnel in the planning process through IT partnership with business to successfully introduce new technologies. Teo and King (1997a) used a four-stage typology to gauge the level of planning and integration between business and IT. They found that the higher the degree of integration, the fewer the problems encountered during planning, and the higher the IT contribution to organizational performance (Teo and King 1999). Reich and Benbasat (2000) found a similar relationship between business-IT planning processes and alignment. Hence, by engaging business and IT executives in a bilateral process of business-IT planning, this is likely to increase alignment. This has led to the following set of propositions.

Proposition 2a. *An increase in bilateral fit in business-IT planning will contribute to a higher level of integration which in turn will increase alignment.*

Proposition 2b. *Unilateral BS or ITS fit in the business-IT integration planning will slow down integration which in turn will decrease alignment.*

## 3. Shared knowledge between business and IT

This factor concerns the level of mutuality in knowledge sharing and transfer. Chan et al (2006) argued that reciprocal exchanges of business and IT knowledge between business and IT executives (Tallon et al. 2000) not only improve shared understanding but also promote common vision. Vitale et al. (1986) argued that top managers that lack IT knowledge will invariably inhibit alignment. Hence it is important that business executives should be familiar with IT and technologies, and use that knowledge to augment their business knowledge (Sambamurthy and Zmud 1999). Nelson and Coopriider (1996) defined shared knowledge construct as the understanding and appreciation among IT and business managers for the

technologies and processes that influence their mutual performance. Reich and Benbasat (2000) described shared domain knowledge as the ability of IT and business executives to understand each other perspectives; contribute to each other's input processes; and respect the contributions and challenges made by one another. They found that shared domain knowledge promotes both short-term and long-term alignment. Therefore, we formulate the following propositions:

Proposition 3a. *An increase in IT knowledge in formulating the unilateral BS fit will positively predict alignment.*

Proposition 3b. *An increase in BS knowledge in formulating the unilateral ITS fit will positively predict alignment.*

#### **4. Prior IT success**

This factor concerns the drivers towards a successful relationship with the vendors. Essentially, the key driver is the level of involvement of business and IT executives in the vendor selection, contract negotiation and management, and the design and implementation of the IT projects. Martins and Kambil (1999) asserted that past experiences of IT success will determine the perceptions of managers towards new or future IT strategic opportunities. Put simply, a past system failure could lose credibility with both top executives and the end-users (Luftman et al. 1999). Dahlberg and Kivijärvi (2006) suggested that beliefs related to IT knowledge, attitudes and past experiences could be seen as a main contingency factor that affects strategic alignment. Rockart et al. (1996) argued that a successful IT track record is likely to develop its relationships with business at all levels. Luftman and Brier (1999) and Reich and Benbasat (2000) found that the track record of IT personnel namely its ability to meet its previous commitments, enabled alignment. Chan et al. (2006) explained that competent IT colleagues are more probable to be trusted and consulted in the decision-making processes; therefore, they are more aware of the developments of new business and operate within the emerging business requirements. In addition, Chan et al. (2006) suggested that past credibility gaps can not be ignored by managers and have to be considered as a high priority to address any outstanding credibility issues that business executives might have with IT. This has led to the following proposition.

Proposition 4. *Prior IT success is essential to enhance IT credibility and affects the level of unilateral BS fit to warrant alignment.*

#### **5. Environmental uncertainty**

Uncertainty embodies the differences between the information needed to perform a task and the information available (Galbraith 1977). While Sabherwal and Kirs (1994) argued that alignment could be achieved in more certain environments, some of the needed information within uncertain environments may be not available to make comprehensive decisions which could reduce harmony among organizational components. Thus, in the uncertain environments, IT can help firms deal with environmental uncertainty by increasing their ability to process information which in turn assists IT strategic utilization (Reich and Benbasat 1990). Therefore, managers are expected to put more trust on IT, invest more into it, and enhance the IT-business strategic alignment (Johnston and Carrico 1988). Sabherwal and Kirs (1994) found that IT management positively influenced alignment, whereas both factors of environmental uncertainty and organizational integration did not. Chan et al. (2006) found that environmental uncertainty as formative construct was correlated positively with alignment. Against this body of literature, we formulate the following proposition.

Proposition 5. *An increase coverage of how to deal with environmental uncertainty in formulating the ITS fit will positively predict alignment.*

#### **6. Organizational size**

Nohria and Gulati (1995) defined organizational slack as the resources available which respond to changes or to invest in new projects. However, larger organizations have more

entrenched routines and are likely to inherit legacy systems. This makes the business executives more reluctant to change their business strategies. Hence, unilateral ITS fit becomes more salient and critical to the success of IT projects. On the other hand, larger organizations will have more slack resources to compensate for the disadvantages of unilateral ITS fit. The compensation is achieved through investing into acquiring more co-specialized assets to realize alignment. Hale and Cragg (1996) argued that the larger the organizational size, the higher the chance that the business executives will introduce formal processes and structures to warrant alignment. This has led to the following proposition.

*Proposition 6. In contrast to smaller counterparts, larger organizations have more slack resource to support unilateral ITS fit which in turn increases alignment.*

### **7. IT-managerial resources**

This factor concerns specifically the allocated managerial resources to IT. Luftman et al. (1999) identified six inhibitors to affect IT-business alignment strategy. They include: a lack close relationship between IT and business; poor prioritization of IT resources; IT failure to meet its commitments; a lack of IT understanding of business; and a lack of managerial buy-in and support of IT, and a lack of IT leadership. Most of these inhibitors underline the absence of delegated managerial resources which are part of the co-specialized assets for a firm to realize the potential values of IT (Davern and Kauffman 2000). These managerial resources include that senior executive support for IT; that IT understands the business; and that IT demonstrates leadership. Reich and Benbasat (2000) found a positive relationship between the managerial resources and the social dimension of alignment. Motjolopane and Brown (2004) examined the construct of IT managerial resources and found it to positively influence alignment. Similar to organizational size, an increase in IT-managerial resources will help to compensate the disadvantages of either BS or ITS fit. State formally:

*Proposition 7. IT-managerial resources will positively predict alignment.*

### **8. Strategic information systems planning (SISP)**

Lederer and Salmela (1996) proposed a theory of strategic information systems planning (SISP) and considered alignment as the central consequence. The SISP is essentially a formalized way of enriching three key aspects of flow planning: comprehensiveness, formalization and control focus. For flow planning, it can be either a “top down” or a “bottom up” process. Fredrickson (1984, p. 447) defines comprehensiveness as “the extent to which an organization attempts to be exhaustive or inclusive in making and integrating strategic decisions”. Formalization refers to the existence of structures, techniques, written procedures, and policies which guide the planning process (Dutton and Duncan 1987). Control focus refers to the balance between creativity and control orientations inherent in the strategic planning system (Chakravarthy 1987). In deploying SISP as one of the success measures, Segars and Grover (1999) found that planning systems which reveal features of rationality and adaptation are positively related to planning effectiveness. With high planning comprehensiveness and formalization and control focus, formalized planning systems including SISP helps to foster a more effective top-down communication of the underlying rationality which in turn facilitates participation in strategic planning and adoption at the consumption ends. This has led to our eighth proposition:

*Proposition 8. Organizations that adopt rigorous forms of planning systems (e.g. SISP) to shed light on the rationality and creativity of business planning are most likely to facilitate unilateral and bilateral fits, and in turn enhance alignment.*

### **9. IT flexibility**

Mckay and Brockway (1989) explained IT infrastructure as the enabling foundation of shared IT capability which the whole business depends on. Weill (1993) argued that IT infrastructure should be flexible to be capable to hold the increasing customer demands without further costs. Duncan (1995) illustrated IT infrastructure flexibility in terms of connectivity,

compatibility, and modularity. Connectivity and compatibility are linked to the idea of reach and range (Keen 1991), which concern the sharing of a common set of IT resources with internal and external users. Duncan (1995) defined connectivity as “the ability of any technology component to attach to any of the other components inside and outside the organizational environment”. Byrd and Turner (2000, p. 172) stated that compatibility as “the ability to share any type of information across any technology component”, and modularity as “the ability to add, modify and remove any software, hardware or data components of the infrastructure with ease and with no major overall effect”. Few empirical studies tested if IT infrastructure flexibility enables strategic alignment (Ness 2005). We argue that an increase in IT infrastructural flexibility will compensate the disadvantage of unilateral ITS fit by enhancing the scope of the unilateral ITS fit. This has led to the following proposition.

*Proposition 9. IT infrastructural flexibility will increase the ITS fit to business requirements and in turn increase alignment.*

To sum up, the first three propositions emphasize the importance of bilateral over unilateral fit; proposition 4 concerns the specific role of IT in dealing with environmental uncertainty; proposition 5 underlines the impact of prior transactions with external IT vendors on shaping the perception of business executives; and propositions 6 to 9 examines various conditions of how firms can compensate the disadvantages of unilateral ITS fit especially when business executives are resistant to change their business strategy.

## **Intermediary factors propositions**

### **1. KM capability**

With the causal link between KM capability and financial firm performance (Teece 1998), researchers have since argued for examining the intermediary role performed by KM capability between IT-strategic management and firm performance (e.g. Eisenhardt and Santos 2002). Yet there is a research void on the relationships among IT, KM capability, and firm performance. Tanriverdi (2005) defined KM capability as a second-order construct comprising of three first-order dimensions: product, customer and managerial KM capability. All three are said to complement each other. Product KM capability can not only cut costs but also boost the speed of new product and service developments. Firms that are capable of managing their customer knowledge (customer needs, purchase behaviours, and preferences) and managerial knowledge (knowing how to manage their employees, suppliers, and partners) can enhance their performance. Tanriverdi and Venkatraman (2005) argued that organizations which seek to utilize knowledge for greater firm performance need to focus on knowledge resources and the processes that create, exploit, and renew them. Hence, the role of IT is one of informing and sharing knowledge, and notably promoting effective reuse of knowledge resources. Using IT relatedness as a second-order construct (comprising of relatedness of IT infrastructure, IT strategy-making processes, IT vendor management processes and IT-human resources management processes), Tanriverdi (2005) empirically tested its significance to firm performance, and found that IT relatedness which promoted knowledge reuse contributed significantly to the financial performance of multi-business firms. Hence, firms that incorporate IT relatedness into their ITS are most likely to increase their performance. This has led to the following proposition.

*Proposition 10: IT-alignment that emphasizes IT relatedness will increase KM capability.*

*Proposition 11: KM capability in turn mediates the relationship between IT-alignment and firm performance.*

### **2. IT-Business value**

Researchers have shown that strategic alignment is correlated with firm performance (Sabherwal and Chan 2001), IT-business value (Tallon et al. 2000), IS effectiveness (Chan et al. 1997), and competitive advantage (Kearns and Lederer 2001). However, while economic studies defined IT business value in terms of productivity, IT business value has been

measured from an organizational perspective and showed a positive correlation with objective measures (Dess and Robinson 1984). Mooney et al. (1995) developed a process-oriented framework suggesting that firms gain business value through the impact of IT on the intermediate business processes. They identified ten key intermediate business processes including organizational efficiency; organizational effectiveness; inter-organizational coordination; customer relations; supplier relations; competitive dynamics; marketing support; product and service enhancement; production economies; and business innovation.

Tallon et al. (2000) developed a similar process-oriented model to evaluate the impacts of IT on IT business value. They found that firms' IT objectives can be categorized into unfocused, operation focus, market focus and dual focus. Unfocused firms have neither clear IT goals nor directions. Operations-focus firms have clearly defined IT goals of using IT to reduce operating costs, improve quality and speed, and enhance firm effectiveness. Market-focus firms use IT to create or increase business value for their customers. Dual-focus approach uses IT to improve their focus on operations and market and in turn increases market reach and new market creation. Tallon and Kraemer (2003) found that alignment is highest in production, operations and customer relations, and lowest in sales and marketing. They (2003, p. 4) stated that "with the exception of Chan et al. (1997), the empirical literature has remained silent on the degree to which strategic alignment has impacted IT business value (where IT business value mediates the link between strategic alignment and firm performance)". Hence, IT-business alignment which seeks to improve production, operations and customer relations is mostly likely to realize the potential values of IT. Effectively, IT-business value mediates the relationship between strategic alignment and firm performance. This has led to the following propositions.

*Proposition 12: IT-business alignment that harnesses the processes of production, operations and customer relations will increase IT- business value.*

*Proposition 13: IT-business value in turn mediates the relationship between IT-alignment and firm performance*

### **3 Conclusion**

While the present model examines the fit between business strategy and IT strategy (McFarlan 1984, Bergeron and Raymond 1995, Chan et al. 1997, Sabherwal and Chan 2001), it can be extended to examine other types of alignment. This generally follows a holistic conceptualization of fit in terms of co-alignment (e.g. Bergeron et al. 2004), which investigates the impact of fit between strategic integration (bivariate fit between business strategy and IT strategy) and operational integration (bivariate fit between business structure and IT structure) on firm performance.

Although fit or alignment has been measured by using several perspectives including matching (e.g. Venkatraman 1989b), moderation (e.g. Van de Ven and Drazin 1985), mediation (e.g. Chan et al. 1987), gestalt (e.g. Bergeron et al. 2004), co-variation (e.g. Venkatraman 1989b), and profile deviation (e.g. Sabherwal and Chan 2001), the unilateral and bidirectional linkages between business and IT strategy provide a more sensitivity analysis of the required resources and conditions for realizing IT potentials. Future research can not only subject the present framework to empirical tests but also extend it to examine the ordering of unilateral fits to the emergence of bilateral fit. For practitioners, the present framework provides a detailed roadmap to guide the decision-making process and to focus their attention to the significant antecedents and intermediate variables that ultimately affect the bottom-line statistics.

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