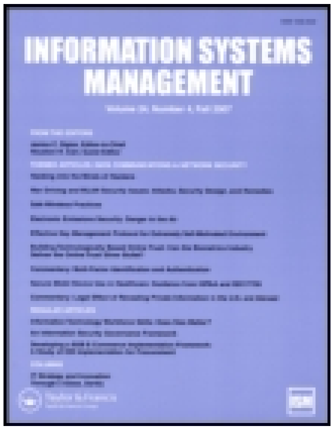

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The Effect of Organizational Factors on the Business Value of IT: Universalistic, Contingency, and Configurational Predictions

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The authors seek to expand the scope of theoretical approaches and organizational factors that are used in concert to examine the effect of organizational factors on IT business value in the present study. They explore the relationships among IT infrastructure capability, a set of five organizational factors, and IT business value using three dominant approaches in organizational research: the universalistic, contingency, and configurational approaches. The ensuing predictions are empirically tested through interviews with senior executives in 57 organizations.

Keywords IT business value; organizational factors; IT infrastructure capability; fit; contingency theory; configurational theory

INTRODUCTION

Research has frequently drawn on contingency theory to account for the business value of information technology (IT), and it has repeatedly used the concept of fit between IT and organizational factors to explain why similar patterns of IT investments are associated with different performance impacts in different firms. However, studies taking such a contingency approach to IT business value have used a limited set of fit perspectives and analytical schemes to model the effect of organizational factors. About 20 years ago, Weill & Olson (1989) emphasized the problem of ill-defined concepts of fit in their critique of the use of contingency theory in information systems research. In the same year, Venkatraman (1989) published a seminal paper on the concept of fit in strategy research, in which he identified six different perspectives of fit—moderation, mediation, matching, gestalt, profile deviation, and covariation—and the corresponding analytical schemes. In the two decades that have passed since these important contributions, studies have typically adopted a single perspective, predominantly the moderation or mediation perspective, to explain how IT-organizational fit creates business value. While researchers have frequently invoked the concept of fit in IT business value research, they have seldom rationalized their choice of perspective or compared alternative perspectives.

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Against this backdrop, a major objective of the authors in this study is to conceptually develop and empirically test alternative predictions of the effect of organizational factors on IT business value. We draw on the organizational literature to identify three dominant approaches: universalistic, contingency, and configurational. We follow the lead of two studies, which applied all three approaches in the context of strategic human resource management (Delery & Doty, 1996) and IT outsourcing (Lee, Miranda, & Kim, 2004). Accordingly, the current study develops universalistic, contingency, and configurational predictions of the relationships among IT infrastructure (ITI) capability, organizational factors, and IT business value. First, the universalistic predictions are based on the assumption that IT business value is independently affected by ITI capability and organizational factors. Second, the contingency predictions are based on the assumption that IT business value is affected by bivariate interactions between ITI capability and organizational factors. Third, the configurational predictions are based on the assumption that IT business value is affected by a multivariate interaction between ITI capability and organizational factors. This study thus contributes to the existing literature by contrasting these three predictions and demonstrating which of the three provides the best explanation of the organizational impacts of IT.

Another important objective of the authors in this study is to offer a comprehensive account of the organizational factors that potentially influence IT business value. Previous contingency studies in the IT literature have naturally emphasized IT factors over organizational factors. Consequently, the majority of these studies explored singular impacts of specific contingency factors (Sambamurthy & Zmud, 1999). In these studies, the researchers typically acknowledged the importance of the organizational context, but they incorporated only the one or two factors that they perceived as being most relevant in the research model (e.g., Devaraj & Kohli, 2000). In contrast, this study emphasizes organizational factors over IT factors. The study examines a broad set of five organizational factors, which include three cultural factors (learning, trust, and openness) and two structural factors (centralization and flatness). Moreover, the study examines these organizational factors both from a reductionistic, contingency approach and from a holistic, configurational approach, thus advancing the literature by showing how the interdependencies among organizational factors are associated with IT business value.

THEORETICAL APPROACHES AND PREDICTIONS

Universalistic Predictions

The universalistic predictions represent the simplest theoretical statements because they imply that the relationship between independent and dependent variables is universal across the population of organizations (Delery & Doty, 1996). To develop the universalistic predictions, it is first necessary to identify the relevant independent and dependent variables, and then to develop arguments that describe the associations between them. In this study, the universalistic predictions describe how ITI capability and organizational factors are independently associated with IT business value.

We broadly define IT business value as the impact of IT on organizational performance, both at the intermediate process level and at the organization-wide level (Melville, Kraemer, & Gurbaxani, 2004). Based on an analysis of the IT business value literature, Melville et al. (2004) described two formulations of performance, efficiency, and effectiveness. Whereas the former "emphasizes an internal perspective employing such metrics as cost reduction and productivity enhancement", the latter "denotes the achievement of organizational objectives in relation to a firm's external environment and may be manifested in the attainment of competitive advantage" (Melville et al., 2004, p. 287). Accordingly, we define IT business value as comprising an operational impact and a strategic impact. The operational impact represents the impact of IT on the efficiency of business processes, such as the facilitation of internal and external collaboration (Sanders & Premus, 2005), the reduction of operating costs, and the improvement of productivity (Tallon, Kraemer, & Gurbaxani, 2000). The strategic impact represents the ability of IT to create a competitive advantage by supporting strategic objectives, such as product differentiation (Belleflamme, 2001) and geographic reach (Tallon et al., 2000).

The IT construct hypothesized in this study to affect IT business value is ITI capability, defined as the base foundation of budgeted-for IT capability, shared throughout the firm in the form of reliable services (Broadbent, Weill, O'Brien, & Neo, 1996). This definition, which describes ITI capability as a firm-wide foundation, explains why ITI capability is hypothesized to have a significant effect on organizational performance. ITI capability provides firms with the ability to share information across different functions, create business standards, exploit business opportunities, and respond to changes in business strategy (Bhatt & Grover, 2005). A non-integrated ITI capability dominated by system incompatibilities severely restricts a firm's business choices (Bharadwaj, 2000). Accordingly, a large stream of research has confirmed the business value of ITI capability (e.g., Armstrong & Sambamurthy, 1999; Fink & Neumann, 2007; Peterson, 2004; Weill, Subramani, & Broadbent, 2002; Zhu, 2004).

Hypothesis 1a. ITI capability is positively associated with IT business value.

An extensive review of the literature on IT business value reveals that no standard typology exists for identifying and classifying relevant organizational factors, mainly because of the prevailing tendency to investigate isolated organizational factors. Drawing on the extant IT business value literature, we argue that five organizational factors, three cultural factors, and two structural factors, have been shown to potentially affect IT business value. The first organizational factor is learning. Organizational learning is a concept used to describe how organizations achieve higher performance through their ability to learn from past experiences (Senge, 1990). Robey & Boudreau (1999) noted that the importance of organizational learning to IT was established by Argyris (1977), "who argued that the contradictions inherent in systems implementation could be resolved through the type of authentic communication he prescribed as part of organizational learning" (Robey & Boudreau, 1999, p. 178). Following this logic, organizations with a better ability to utilize their experience and knowledge to improve their performance should be in a superior position to gain business value from IT (Bhatt & Grover, 2005; Tippins & Sohi, 2003). Many of the challenges associated with IT adoption can be met more effectively in organizations that possess strong learning abilities (Ravichandran, 2005). The dynamic capabilities perspective views learning as central to a firm's ability to adapt and modify its activities for the purpose of developing more effective routines (Teece, Pisano, & Shuen, 1997). Therefore, learning should positively influence IT business value because of its positive effects on organizations' ability to analyze the consequences of IT implementation, to redesign business processes accordingly, and to transition smoothly from one set of routines to another.

The second organizational factor identified in the literature is trust, which is generally defined as the willingness of a party to be vulnerable to the actions of another party (Mayer, Davis, & Schoorman, 1995). Kumar, van Dissel, & Bielli (1998) were among the first to underscore the importance of trust for successful IT implementation. They argued that the dominant technical-economic and socio-political perspectives are insufficient to explain system failure, and that a third rationality of information systems, that of trust and collaborative relationships, should be introduced to study the role of IT in organizations. Ross, Beath, & Goodhue (1996) suggested that IT business value depends on a firm's relationship asset, which is reflected in the ability of IT and business unit management to share the risk and responsibility for the effective application of IT in the firm. Because shared risk and responsibility cannot evolve in the absence of trust, trust represents an organizational factor that is expected to positively affect IT business value.

The third organizational factor is openness. An open organization is characterized by a culture of open relationships with minimal formalization and bureaucracy (Powell & Dent–Micallef, 1997). In one of the few studies taking a more comprehensive approach to organizational factors in the context of IT business value, Powell and Dent–Micallef (1997) concluded that open organization and open communication are the cultural variables most frequently linked with IT performance. The rationale behind the positive effect of openness on IT business value is that the benefits of IT lay in its ability to facilitate information sharing throughout an organization, and that cultural or structural restrictions negate this ability (Zuboff, 1988).

The three organizational factors discussed thus far, learning, trust, and openness, are cultural in nature. However, the literature has also discussed the impact of two structural factors—centralization and flatness—on IT performance. Centralization relates to the decision authority structure in an organization, and flatness relates to the number of hierarchy levels in an organization. The relationship between IT and the structure of organizational decision authority has been debated among researchers since the first computerized systems entered organizations in the 1950s. The debate revolved around the question of whether IT leads to centralization, that is a greater concentration of decision authority at the top of the organization, or to decentralization, meaning dispersed decision authority down and outward in the organization (George & King, 1991). Crowston & Malone (1994) noted that centralization is perhaps the organizational factor most commonly associated with IT. They suggested that when the use of IT is considered as a means of lowering the cost of coordination, IT is expected to be associated with increased centralization. However, IT may also be associated with decentralization for motivational reasons, because managers may want to empower employees by encouraging the decentralization of decisions (Crowston & Malone, 1994). Hitt & Brynjolfsson (1997) empirically confirmed the complementarity between IT and decentralization, and provided support for the notion that IT may have more value when the organization is characterized by decentralized authority. Their conclusions about the positive relationships among IT, decentralization, and organizational performance were supported by other studies (Andersen & Segars, 2001; Chen, 2007).

The fifth and last organizational factor is flatness. The positive association between IT and flatness also dates back to the 1950s, when Leavitt & Whisler (1958) predicted that the use of IT would lead to the demise of middle management (Crowston & Malone, 1994). This prediction was based on the notion that the number of hierarchy levels in organizations should decrease as computers are used to perform the functions of middle management. Because IT can automate decisions and make information widely accessible throughout the organization, top managers can bypass middle managers in organizational communications (Pinsonneault & Kraemer, 2002). Accordingly, the use of IT increases managers' span of control and allows them to effectively supervise a larger number of employees and activities. The above discussion leads to another universalistic prediction about the association between organizational factors and IT business value.

Hypothesis 1b. Organizational factors (learning, trust, openness, decentralization, and flatness) are positively associated with IT business value.

The literature offers different accounts of the direction of causality in the relationships between IT and organizational constructs. However, because the IT construct of interest in the universalistic predictions is IT business value— the organizational performance impacts of IT—the above theoretical discussion is guided by the assumption that organizational factors affect IT business value and not vise versa.

Contingency Predictions

Contingency predictions involve more complexity than universalistic predictions because they describe interactions rather than simple bivariate associations (Delery & Doty, 1996). Contingency theory, one of the most dominant theories in the study of organizational design and performance, is based on the assumption that there is no single best way to organize and that any particular way of organizing is not equally effective under all conditions (Galbraith, 1973; Ginsberg & Venkatraman, 1985). Central to this theory is the proposition that the structure and process of an organization must fit its context for it to be effective (Drazin & Van de Ven, 1985). Whereas the universalistic approach suggests that IT business value is independently affected by ITI capability and organizational factors, the contingency approach suggests that IT business value is affected by the interaction between ITI capability and organizational factors. The conceptualization of fit as interaction is considered one of the most dominant conceptualizations of fit in organizational research (Drazin & Van de Ven, 1985; Schoonhoven, 1981; Venkatraman, 1989). According to Schoonhoven (1981), "when contingency theorists assert that there is a relationship between two variables . . . which predicts a third variable . . . , they are stating that an interaction exists between the first two variables" (p. 351). The conceptualization of fit as interaction is theoretically and analytically similar to conceptualizations of fit as moderation (Venkatraman, 1989). Such conceptualizations of fit have frequently been used in IT business value research (e.g., Li & Ye, 1999; Oh & Pinsonneault, 2007; Parthasarthy & Sethi, 1993).

The contingency approach supports the notion of a complementarity between IT and organizational factors, according to which the marginal benefit of adopting one factor increases with the adoption of the other factor (Hitt & Brynjolfsson, 1997). Arguments for the complementarity between IT and organizational factors have been frequently used to justify the business value of IT. For instance, Clemons & Row (1991) argued that IT, because of its ability to manage interactions among economic activities, can lead to sustainable competitive advantage when it is used to leverage structural differences among organizations. These arguments have generally been developed from a resource-based view of the relationship between IT and firm performance (e.g., Powell & Dent–Micallef, 1997; Ravichandran & Lertwongsatien, 2005; Zhu, 2004). In the present study, the contingency approach perceives ITI capability and organizational factors as complementary. Specifically, the contingency approach regards ITI capability as a necessary but insufficient condition for IT business value. Therefore, when ITI capability is low, increasing any organizational factor would have no effect on IT business value. Conversely, when ITI capability is high, increasing any organizational factor would have a positive effect on IT business value. The contingency approach predicts that this interaction effect exists for all five organizational factors. Organizational learning, trust, openness, decentralization, or flatness are not expected to increase IT business value in organizations in which ITI capability is low. In contrast, these five organizational factors are expected to significantly increase IT business value in organizations in which ITI capability is high. These contingency predictions draw on the same literature as the universalistic predictions. The main difference between the two sets of predictions is the assumption about the necessity of ITI capability to IT business value, based on studies that have underscored the strategic importance of ITI capability (e.g., Armstrong & Sambamurthy, 1999; Broadbent et al., 1996; Fink & Neumann, 2007; Weill et al., 2002; Zhu, 2004).

Hypothesis 2. The association between organizational factors (learning, trust, openness, decentralization, and flatness) and IT business value is contingent on ITI capability.

Configurational Predictions

Configurational predictions are the most complex among the three approaches because of the unique assumptions of configurational theory about the relationships among environment, strategy, structure, and performance. Configurational theory perceives organizations as coherent patterns of factors (i.e., configurations) that are posited to be maximally effective (Delery & Doty, 1996; Miller, 1986; Mintzberg & Lampel, 1999). These configurations represent higher-order interactions that cannot be represented with traditional bivariate contingency theories (Delery & Doty, 1996; Doty & Glick, 1994). Thus, configurational theory rejects the dominant contingency perception of organizations as amalgams of multiple factors that can vary independently and continuously, and instead perceives organizations as tight constellations of mutually supportive factors (Meyer, Tsui, & Hinings, 1993). Whereas contingency research represents a reductionistic analysis of unidirectional linear relationships that downplays complex forms of interaction to statistically isolate the effects of each factor, configurational research represents a holistic analysis of bidirectional nonlinear relationships that seeks to identify complex forms of interaction (Meyer et al., 1993).

The configurational approach assumes that configurations are ideal types, in the sense that they represent theoretically coherent patterns. Therefore, a small number of configurations should account for a large proportion of high-performing organizations (Miller, 1986). This prediction is based on an assumption of equifinality, which refers to a situation in which two or more configurations can be equally effective in achieving high performance (Fiss, 2007). The main objective of a configurational approach to IT business value is thus to identify theoretically derived, internally consistent configurations of organizational factors, and then to link these ideal configurations to ITI capability in a manner that maximizes IT business value.

In this study the authors identify two ideal configurations of organizational factors: an "organic" configuration and a "mechanistic" configuration. The distinction between organic and mechanistic organizations is deeply rooted in the organizational literature (Burns & Stalker, 1961; Khandwalla, 1977). According to Slevin & Covin (1990), "an organic organization is more adaptable, more openly communicating, more consensual, and more loosely controlled", whereas "the mechanistic organization tends to be much more traditional, more tightly controlled, and more hierarchical in its approach" (pp. 43–44). This distinction between organic and mechanistic organizations is important for understanding the interaction between IT and organizational form (Lambert & Peppard, 1993; Parthasarthy & Sethi, 1993). Based on this literature, the organic configuration in this study represents organizations with a culture characterized by learning, trust, and openness and a structure characterized by decentralization and flatness. The mechanistic configuration represents organizations with the opposite pattern of organizational factors, meaning it represents a culture characterized by low levels of learning, trust, and openness and a structure characterized by centralization and multiple hierarchy levels. The organic and mechanistic configurations are described in Table 1.

TABLE 1
Ideal organizational configurations

Organizational factor	Mechanistic configuration	Organic configuration
Learning	Low organizational learning capability	High organizational learning capability
Trust	Low level of organizational trust	High level of organizational trust
Openness	An organizational culture characterized by restrictions	An open organizational culture
Centralization	Centralized decision authority structure	Decentralized decision authority structure
Flatness	Large number of hierarchy levels	Small number of hierarchy levels

The next step in the development of a configurational prediction is to link the ideal configurations to ITI capability in a manner that maximizes IT business value. The fundamental prediction of configurational theory is that ideal configurations outperform incongruent configurations. This prediction, however, does not account for the interaction between organizational factors and ITI capability. Such an interaction is explained by the concept of external congruence. In contrast to internal congruence, which refers to the fit among the factors comprising the configuration, external congruence refers to the fit between the configuration and contextual factors external to the configuration. ITI capability is the external factor of importance in this study. Therefore, IT business value should also be contingent on the congruence between the organizational configuration and ITI capability.

However, the two-configuration approach developed above is problematic in the sense that it suggests that only extreme levels of organizational factors are associated with superior performance. The conceptualization that intermediate levels of organizational factors always entail configurational incongruence and inferior performance is particularly problematic in the context of ITI capability, because ITI capability is assumed to be normally distributed across organizations, with many organizations characterized by an intermediate ITI capability. From a theoretical standpoint, it would be difficult to argue that an intermediate ITI capability is congruent with either organic or mechanistic configuration. Therefore, in accordance with Delery & Doty (1996), a third ideal configuration is defined. This configuration, designated the "balanced" configuration, represents organizations with intermediate levels of all five organizational factors.

The configurational prediction suggests that each of the three ideal configurations of organizational factors is congruent with a particular level of ITI capability, and that this congruence leads to superior IT business value. Specifically, the organic configuration is congruent with a high ITI capability, the balanced configuration is congruent with an intermediate ITI capability, and the mechanistic configuration is congruent with a low ITI capability. This configurational prediction is based on the same rationale used earlier in this article to develop the contingency prediction, according to which the business value of learning, trust, openness, decentralization, and flatness increases with ITI capability. The main difference between the two predictions is that the contingency prediction addresses the bivariate interactions between each organizational factor and ITI capability, whereas the configurational prediction addresses the multivariate interaction between all organizational factors, in concert, and ITI capability. The configurational prediction relies on the rationale that organizations characterized by a mechanistic configuration have little to gain from developing a high IT capability. With such a configuration, investments in ITI capability do not deliver the expected business value. Conversely, organizations characterized by an organic configuration possess the best-fitting culture and structure to transform investments in ITI capability into business value (Parthasarthy & Sethi, 1993). This rationale leads to the following configurational prediction, which draws on previous configurational (Delery & Doty, 1996), systems (Drazin & Van de Ven, 1985), and profile-deviation (Venkatraman, 1989) perspectives of fit.

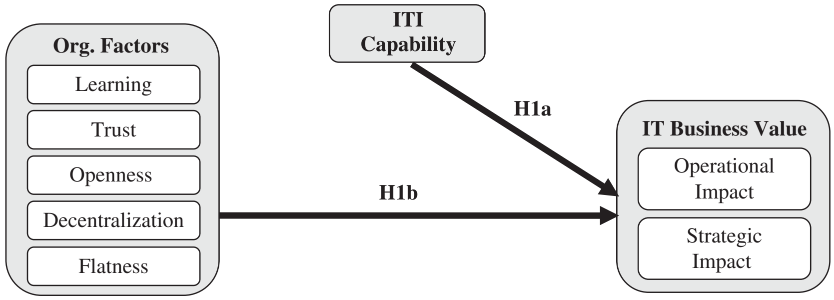
Hypothesis 3. The deviation of an organizational configuration from the ideal configuration that is congruent with its ITI capability is negatively associated with IT business value.

The universalistic, contingency, and configurational predictions developed above are graphically depicted in Figure 1.

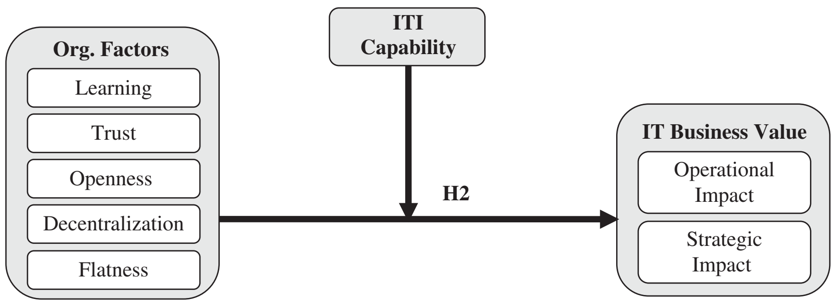
RESEARCH METHODOLOGY

A field study approach was used to empirically test the universalistic, contingency, and configurational predictions. The study identified senior executives as the most appropriate population for testing the different hypotheses. Previous studies commonly used a population of senior executives to test research models of IT business value (e.g., Bhatt & Grover, 2005; Ravichandran & Lertwongsatien, 2005; Tippins & Sohi, 2003), based on the conviction that executives' perceptions of business value are a valid proxy for objective measures of realized value at the organizational level (Tallon & Kraemer, 2007; Tallon et al., 2000).

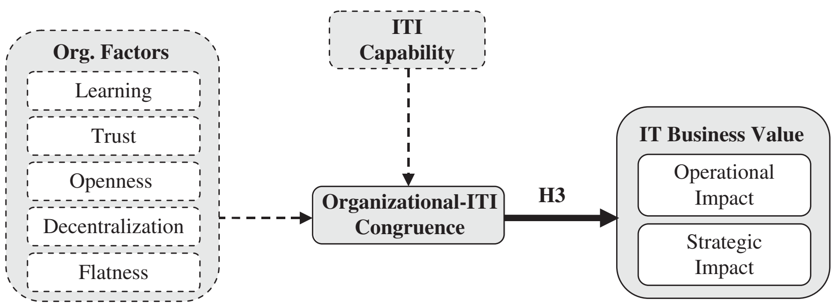
To operationalize the five organizational factors, the literature was surveyed for the observed indicators of each factor. Learning was operationalized by four indicators: knowledge creation, decision making, knowledge implementation, and teamwork. The first three indicators reflected the different stages of organizational learning processes, and the fourth indicator reflected an organizational mechanism associated with knowledge creation and diffusion. Trust was operationalized by three indicators: intra-unit trust (trust within the organizational unit), inter-unit trust (trust across organizational units), and autonomy, which is considered by the organizational and economic literature to be a consequence of trust (Mayer et al., 1995). Openness was operationalized by three indicators: open communication, bureaucracy, and innovation. Innovation was included as an indicator of openness based on studies that found an association between them (Laursen & Salter, 2006). Centralization was operationalized by two indicators reflecting the existence of decentralized structure and operational consensus. Finally, flatness was operationalized by two indicators reflecting the existence of flat structure and strategic consensus. Research suggested that complementarities exist between IT and organizational consensus (Powell & Dent–Micallef, 1997). The present study, however, distinguished between operational consensus (expected to increase with the extent to which decision authority is centralized) and strategic consensus (expected to increase as the hierarchical distance between top managers and employees decreases). This distinction relied on the perception of operational consensus as a "horizontal" dimension, reflecting the operational variance across



(a) Universalistic predictions



(b) Contingency predictions



(c) Configurational predictions

FIG. 1. Theoretical predictions.

organizational units, and strategic consensus as a "vertical" dimension, reflecting the strategic variance across hierarchy levels.

To operationalize ITI capability and IT business value, three scales were constructed. Based on Weill et al. (2002), who developed a comprehensive framework of ITI capability, the first scale measured ITI capability with a set of eight indicators, which assessed the existence of ITI standards, integration of data among enterprise systems, uniform access to all information systems, data management processes, network-based processes, risk management and security processes, a policy for IT development and implementation, and an ability to redesign business processes using enterprise systems. Based on Melville et al. (2004), two additional scales were constructed to measure the two dimensions of IT business value: operational impact and strategic impact. Operational impact was measured with six indicators, which assessed the extent to which IT improves the transparency of operational processes, the efficiency of operational processes, the sharing of operational information among business units, the flexibility to change operational processes, the availability of information for managing change, and the availability of on-demand information for decision-making. Strategic impact was measured with nine indicators, which assessed the extent to which IT improves the ability to rapidly develop new products and services in response to changing customer demands, to catch up with competitors, to provide unique products and services, to execute operational processes in a unique manner, to manage customer relations, to achieve annual objectives, to identify market trends and new market segments, to penetrate new markets, and to expand geographically. All indicators used in this study to measure organizational factors, ITI capability, and IT business value are presented in the Appendix.

Our approach to data collection was to interview a single informant per organization from medium to large organizations operating in the Israeli market. We preferred interviews over self-administered surveys as the method of data collection because the assessment of organizational factors, such as trust and openness, required more intensive interaction with the target population of senior executives. The interview served two main purposes. The first purpose was to enable the conditions under which the executive is not threatened by the questions and the second purpose was to base the executive's assessments on dialogues with the interviewer. Our approach was based on the assumption that a non-threatening situation and intensive dialogues were necessary to elicit valid assessments of organizational factors.

Based on this approach, one of the authors conducted interviews with senior executives in 63 organizations. Random (probability) sampling is the best method of drawing an unbiased sample from a population. However, random sampling requires having a list of all members of the population (i.e., a sampling frame), which is generally impractical if the population is large (Graziano & Raulin, 2007). We thus aimed at maintaining the validity of the sample by randomly targeting medium to large organizations, across a range of industries in Israel, without the use of a sampling frame (Dyer, 2006). Our sampling strategy was to target key organizations in various industries, such as manufacturing, research and development, services, and retail. Senior executives in these organizations were asked to participate in the study. Three executives refused to participate for reasons of confidentially and time constraints, resulting in a sample of 63 interviews. The interviews were conducted between September 2007 and February 2008. Each interview took about an hour, during which the objectives of the study were presented and data were collected. While the interview included intensive dialogues between the interviewer and the executive, particularly about organizational factors, the executive was prompted to provide a numerical Likert-type assessment of each indicator. These assessments were used for data analysis. Of the 63 interviews, six were dropped because the executive could not provide valid assessments of both IT and organizational indicators. The remaining 57 interviews included the assessments of senior executives in various industry sectors: manufacturing (38.6%), research and development (26.3%), services (24.6%), and retail (10.5%). Analysis of variance (ANOVA) tests showed that the variable of industry sector did not bias the data (only four indicators showed significant differences across industry sectors). Sample characteristics are presented in Table 2.

TABLE 2
Sample characteristics

Characteristic (valid N)	Frequency	Percent
Industry sector (57)		
Manufacturing	22	38.6%
Research and development	15	26.3%
Services	14	24.6%
Retail	6	10.5%
Number of employees (57)		
100 or less	7	12.3%
101–250	11	19.3%
251–500	11	19.3%
More than 500	28	49.1%
Geographical reach (57)		
Global	45	78.9%
Local	12	21.1%
Competitiveness of the industry (56)		
Very low	3	5.4%
Low	6	10.7%
Intermediate	4	7.1%
High	23	41.1%
Very high	20	35.7%
Reporting level of the top IT executive (49)		
Chief Financial Officer	10	20.4%
Chief Operations Officer	21	42.9%
Chief Executive Officer	18	36.7%

DATA ANALYSIS

Using a single method to measure all the constructs in a study typically raises concerns of common method bias. To address these concerns, we used Harman's single-factor test, which is one of the most widely used techniques to test for common method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). The technique loads all of the measures in a study into an exploratory factor analysis and examines the unrotated factor solution. The basic assumption of the technique is that if a substantial amount of common method variance is present, either a single factor will emerge or one general factor will account for the majority of the covariance among the measures (Podsakoff et al., 2003). A principal component analysis (PCA) with all the indicators used in the present study resulted in 11 factors (eigenvalues greater than 1.0), with the first factor accounting for only 27.9% of the variance. This analysis suggested that common method variance was not significant in the collected data.

The first step of data analysis involved using a PCA to transform the 14 organizational factor indicators into the five organizational factors (learning, trust, openness, centralization, and flatness). This technique was used because the PCA extracts orthogonal factors that overcome the problem of multicollinearity. Furthermore, PCA is more appropriate when the constructs are inherently formative (Petter, Straub, & Rai, 2007). The use of formative constructs renders an internal consistency perspective inappropriate for assessing construct validity (Diamantopoulos & Winklhofer, 2001), which instead should be assessed by using PCA and examining the matrix of factor loadings (Petter et al., 2007). The resulting Varimax-rotated component matrix for organizational factors, shown in Table 3,

TABLE 3
Rotated component matrix for organizational factors

	Organizational factor				
Indicator	Learning	Trust	Openness	Centralization	Flatness
Knowledge creation	**.854**	–.012	.099	–.042	–.080
Decision making	**.711**	.368	–.098	.068	.190
Knowledge implementation	**.830**	.083	.150	.031	.007
Teamwork	**.528**	.468	–.167	.326	–.143
Intra-unit trust	.041	**.713**	.093	.169	.217
Inter-unit trust	.101	**.819**	.218	.033	.005
Autonomy	.211	**.632**	.258	–.268	.051
Open communication	.267	.351	**.631**	.000	.122
Bureaucracy	.253	–.064	**–.846**	–.163	–.014
Innovation	.351	.204	**.599**	.051	.223
Decentralized structure	–.009	.143	–.138	**–.842**	.006
Operational consensus	.097	.429	.056	**.714**	.215
Flat structure	–.190	.118	.027	–.031	**.730**
Strategic consensus	.294	.053	.229	.189	**.715**

The PCA extraction method and Varimax rotation method were used.

confirmed that each of the 14 organizational factor indicators loaded above the 0.5 threshold on its respective factor, with cross-loadings below this threshold (Hair, Black, Babin, Anderson, & Tatham, 2006). The same technique was used to compute the scores for ITI capability and IT business value. The resulting component matrix for ITI capability is shown in Table 4, and the Varimax-rotated component matrix for IT business value is shown in Table 5. The initial PCA of the 15 indicators of IT business value showed that one of these indicators (SI5) loaded above 0.5 on both operational impact and strategic impact. Hence, this indicator was dropped from further analyses. As can be seen in Table 5, the remaining 14 indicators of IT business value loaded above 0.5 only on their respective factors (either operational impact or strategic impact). Factor scores were calculated using the regression method (a refined method), which maximizes the validity of estimates (DiStefano, Zhu, & Mindrila, 2009). The factor scores generated from these analyses were used to assess the universalistic, contingency, and configurational predictions.

TABLE 4
Component matrix for ITI capability

Indicator	ITI capability
IC1	.690
IC2	.705
IC3	.772
IC4	.553
IC5	.675
IC6	.655
IC7	.795
IC8	.677

The PCA extraction method was used.

TABLE 5
Rotated component matrix for IT business value

	IT business value	
Indicator	Strategic impact	Operational impact
OI1	.108	**.751**
OI2	.196	**.798**
OI3	.046	**.819**
OI4	.463	**.646**
OI5	.352	**.724**
OI6	.208	**.836**
SI1	**.687**	.324
SI2	**.790**	.192
SI3	**.885**	.261
SI4	**.823**	.146
SI6	**.560**	.421
SI7	**.878**	.164
SI8	**.923**	.149
SI9	**.687**	.114

The PCA extraction method and Varimax rotation method were used.

Assessment of the Universalistic Predictions

Following Delery & Doty (1996), we conducted three types of analyses to test Hypothesis 1a (universalistic effect of ITI capability on IT business value) and Hypothesis 1b (universalistic effect of organizational factors on IT business value). The first analysis involved a set of Pearson correlations between ITI capability, organizational factors, and IT business value factors (the correlations among organizational factors were meaningless because they were orthogonal factors extracted via a PCA). Correlation coefficients, presented in Table 6, suggested that the universalistic predictions were partially supported. The correlation of ITI capability with operational impact ($r = 0.618$, $p < 0.001$) was stronger than its correlation with strategic impact ($r = 0.229$, $p < 0.10$). Of the five organizational factors, three were significantly correlated with IT business value: learning and trust were correlated with operational impact ($r = 0.266$, $p < 0.05$; $r = 0.349$, $p < 0.01$), and flatness was correlated with strategic impact ($r = 0.267$, $p < 0.05$).

In accordance with Delery & Doty (1996), we primarily used hierarchical regressions to test the hypotheses of this study. The main reason for doing so was the necessity to control for the confounding effects of organizational size, which has been the most dominant variable in the literature on organizational structure (Haveman, 1993). Organizational size was operationalized in this study as the number of employees in the organization (Table 2). In all of the hierarchical regressions we performed in this study, organizational size was entered first, and the effects of interest were entered in subsequent steps.

The second universalistic analysis used operational and strategic impacts as the dependent variables in a set of hierarchical regressions, in which only one factor was independently entered into the equation after organizational size had been entered. The results showed that ITI capability significantly increased the level of explained variance in operational impact ($\Delta R^2 = 0.414$, $p < 0.001$), but not in strategic impact ($\Delta R^2 = 0.040$, $p = 0.134$). The results corroborated the correlation results, and showed that learning and trust were significantly associated with operational impact ($\Delta R^2 = 0.072$, $p < 0.05$; $\Delta R^2 = 0.122$, $p < 0.01$), and that flatness was significantly associated with strategic impact ($\Delta R^2 = 0.082$, $p < 0.05$).

TABLE 6
Pearson correlations

	ITI capability	Operational impact	Strategic impact
ITI capability		.618***	.229+
Learning	.287*	.266*	.149
Trust	.323*	.349**	–.001
Openness	–.141	.103	–.138
Centralization	.020	.119	–.171
Flatness	.018	–.034	.267*

+$p < 0.10$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$. Two-tailed p values are reported.

TABLE 7
Results of simultaneous hierarchical regressions testing hypothesis 1b

	Operational impact		Strategic impact	
Variable	β	ΔR^2	β	ΔR^2
Organizational size (control)		.000		.018
Organizational factors		.219*		.136
Learning	.264*		.138	
Trust	.351**		.005	
Openness	.111		–.096	
Centralization	.119		–.170	
Flatness	–.031		.282*	
Full equation		.219*		.154

*$p < 0.05$; **$p < 0.01$. Two-tailed p values are reported.

The third universalistic analysis also used hierarchical regressions, but instead of entering each organizational factor independently into the regression equations, all organizational factors were entered simultaneously after organizational size had been entered. The results of the simultaneous hierarchical regressions predicting operational and strategic impacts are summarized in Table 7. Again, consistent with our previous universalistic results, learning and trust were significantly associated with operational impact ($\beta = 0.264$, $p < 0.05$; $\beta = 0.351$, $p < 0.01$), and flatness was significantly associated with strategic impact ($\beta = 0.282$, $p < 0.05$). When entered simultaneously, organizational factors explained an additional 21.9% of the variance in operational impact ($p < 0.05$) and an additional 13.6% of the variance in strategic impact ($p = 0.175$). Overall, the results supported the universalistic predictions for operational impact, but not for strategic impact.

Assessment of the Contingency Predictions

Our approach to testing Hypothesis 2 (contingency effect of ITI capability and organizational factors on IT business value) was similar to our approach to testing Hypotheses 1a and 1b—using hierarchical regressions first to test independent effects, and then to test simultaneous effects (Delery & Doty, 1996). The contingency analyses followed the dominant approach in the literature of modeling fit as interaction/moderation (Schoonhoven, 1981; Venkatraman, 1989). More specifically, the analyses assessed the contingency predictions by examining whether an interaction term between ITI capability and an organizational factor significantly increased the level of explained variance in a hierarchical regression analysis. IT business value research has often modeled contingency relationships between IT and organizational factors by using interaction terms in regression analyses (e.g., Li & Ye, 1999; Oh & Pinsonneault, 2007; Parthasarthy & Sethi, 1993; Pinsonneault & Kraemer, 1997). Accordingly, we conducted 10 hierarchical regression analyses, five predicting operational impact and another five predicting strategic impact. In the first step of each analysis, the control variable of organizational size, ITI capability, and a single organizational factor were entered into the regression equation. In the second step, the interaction term between ITI capability and the single organizational factor was added. The results showed that in none of the 10 hierarchical regression analyses the interaction term significantly increased the explained variance in operational impact or strategic impact, thus providing no support for Hypothesis 2.

Next, we conducted two hierarchical regression analyses (one predicting operational impact and one predicting strategic impact) in which all organizational factors were entered simultaneously instead of independently. In the first step of each analysis, organizational size, ITI capability, and all five organizational factors were entered. In the second step, all interaction terms between ITI capability and each of the organizational factors were added to the regression equation. The results of the simultaneous hierarchical regressions testing Hypothesis 2 are summarized in Table 8. The results indicated that the interaction terms had no significant effect on operational impact. However, the interaction terms, when entered simultaneously, explained an additional 15.7% of the variance in strategic impact ($p < 0.10$). One of the interaction terms, the interaction between ITI capability and centralization, was significantly associated with strategic impact ($\beta = -0.312$, $p < 0.05$). The results suggested that organizations with a higher ITI capability benefited from a higher strategic impact when their organizational structure was characterized by decentralization (the interaction term between ITI capability and centralization was negative). Overall, the results supported the contingency predictions for strategic impact, but not for operational impact.

Assessment of the Configurational Predictions

To test Hypothesis 3 (the effect of the congruence between organizational configurations and ITI capability on IT business value), we followed the analytical approach suggested by Govindarajan (1988), who described ideal profiles of administrative mechanisms. This analytical approach involved four steps. First, scores on the five organizational factors were standardized to range from -1.00 to $+1.00$. Second, the theory-based ideal profiles of organizational factors were operationalized by assigning numerical values to each ideal profile. Consistent with Govindarajan (1988), "the end points on the variables were identified as the ideal values" (p. 841). The resulting ideal profiles for the organic and mechanistic configurations are described in Table 9. Consistent with Delery & Doty's (1996) middle-of-the-road configuration, the ideal profile for the balanced configuration "was specified as the mean value for each of the relevant variables" (p. 816). The ideal profile for the balanced configuration is also described in Table 9.

Third, a deviation score was calculated for each organization in the sample as the Euclidean distance between the organization's scores on the five organizational factors and the scores of the ideal configuration that is congruent with the organization's ITI capability. To calculate the deviation scores, we transformed

TABLE 8
Results of simultaneous hierarchical regressions testing hypothesis 2

	Operational impact		Strategic impact	
Variable	β	ΔR^2	β	ΔR^2
Organizational size (control)				
ITI capability	.590***		.190	
Organizational factors		.477***		.180
Learning	.108		.088	
Trust	.152		–.059	
Openness	.142		–.086	
Centralization	.106		–.174	
Flatness	–.060		.273*	
Interactions		.036		.157+
ITI capability × learning	–.053		.236+	
ITI capability × trust	–.114		–.146	
ITI capability × openness	–.088		–.208	
ITI capability × centralization	.139		–.312*	
ITI capability × flatness	–.038		–.177	
Full equation		.513***		.337+

+$p < 0.10$; *$p < 0.05$; ***$p < 0.001$. Two-tailed p values are reported.

TABLE 9
Ideal profiles of organizational configurations

Organizational factor	Mechanistic configuration	Balanced configuration	Organic configuration
Learning	−1.00	0.00	+1.00
Trust	−1.00	0.00	+1.00
Openness	−1.00	0.00	+1.00
Centralization	+1.00	0.00	−1.00
Flatness	−1.00	0.00	+1.00

Scores are standardized to range from –1.00 to +1.00.

the continuous ITI capability scale into a categorical scale with three values: high (values higher than the mean +0.5 standard deviation), intermediate (values between the mean +0.5 standard deviation and the mean –0.5 standard deviation), and low (values lower than the mean –0.5 standard deviation). This categorization created three relatively equal groups, with 19, 20, and 18 organizations in the high, intermediate, and low ITI capability groups, respectively. The implication of this categorization was that the deviation score was calculated against the ideal organic profile for the first group of 19 organizations with high ITI capability, against the ideal balanced profile for the second group of 20 organizations with intermediate ITI capability, and against the ideal mechanistic profile for the third group of 18 organizations with low ITI capability.

Fourth, Hypothesis 3 was tested by assessing whether the deviation score was negatively associated with IT business value. A Pearson correlation test showed that the deviation score had a significant negative correlation with operational impact ($r = -0.262$, $p < 0.05$), but not with strategic impact ($r = 0.014$, $p = 0.918$). The results appeared to be robust to the specification of the balanced configuration. Sensitivity analyses showed that specifying the balanced configuration anywhere in the range from –0.25 to +0.25 (instead of 0.00) resulted in insignificant changes in the correlations of the deviation score with operational impact (between –0.254 and –0.270) or strategic impact (between 0.027 and –0.022). Next, the results were confirmed by two hierarchical regression analyses, in which the deviation score was entered into the equation after organizational size had been entered. The hierarchical regression analyses indicated that the deviation score somewhat increased the level of explained variance in operational impact ($\Delta R^2 = 0.069$, $p = 0.051$), but not in strategic impact ($\Delta R^2 = 0.0003$, $p = 0.897$). The results supported the configurational prediction for operational impact, but not for strategic impact.

TABLE 10
Summary of results

Approach	Predictions	Main results
Universalistic	H1a: ITI capability is positively associated with IT business value.	ITI capability is positively associated with *operational impact.*
	H1b: Organizational factors are positively associated with IT business value.	Learning and trust are positively associated with *operational impact*, whereas flatness is positively associated with *strategic impact.*
Contingency	H2: The association between organizational factors and IT business value is contingent on ITI capability.	The association between decentralization and *strategic impact* is contingent on ITI capability.
Configurational	H3: The deviation of an organizational configuration from the ideal configuration that is congruent with its ITI capability is negatively associated with IT business value.	The deviation of an organizational configuration from the ideal configuration that is congruent with its ITI capability is negatively associated with *operational impact.*

DISCUSSION

The results of data analysis, summarized in Table 10, indicate that different approaches capture different effects of organizational factors on IT business value. The universalistic approach, with its univariate focus, captures the effects of isolated organizational factors. The universalistic approach consistently shows that learning and trust are positively associated with operational impact, whereas flatness is positively associated with strategic impact. The contingency approach, with its bivariate focus, captures the effects of interactions between isolated organizational factors and ITI capability. The contingency approach shows that strategic impact is affected by a negative interaction between centralization and ITI capability. The configurational approach, with its multivariate focus, captures the effects of interactions between configurations of organizational factors and ITI capability. The configurational approach indicates that the deviation of an organizational configuration from the ideal configuration that is congruent with its ITI capability is negatively associated with operational impact. This spectrum of results may lead to two important conclusions. First, efforts to capture the effects of organizational context on IT business value should consider multiple organizational factors, both cultural and structural. A variety of organizational factors are associated with IT business value, and those factors interact with each other in a manner that cannot be captured across studies. Second, efforts to capture the effects of organizational context on IT business value should use multiple theoretical approaches, fit perspectives, and analytical schemes. Greater theoretical and analytical diversity is crucial for understanding the role of organizational context in creating IT business value because of the complementarities among the different approaches, perspectives, and schemes.

Our results show that the main impacts of ITI capability are operational rather than strategic. This finding aligns well with the notion that the ability of IT to create competitive advantage lies in complex IT and organizational mechanisms of value creation (Kohli & Grover, 2008; Piccoli & Ives, 2005; Sambamurthy, Bharadwaj, & Grover, 2003). In this study, the authors address the need for complexity at the organizational level, but not at the IT level. While ITI capability reflects the impact of IT on organizational performance, this concept cannot represent the entire spectrum of IT resources that may contribute to the strategic value of IT (Bhatt & Grover, 2005). Our results also show that the main impacts of cultural factors, particularly learning and trust, are operational rather than strategic. These findings support the literature that regards learning and trust as organizational factors that facilitate IT implementation, which has positive operational consequences but not necessarily positive strategic consequences (Kumar et al., 1998; Ravichandran, 2005; Robey & Boudreau, 1999).

In accordance with our approach to turn the spotlight on organizational factors, some of these factors are indeed found to be associated with strategic impact. Interestingly, the organizational factors associated with strategic impact are structural rather than cultural. Although this intriguing finding has to be validated in future research, it implies that the ability of IT to influence competitive performance is contingent on such dimensions of organizational structure as decentralization and flatness. Our findings support the notion of a complementarity between IT and decentralization in their effect on financial performance (Andersen & Segars, 2001; Hitt & Brynjolfsson, 1997). The findings validate the approach of Parthasarthy & Sethi (1993), according to which IT "has an independent and immediate beneficial effect on certain internal efficiency measures", while "the translation of these internal benefits into tangible measures of organizational success such as growth and profitability depends on how effectively the strategy and structure choices are designed to exploit them in the marketplace" (p. 531).

IMPLICATIONS, LIMITATIONS, AND FUTURE RESEARCH DIRECTIONS

The contribution of this study to the existing literature is twofold. First, the study takes a comprehensive view of the organizational factors that potentially influence IT business value. Given the tendency of IT business value studies, even those that acknowledge the importance of organizational context, to focus on IT constructs, constructs reflecting the organizational culture and structure have been somewhat neglected. Studies on IT business value included only isolated organizational factors in their research models (e.g., Andersen & Segars, 2001; Tippins & Sohi, 2003), thus limiting the possibility to conduct an extensive analysis of the operational and strategic impacts of organizational context. The view of organizational factors taken in this study is one of few attempts to comprehensively unveil the cultural and structural antecedents of IT business value. Second, this study takes a comprehensive view of the theoretical approaches that may account for IT business value. Despite the recent surge in the number of studies on IT business value, most of these studies rely on either the universalistic or contingency approach. The studies that rely on the contingency approach typically model the relationships between IT and organizational factors as bivariate interactions (e.g., Li & Ye, 1999; Parthasarthy & Sethi, 1993; Pinsonneault & Kraemer, 1997). This tendency limits the ability to understand the multivariate interactions between IT and organizational factors, as well as the complementarities between different theoretical approaches. This study thus advances the IT business value literature by simultaneously developing and testing univariate, bivariate, and multivariate explanations of how organizational factors influence IT business value.

This study also offers implications for practice. Much has been written about the need to consider the organizational context in decisions on IT investments. Managers involved in decisions about the acquisition of IT resources and the design of IT capabilities should pay attention to the complementarities between IT resources and capabilities and the cultural and structural characteristics of the organizational environment. The findings of this study suggest that the most important organizational factors in this regard are learning, centralization, and flatness. Managers in organizations with strong learning mechanisms, decentralized decision authority, and decreased number of hierarchy levels are better positioned to create business value by improving ITI capability. Managers in organizations without these characteristics may find it more difficult to create ITI-based business value. Furthermore, this study suggests that the congruence among organizational factors is more important for IT business value than any isolated organizational factor. For instance, increasing organizational flatness may have a positive effect on IT business value as long as this structural change increases the congruence among organizational factors. However, if this structural change entails a loss of congruence, then it may actually have a negative effect on IT business value. This type of holistic thinking is crucial for managers who seek to gain the most from their IT resources and capabilities.

The present study is not without limitations. The research methodology is limited because of its cross-sectional orientation. The measurement of all constructs at one point in time implies that inferences about causality rely mostly on theoretical justifications. This limitation notwithstanding, our methodological approach is in line with the common methodological practice in studies on IT business value, which are based on the assumption that the organizational impacts of IT follow changes in IT and organizational factors rather than precede them. Nonetheless, our findings should be interpreted with caution because we cannot empirically rule out the possibility of a reversed causality. Another methodological concern may be the relatively small sample size, which is a direct consequence of our decision to collect data through interviews instead of self-administered surveys. The on-site interview methodology substantially limited our ability to engage in the type of large-scale data collection that characterizes postal or web-based surveys. This methodology had direct bearing on the statistical power of the data analysis techniques used in this study. Despite these difficulties, we perceived the interview methodology as important to our ability to collect reliable and valid data about such organizational factors as trust and openness. A third methodological concern is the use of a sampling method that involves no sampling frame. Although our sampling method introduced randomness in the selection of organizations across a range of industries, we cannot rule out the possibility of biased sampling due to the absence of a sampling frame. In such situations, generalizations should be made cautiously and conservatively, predominantly to other organizations having characteristics similar to those of the sample (Graziano & Raulin, 2007). In this regard, we should note again that the data for this study was collected from Israeli organizations. Israel has been very successful in developing a substantial IT industry, which plays a significant role in the Israeli economy (Ein–Dor, Myers, & Raman, 1997). Our sample thus may be more generalizable to organizations in countries with advanced IT business environments, such as the United States and Western Europe, and less generalizable to organizations in countries where advanced IT has not been adopted widely (Fink & Neumann, 2009).

Finally, this study offers numerous directions for future research. First, additional research is needed to address the methodological limitations discussed above. One such direction is to use a longitudinal methodology to empirically pin down the direction of causality and to investigate how IT business value evolves over time in response to changes in IT and organizational factors. Second, although this study takes a comprehensive view of the organizational factors that potentially influence IT business value, we believe that future research should consider even a broader spectrum of organizational factors. We acknowledge that such a comprehensive effort may prove to be overly complicated for studies taking a bivariate contingency approach. Instead, studies should aim at taking a multivariate configurational approach to effectively model and analyze the effects of the internal congruence within organizational configurations and of the external congruence between organizational configurations and IT resources. In conclusion, research has intensively explored the performance impacts of IT-organizational fit. The vast literature on IT-business strategic alignment reflects this emphasis. Future research should continue in this path. Yet, it should broaden the scope of such explorations by turning more attention to cultural and structural organizational factors and to more complex and holistic fit perspectives and analytical schemes. Employing more breadth and depth in the study of how the interaction between IT and organizational factors influences organizational performance has the potential to significantly advance our understanding of the business value of IT.

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APPENDIX: MEASURES OF THEORETICAL CONSTRUCTS

TABLE A1
Measures of organizational factors

Factor	Indicator	Wording
Learning	Knowledge creation	The organization is able to evaluate its performance and identify facilitating and inhibiting factors.
	Decision making	The organization is able to manage an effective process of selecting a business action among several alternatives.
	Knowledge implementation	The organization is able to modify its processes in accordance with past experience and conclusions drawn.
	Teamwork	Employees work together cooperatively as a team in order to accomplish the same objectives.
Trust	Intra-unit trust	Employees have confidence in the sincerity and integrity of other employees within the organizational unit.
	Inter-unit trust	Employees have confidence in the sincerity and integrity of other employees across organizational units.
	Autonomy	Employees feel independent and have a wide range of job responsibilities.
Openness	Open communication	The organization is characterized by formal and informal sharing of information.
	Bureaucracy	Working rules are enforced by role-hierarchy, procedures, and regulations.
	Innovation	The organizational culture fosters change and experimentation.
Centralization	Decentralized structure	The organizational structure is decentralized.
	Operational consensus	There is general agreement in the organization about organizational policies and work practices.
Flatness	Flat structure	The organizational structure is flat.
	Strategic consensus	There is general agreement in the organization about strategic objectives and organizational change processes.

TABLE A2
Measures of ITI capability and IT business value

Factor	Indicator	Wording
ITI capability	IC1	There is a declared policy for IT development and implementation.
	IC2	There is an integration of data among enterprise systems (e.g., ERP, CRM, enterprise portal).
	IC3	There are uniform and obligatory standards for IT infrastructures (e.g., servers, networks, databases).
	IC4	User interfaces are based on uniform access to all information systems.
	IC5	There are IT processes for risk management and security (e.g., disaster planning, fraud avoidance).
	IC6	There are advanced network-based processes (e.g., Intranet, Extranet, electronic markets).
	IC7	There are advanced processes for data management (e.g., central databases, data warehouse, OLAP, enterprise portal).
	IC8	There is an ability to redesign business processes using enterprise systems.
Operational impact	OI1	IT improves the transparency of operational processes.
	OI2	IT improves the efficiency of operational processes.
	OI3	IT improves the sharing of operational information among business units.
	OI4	IT improves the flexibility to change operational processes.
	OI5	IT improves the availability of information for managing change processes.
	OI6	IT improves the availability of on-demand information for decision-making processes.
Strategic impact	SI1	IT improves the ability to rapidly develop new products and services in response to changing customer demands.
	SI2	IT improves the ability to catch up with competitors.
	SI3	IT improves the ability to provide unique products and services that are difficult for competitors to duplicate or substitute.
	SI4	IT improves the execution of operational processes in a unique manner that is difficult for competitors to duplicate or substitute.
	SI5	IT improves the management of customer relations.
	SI6	IT improves the ability to achieve annual objectives.
	SI7	IT improves the ability to identify market trends and new market segments.
	SI8	IT improves the ability to penetrate new markets.
	SI9	IT improves the ability to expand geographically.