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# AN EMPIRICAL INVESTIGATION OF IS STRATEGY AND IS CONTRIBUTION TO FIRM PERFORMANCE

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# AN EMPIRICAL INVESTIGATION OF IS STRATEGY AND IS CONTRIBUTION TO FIRM PERFORMANCE

*Completed Research Paper*

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## **Abstract**

*Given the important impact that an IS strategy has on the potential value IS brings to an organization, we develop and test a model of IS Strategy and Performance. Our survey-based study provides strong evidence that firms with defined IS strategies perform better than those without defined IS strategies. Our study also provides evidence that the two IS defined strategies -- IS Innovator and IS Conservative -- contribute in very different ways to firm performance: the IS Innovator strategy contributes to strategic growth whereas the IS Conservative strategy contributes to firm efficiency. Organizations without a clearly defined IS strategy experienced a negative contribution of IS to firm performance. The different types of performance had differing affects on satisfaction with the IS department and satisfaction with the CIO such that CIOs overseeing an Innovator strategy experience lower satisfaction from their organizations than do CIOs overseeing a Conservative strategy. The lowest performance and satisfaction levels were seen in firms with no IS strategy. Firms with no IS strategy should realize the negative outcomes of such a lack of strategy and work to extricate themselves before a consistent pattern of investing in IS without clear organizational benefit develops.*

**Keywords:** IS Strategy, IS Innovation, IS Performance, IS Innovator, IS Conservative, IS Undefined

## **Introduction**

Absent an information system (IS) strategy, the contribution of IS to organizational performance is likely to be as much a result of serendipity as managerial objective (Galliers, 2007). So important is IS strategy to the potential value IS brings an organization that practice and research have widely emphasized the need to carefully construct an IS strategy with a view towards complementing and/or enabling organizational objectives (Reich and Benbasat, 1996). Otherwise, IS solutions might be both misaligned and maligned as they fail to deliver value for the organization. Indeed, information technologies in and of themselves do not provide value or competitive advantage for firms (Galliers, 2004; 2006). The commodification and standardization of systems ensure that virtually all organizations in an industry have access to similar solutions, at least over time. It is not so much what systems an organization has, but how these systems are employed, that brings value to a firm. As such, it is the act of strategizing about the systems (Galliers, 2007) and the resulting IS strategy, when effectively employed, that may distinguish the performance improvements attributable to IS from one firm relative to others.

Even while much research and practitioner discourse have focused on the process of strategic IS planning (Premkumar and King, 1994; Ward and Peppard, 2002) and strategic IS alignment (Chan and Reich, 2007; Chan, Huff, Barclay, and Copeland, 1997; Henderson and Venkatraman, 1999), less research has delved into the actual content of IS strategy per se. The foundational work on IS strategy, led most notably by Earl (1989) and Galliers (1991) defined IS strategy as comprised of an information strategy, an information technology strategy, an information management strategy, and a change management strategy. Collectively, these components represent the fundamental decision areas entailed in managing IS. Unfortunately, few attempts have been made to operationalize or measure these dimensions of IS strategy. As a result, they have not been widely incorporated into empirical studies, in spite of their extensive influence in conceptual work on IS strategy. Similarly, the strategic alignment research stream has mostly left the IS strategy content unexplored in and of itself, and has focused on the degree to which IS is strategically and structurally (Henderson and Venkatraman 1993; Reich and Benbasat 1996), and more recently informally (Chan, 2002), aligned with the organization. Few studies carefully defined or operationalized the IS strategy component itself. Sabherwal and Chan (2001) is an important exception. They categorize IS strategy as being IS for flexibility, IS for efficiency, and IS for comprehensiveness. While their work makes important progress in the treatment of IS strategy, the categories themselves are not mutually exclusive and reflect more an emphasis on the attributes of a particular information system than a shared perspective of IS.

Recognizing that IS strategy remains a term that is widely utilized but still not fully understood nor readily measured, Chen, Martin, Preston, and Teubner (2010a) develop and operationalize a typology of three IS strategies. They define IS strategy as the organizational perspective on the investment in, deployment, use, and management of information systems. They suggest that an organization's IS strategy falls into one of three categories: IS Innovator, IS Conservative, or IS Undefined. Using the three IS strategies identified by Chen et al., our work develops and empirically tests a theory of IS strategy and firm performance. Only in better understanding the relationship of different IS strategies with performance can we begin to understand the contexts in which one strategy is preferable to another as well as the conditions necessary for the effective application of the strategies. This paper is organized as follows. We next present an overview of the IS strategy typology introduced in Chen et al. (2010a). We then develop our model and hypotheses. The fourth section presents our methodology. The fifth section discusses the findings and their theoretical and practical implications. The final section presents the study's limitations and conclusions.

## **Background -- Information Systems Strategy Typology**

Even though individual firms and IS executives may differ in their perceptions, a strategy is a reflection of a collective view that is shared across the organization (Mintzberg, 1987). Mocker (2005) describes three ways to conceptualize IS strategy: (1) as the use of IS to support business strategy, (2) as the master plan of the IS function, and (3) as the shared view of the role of IS in the organization. In keeping with Mintzberg's (1987) view of strategy as a reflection of a collective view shared across an organization, Mocker suggests that the third conceptualization of IS strategy is most in line with definitions of strategy as shared perspectives of the organizational objectives. Adopting this view of strategy, Chen et al. develop a typology of three IS strategies: 1) IS Innovators, 2) IS Conservatives, and 3) IS Undefined.

The IS Innovator strives to be a leader in its industry in the development and use of IT to solve business problems and create value for the firm. Seeking to capitalize on innovative IS initiatives for its overall benefit, the IS Innovator devotes resources to technology exploration. Although the IS Innovator is heavily involved in exploring the potential of emerging technologies, this does not imply that the IS Innovator is necessarily the first one to adopt each new innovation. As such, the IS Innovator strategy does not imply that a firm is always an early adopter of technology. Instead, the IS Innovator's strategic perspective is to constantly be searching for ways to innovate with IS and to apply those IS innovations that appear to have the highest potential of giving the organization an advantage over the competition. The IS Innovator strategy is likely to be seen in firms where IS is not only enabling business strategy but driving business strategy.

The IS Conservative approaches IS strategy with less emphasis on exploring new technologies and more emphasis on exploiting existing solutions. Contrary to the IS Innovator, the IS Conservative does not desire to establish itself as an IS leader nor does it strive to be the first to develop new IS initiatives within its industry. The IS Conservative eschews the risks associated with innovation by carefully assessing the necessity of an IS innovation and observing the overall tendency of other organizations in its industry. Under certain circumstances, it is possible that an IS Conservative may be the first one to adopt and use a new IS innovative technology or practice; however, this is not the long-term perspective or approach of the IS Conservative. Rather, the IS Conservative's overall goal is to conform to a conservative approach in which innovation is more likely to entail local rather than industry innovation (Leidner, Preston, and Chen, 2010). As a result, the success of the IS Conservative strategy may be judged more by the efficiency of the IS department than by its' innovativeness.

The IS Undefined characterizes an IS strategy that is ill-defined or unclear. An organization with an IS Undefined strategy does not have long-term IS goals nor does it consistently follow a set pattern regarding its IS strategy. While it might at first appear implausible that any firm would have an undefined IS strategy, practice suggests otherwise: according to Slater (2002), 39 percent of U.S. companies have no IS strategy. Organizations with an IS Undefined strategy do not strategically utilize IS for either explorative (IS Innovator) or exploitative (IS Conservative) goals. Rather, these organizations are focused primarily on IS as an operation.

While Chen et al. (2010a) propose these three strategies, there is conceivably a fourth strategy involving ambidexterity -- both exploration (represented by the IS Innovator strategy) and exploitation (represented by the IS Conservative strategy). Indeed, scholars have suggested that IS should seek to be both explorative and exploitative (Galliers, 2006). While laudable in principle, organizational research has shown that most organizations are unable to be both highly innovative and highly efficient (Abernathy, 1978; Benner and Tushman 2003, Smith and Tushman, 2005). Thus, even while firms might seek to do both, it is likely that in practice, they are consistently better at one than the other. Consequently, Chen et al. argue that the IS strategy of a firm will be largely characterized by one of the three strategies represented in the typology.

Ultimately, the aim of any strategy is to guide an organization to achieve desirable performance results in its given business environment. Mintzberg (1987) proffered the five Ps of strategy: the plan -- an intentional course of action, the ploy -- the specific actions intended to outperform competitors, the pattern -- the sum of the ploys, the position -- the means of finding the right match between the organization and its external environment and the perspective -- the ingrained way of perceiving the organization and its objective. Collectively, these five Ps of strategy are useful only to the extent that they help an organization perform. Without satisfactory performance as an outcome, strategy and the process of strategizing risk becoming little more than superfluous exercises producing illusions of managerial effectiveness rather than desirable organizational outcomes. Thus, it is imperative that as we seek to better delineate IS strategies, we also develop an understanding of their impact on the organization. Most notably, we need to understand how IS strategies affect the contribution IS makes to organizational performance and to satisfaction with IS. The latter is important in that satisfaction with the performance contribution of IS can help ensure future funding for IS projects, can help ensure a stable CIO position, and can form the basis of strong relationships between IS and the business units (Leidner and Mackay, 2007). As such, we investigate in this study the following question: what is the relationship of IS strategy to IS contribution to firm performance and satisfaction with IS?

## **Research Model and Hypotheses**

To understand the impact of an IS strategy on IS performance and satisfaction, we draw upon the IS strategy typology explained above to develop a theory (depicted in Figure 1) of IS Strategy and Performance. The theory

comprises the three IS strategies, two dimensions of IS performance -- IS contribution to strategic growth and IS contribution to firm efficiency -- and two dimensions of satisfaction -- organizational satisfaction with IS and organizational satisfaction with the CIO.

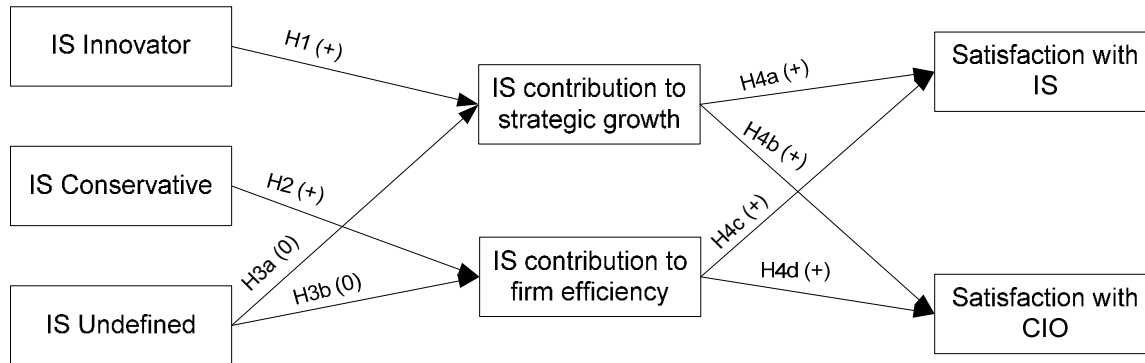


Figure 1. Research model

While IS performance can be conceptualized in various ways using manifold criteria (Saunders and Jones, 1992), research often distinguishes between two aspects of IS performance: (1) efficiency gains -- the degree to which IS enables an organization to reduce operational costs by substituting technology for labor or otherwise improving the productivity of workers, and (2) effectiveness gains -- the degree to which IS enables an organization to achieve growth and differentiation in its market (Melville, Kraemer, and Gurbaxani, 2004). Because an organization may have many IS capabilities that it does not, in fact, appropriate to its advantage, it is important to view IS performance in light of the contribution that IS makes to the organization both in terms of efficiency impacts and competitive impacts (Melville et al., 2004). Empirical studies of IS performance have looked at both first-order efficiency gains and second-order competitive gains. For example, Barua, Kriebel, and Mukhopadhyay (1995) tested a model of IS performance using such first order effects as inventory turnover (an efficiency measure) and such second order effects as market share. Likewise, Tallon, Kraemer, and Gurbaxani (2000) examined IS performance in terms of operational efficiency versus strategic positioning. And in a forthcoming paper, Chen, Preston and Xia (2010b) are able to empirically link certain attributes of CIO leadership to firm efficiency gains and other attributes of CIO leadership to strategic growth gains. Not only do attributes of the CIO influence performance outcomes, so too have attributes of the IS strategy been found to have influence organizational outcomes. Sabherwal and Chan (2001), for example, looked at the use of IS for efficiency, flexibility, or comprehensiveness and tied these IS attributes to attributes of a firm's strategic focus, including defensiveness, risk aversion, aggressiveness, proactiveness, analysis, futurity. And while the Sabherwal and Chan (2001) research makes significant head-way into linking IS strategy attributes to organizational strategies, the research stops well short of linking IS strategies themselves to performance. Our hypotheses will therefore bridge this gap and link the three IS strategies identified by Chen et al., (2010a) to IS contribution to firm efficiency and strategic growth.

Although performance is arguably the most important outcome of an effective IS strategy, one should also consider the impacts of the IS strategy on satisfaction with IS as well as satisfaction with the CIO. CIO leadership studies have shown that organizations that suffer from disappointing IS results -- most often from systems that are implemented late and over budget -- often become dissatisfied with IS and with their CIO. These organizations then tend to treat future IS investments with even greater skepticism than previously and tend to suffer high CIO turnover rates (Leidner and Mackay, 2007). Sometimes these organizations respond by giving very little decision making authority to the CIO which then tends to hinder any efforts of the CIO to target systems that might help an organization achieve competitive gains (Preston et al., 2008). Because lack of satisfaction with IS and/or with the CIO can have significant repercussions toward the ability of the CIO to deliver high-value solutions, it is imperative for CIOs to develop, and implement, IS strategies that enable them to deliver significant benefits to organizational performance. Our hypotheses will therefore also consider the relationship of IS strategy to satisfaction, both satisfaction with IS and satisfaction with the CIO.

### ***The Impact of Innovative IS Strategy on IS Contribution to Strategic Growth***

The degree to which a firm may benefit from an IS Innovator strategy will depend, in part, on the extent to which a firm is able to usher the necessary skills and resources to successfully mobilize IS innovations to its advantage. It is the organization's ability to take advantage of unique IS opportunities, rather than the characteristics of the technology per se, that enable the organization to achieve performance gains (Chen et al., 2010a; Galliers, 2004). Organizations that consistently pursue IS innovation as a strategy are more likely to have unique capabilities developed over time through experience or tinkering (Ciborra, 1992) with multifarious technologies that enable them to quickly assess the potential of emerging technologies to contribute to their business strategy. By continually pursuing IS innovation, the organization develops the knowledge, which enables the managerial capability to quickly move forward with IS innovation. This managerial IS capability becomes a source of competitive advantage over industry competitors (Li et al., 2006; Mata, Fuerst, and Barney, 1995). Thus, one way that the IS Innovator strategy may be tied to strategic growth is through the conferring of competitive advantage from unique IS management capabilities (Mata et al., Barney 1991, Clemons, 1986). And because the IS Innovator strategy represents a consistent approach to IS innovation, even as IS Conservatives eventually follow suit by implementing similar systems, the IS Innovator will always be a step ahead, looking for the next innovation. In this way, the IS Innovator is the preferred strategy for an organization desiring a sustained advantage from IS (Picolli and Ives, 2005).

A second way in which the IS Innovator strategy may be linked to strategic growth is through the enablement of business innovations that create performance gains. In this case, the growth occurs not from the IS innovation per se, but from the business innovations that the IS innovations enable. Similar to the platform organizational model proposed by Agarwal and Sambamurthy (2002), IT provides the assets and resources for business innovations across the organization. For instance, eBay, with its Internet auctions, had superior insight into how IT would fundamentally change an industry. This insight allowed it to stake out commanding positions within its industry (Carr, 2003). Innovative business strategies are often associated with firms that desire to gain competitive advantage and achieve performance goals (Walker, 2006; Walker, Damanpour, and Avellaneda, 2007). The adoption of business process innovations, which can be enabled by IS innovations, is a route to higher levels of organizational performance (Walker et al., 2007). In these firms, one expects to find an organizational culture that encourages risk-taking and exploration not just for the organization as a whole, but in the various business units as well. As a business unit that typically accounts for a large percent of the total capital expenditures of a firm, the IS department, if properly aligned with the business, would also be pursuing innovations that support the business innovations.

Thus, whether through the conference of competitive advantage through the development of unique IS capabilities or through the enablement of business innovations that grow opportunities, the IS Innovator strategy is predicted to be related positively to performance. Stated formally, we hypothesize:

H1: The IS Innovator strategy will be positively related to IS contribution to strategic growth.

### ***The Impact of Conservative IS Strategy on IS Contribution to Firm Efficiency***

Conservative IS strategy focuses on maintaining stability and exploiting existing IS resources. Because conservatives are not seeking to be the first in their industry to try an innovation, it is unlikely that they will be able to gain short-term competitive advantage from a new system implementation. However, IS Conservatives do often benefit from being late majority adopters of technology (Rogers, 1962). Because the tendency of IS Conservatives is to wait for a technology to be proven efficient before they invest in it, they benefit from investing in established technology since waiting is likely to reduce the risk of investing in something that is technologically flawed or doomed to rapid obsolescence (Carr, 2003). IS Conservatives reap the benefits from vanilla solutions, less customization and standardized applications. Among the major benefits is that once solutions have become commonplace in an industry, they are often less expensive. The costs of acquiring solutions from the market are therefore less for the IS Conservative than the IS Innovator. Moreover, IS Conservatives can learn from the successes and failures of IS Innovators, implementing the best practices of the industry without incurring the costs of discovering the best practices. Thus, the overall costs of implementing IS should be less for the IS Conservative than for the IS Innovator.

While the IS Conservative strategy is not as glamorous as the IS Innovator, it is by no means inferior in terms of its potential impacts on firm performance. The IS Conservative strategy is tied to performance by (1) enabling an efficient, low-cost (relative to competitors) IS operation that continuously looks for ways to cut costs out of the delivery of IS systems and services and by (2) helping the organization itself create efficiency gains through the implementation of proven systems that enable an organization to achieve business efficiencies with IS solutions. Given the focus on exploiting technologies to reduce costs, it is expected that IS Conservatives will regularly revisit their infrastructure and look for ways to cut costs from the IS infrastructure without decreasing service levels.

For IS Conservatives to succeed, they must carefully monitor the IS Innovators in their industry and maintain awareness of technology developments. Due to its exploitative rather than explorative nature, the IS Conservative strategy is better served by formalized planning approaches (Philip, 2007). Prior research suggests that formalized planning processes, while often considered a bane for innovation, are advantageous for achieving gains in efficiency and control for an organization (Dawes, Lee, and Dowling, 1999). Thus, while we do not expect the IS Conservative strategy to be linked to strategic growth, we do expect that the strategy contributes to firm performance by improving firm efficiency. Stated formally,

H2: The IS Conservative strategy will be positively related to IS contribution to firm efficiency.

### ***The Impact of Undefined IS Strategy on IS Contribution to Strategic Growth and Firm Efficiency***

An Undefined IS strategy is unclear and lacks order. An organization that does not have a well defined strategy is not equipped with either explorative (innovative) or exploitative (conservative) goals for IS (Chen et al., 2010a). Any observable pattern in IS expenditure is random rather than volitional. Although lacking foresight, it is possible that fortuitous circumstances create a situation where an IS Undefined is able to achieve major performance gains from IT. Indeed, much of the early case studies on IS for competitive advantage highlighted organizations whose desperate attempt to solve a local operational problem resulted in a system that changed, in some cases redefined almost entirely, competition in an industry. For example, the Sabre system, initially developed to help American Airlines improve the way in which it managed reservations and allocated capacity, radically altered the nature of competition in the airline industry, even contributing to the bankruptcy of several airlines that could not compete quickly enough (Copeland and McKenney, 1988). However, while such serendipitous competitive advantages may be created through IS without intent, there are inherent risks in being an IS Undefined that render it highly problematic to expect a consistent relationship of IS Undefined to firm performance.

Because there is no strategy, firms that are IS Undefined do not, or cannot, consider the necessary human and technology resources needed to effectuate their IS strategy. Thus, when an opportunity does arise to apply a new IS solution, firms may find themselves without the necessary skills or knowledge to apply the solution effectively or to even understand the potential of the IS. Without the requisite knowledge and skills, IS Undefined organizations will be unable to capitalize on IS investments (Galliers, 2004). An ill-defined IS strategy is also likely to create chaos and uncertainty within the organization. Business units will not know what to expect of IS given that there does not appear to be a consistent pattern of IS investment. In such organizations, CIOs will then be challenged to nurture relationships with business units that lack understanding and appreciation for the potential of IS. It will be almost impossible to establish alignment with the business absent the shared understanding between the business units and IS (Reich and Benbasat, 1996) and without the alignment, it is not likely that the firm will experience performance gains from IS (Chan et al., 1997). We thus hypothesize:

H3a: The IS Undefined strategy will be unrelated to IS contribution to strategic growth.

H3b: The IS Undefined strategy will be unrelated to IS contribution to firm efficiency.

### ***The Impact of IS Performance on IS Satisfaction***

A key aspect to evaluating the performance of a product or service is the feedback that a provider receives from consumers. The feedback on IS performance from an organization's perspective is no exception. When the organization expresses satisfaction with the IS department and the CIO, it provides reinforcement to the department

and CIO that they are performing well. This reinforcement should, in turn, motivate the IS department and CIO to sustain or to further improve the momentum of their current performance levels so that they uphold a cycle of continued success. For instance, according to Conrath and Mignen (1990), the primary reason IS departments measure satisfaction is to improve the quality of their services. It is also possible, of course, that temporary success may provide leeway for the IS department and CIO to relax their efforts, but given the challenges of building rapport with business units and senior managers, it is more likely that the CIO and IS department will build upon, rather than rest upon, hard-earned satisfaction. The principal idea is that feedback regarding satisfaction is an important component in a research model involving IS performance. As such, we assess the impact of IS performance on both the organization's satisfaction with the IS department and the CIO.

Although satisfaction does not imply success, it is often a reflection of success. High IS performance should translate into increased organizational satisfaction with IS. In general, when an entity delivers quality outcomes, people are more satisfied than when an entity delivers poor quality outcomes. Watson, Pitt, Cunningham, and Nel (1993) even argue that the measure of the service quality delivered by an IS department can be used as a surrogate for user satisfaction. This means that the higher the service quality, the higher the satisfaction level among users. In a similar sense, high IS performance should also increase satisfaction among organizational members. In order for the IS department to be able to contribute to the firm's strategic growth and efficiency, it is likely that the department not only delivers quality services, but also supports the firm's business strategy. It is this level of contribution to the firm's performance that stimulates the organization's satisfaction with IS. In general, when a group performs well, its leader is usually given special credit or recognition above what the other members receive. Similarly, the CIO -- the highest ranking IS executive -- is likely to be given special credit for the performance of his or her department. Thus, when the organization is satisfied with the performance of the IS department, they also are likely to be satisfied with the performance of the CIO. We therefore hypothesize:

H4a: IS contribution to strategic growth will be positively related to organizational satisfaction with the IS department.

H4b: IS contribution to strategic growth will be positively related to organizational satisfaction with the CIO.

H4c: IS contribution to firm efficiency will be positively related to organizational satisfaction with the IS department.

H4d: IS contribution to firm efficiency will be positively related to organizational satisfaction with the CIO.

## **Method**

Data for the current study was collected via an online questionnaire in late 2009 by Cutter Consortium, an Information Technology advisory firm. A total of 45 valid responses resulted from the data collection effort. Respondents were primarily composed of senior level business executives who were involved in their organizations' IS strategic planning. Due to their involvement in IS strategic planning, these senior executives were the most appropriate persons to answer the questionnaire, which is in line with prior research (e.g. Chatterjee, Grewal, and Sambamurthy, 2002). Ten (22%) of the 45 respondents categorized themselves as the highest ranking IS executive within their organizations. The sizes of the organizations in the sample were wide-ranging and ranged from less than 10 employees to more than 100,000 employees, with an average employee count of between 51 and 100. Annual sales revenues ranged from less than \$1 million to more than \$50 billion. While almost a quarter of the organizations are in the financial services sector (24.4%), other sectors represented in the sample include computer software publishing (17.8%), non-military government (15.6%), and computer consulting (11.1%), among others. In addition, over half of the firms were headquartered in North America (55.6%). Table 1 provides summary descriptions of the organizations in the sample.

**Table 1: Descriptive summary of organizations**



Industry	% of Sample
Financial Services	24.4%
Computer Software Publisher	17.8%
Government (non-military)	15.6%
Computer Consulting	11.1%
Computer Hardware Manufacturer	4.4%
Management Consulting/Accounting	4.4%
Other	22.3%

Annual Revenue (USD)	% of Sample
Less than 1 million	15.6%
1 million to 10 million	22.2%
10 million to 50 million	11.1%
50 million to 100 million	2.2%
100 million to 1 billion	15.6%
1 billion to 10 billion	15.6%
10 billion to 50 billion	6.7%
More than 50 billion	11.1%

Headquarters	% of Sample
North America	55.6%
Australia / Pacific	15.6%
Europe	8.9%
Asia	6.7%
India	6.7%
South America	4.4%

## Measures

The majority of the measures for this study were adopted directly from extant literature, although some items were developed where prior validated measures were not available. All constructs were measured using multiple-item scales and are listed in the Appendix.

### IS Strategies

Three IS strategies are represented in our current research model. An *IS Innovator* strategy is defined as an organizational view that continuously aspires to be innovative through new IS initiatives, i.e. this strategy seeks to *explore* new, uncertain alternatives. An *IS Conservative* strategy, on the other hand, represents an organizational perspective that strives to create value through effectively refining and improving existing IS practices, i.e. this strategy seeks to *exploit* existing organizational resources. Additionally, an *IS Undefined* strategy does not have an articulated approach toward either the explorative or exploitative use of IS. The IS strategy definitions and measurement items were adopted from Chen et al. (2010a). Respondents were asked to evaluate their organization's general, long-term IT strategy. Measurement items used a 5-point Likert-type response scale ranging from "strongly disagree" to "strongly agree".

### IS Contribution

Chen et al. (2010b) distinguish between two types of contributions to the IS function at the organizational level. *IS contribution to strategic growth* refers to IT's impact on the organization's strategic positioning, including its influence on the firm's return on investment, sales revenue increase, and market share growth. Alternatively, *IS contribution to firm efficiency* refers to IT's impact on the organization's operational effectiveness, including its influence on cost savings, operating efficiency, and process improvement. Items for the two IS contribution constructs were adopted from Chen et al. (2010b). Respondents were asked to assess the extent to which IT had contributed to each of the measurement items (see Appendix) in their organizations. Responses were captured using a 5-point Likert-type scale ranging from "no extent" to "very great extent".

### Satisfaction

Finally, measures for satisfaction with IS and satisfaction with the CIO were developed for this study. Satisfaction with IS measures the respondents' satisfaction with the strategic direction and performance of IT for the years 2007, 2008, and 2009, while satisfaction with the CIO measures respondents' satisfaction with the CIO's performance during the same time period. The two satisfaction constructs used a 5-point Likert-type response scale ranging from "very dissatisfied" to "very satisfied".

## Data Analysis and Results

First, since respondents could have inadvertently rated their organization as high on all three IS strategies, we performed an assessment of the responses to the IS strategies to ensure reasonable data quality. A correlation analysis revealed no significant relationship between responses to IS Innovator and responses to IS Conservative ( $r = -0.080$ ,  $p = 0.600$ ) and no relationship between responses to IS Conservative and responses to IS Undefined ( $r = -0.163$ ,  $p = 0.285$ ). This suggests that firms tended to be categorized as distinctly one of IS Innovator or IS Conservative and as IS Conservative or IS Undefined. A moderately negative correlation was found between responses to IS Innovator and responses to IS Undefined ( $r = -0.567$ ,  $p = 0.000$ ); however, this only indicates that firms that are high as IS Innovators are relatively low as IS Undefined. This is appropriate since IS Innovators tend to have definite strategies and are thus low on undefined strategies. Moreover, collinearity statistics were well within appropriate ranges (Hair, Black, Babin, Anderson, and Tatham, 2006): variance inflation factor (VIF) statistics were less than 1.58 and tolerance values were above 0.64. Second, since 10 of the 45 respondents categorized themselves as the highest ranking IT executive, we took care to assess whether their responses to the satisfaction items were significantly different from those of the other 35 respondents. This was done to ensure that there is no potential bias between responses from those who may have rated satisfaction with themselves and those who rated satisfaction with someone other than themselves. Indeed, F-tests revealed no significant differences in answers ( $F=0.622$ ,  $p=0.434$  for satisfaction with IS; and  $F=1.905$ ,  $p=0.175$  for satisfaction with CIO).

Next, due to the small sample size, SmartPLS (Ringle, Wende, & Will, 2005) was used to analyze the research model. The analysis followed the approach outlined by Chin (1998). Results of the measurement model indicate that satisfactory reliability and validity were achieved (composite reliability,  $CR > .70$ ; average variance extracted,  $AVE > .50$ ); see Table 2. Results also suggest satisfactory discriminant validity: the square root of the AVE for each factor is greater than the correlations with other factors (Table 2), and the cross-loadings show each item loading higher on its own factor than on other factors (Table 3). One item measuring the IS Conservative strategy was dropped due to having a loading of less than .70.

**Table 2. Psychometric measurement validation and construct correlations**

	AVE	CR	Satisfaction with CIO	IS Conservative	IS Innovator	IS Undefined	IS contribution to firm efficiency	IS contribution to strategic growth	Satisfaction with IS
Satisfaction with CIO	0.8569	0.9472	0.9257						
IS Conservative	0.7903	0.8828	0.2493	0.8890					
IS Innovator	0.7607	0.9049	0.5087	-0.0634	0.8722				
IS Undefined	0.8161	0.9300	-0.5918	-0.1499	-0.5488	0.9034			
IS contribution to firm efficiency	0.7761	0.9123	0.6088	0.3145	0.3137	-0.5361	0.8810		
IS contribution to strategic growth	0.7643	0.9065	0.3990	0.0708	0.6523	-0.5015	0.4258	0.8742	
Satisfaction with IS	0.6416	0.9145	0.7691	0.3155	0.4980	-0.5890	0.6468	0.5396	0.8010

Note: The diagonals are the square roots of the average variance extracted (AVE) for each factor.

**Table 3. Loadings and cross loadings**

	Satisfaction with CIO	IS Conservative	IS Innovator	IS Undefined	IS contribution to firm efficiency	IS contribution to strategic growth	Satisfaction with IS
CIOsat07	0.9262	0.3301	0.3723	-0.5318	0.5558	0.3466	0.6773
CIOsat08	0.9509	0.2661	0.4409	-0.5248	0.5665	0.2995	0.7206
CIOsat09	0.8992	0.1083	0.5852	-0.5805	0.5658	0.4506	0.7330
ISconservative_1	0.2715	0.9176	-0.1070	-0.1342	0.3108	-0.0408	0.3124
ISconservative_3	0.1593	0.8595	0.0083	-0.1331	0.2417	0.1970	0.2418
ISinnovator_1	0.4205	-0.0232	0.8921	-0.5151	0.2758	0.6092	0.3909
ISinnovator_2	0.4110	-0.0042	0.9085	-0.4154	0.2811	0.6404	0.4510
ISinnovator_3	0.5406	-0.1822	0.8129	-0.5364	0.2669	0.4169	0.4851
ISundefined_1	-0.5269	-0.0187	-0.5921	0.8584	-0.4110	-0.4194	-0.3825
ISundefined_2	-0.4450	-0.2365	-0.3738	0.9261	-0.4691	-0.4819	-0.5769
ISundefined_3	-0.6274	-0.1369	-0.5338	0.9240	-0.5609	-0.4561	-0.6151
ISContribEfficiency_1	0.4809	0.1932	0.2777	-0.5129	0.8623	0.4638	0.4874
ISContribEfficiency_2	0.5500	0.3848	0.2104	-0.4760	0.8985	0.2957	0.5287
ISContribEfficiency_3	0.5718	0.2463	0.3390	-0.4346	0.8818	0.3757	0.6811
ISContribGrowth_1	0.3012	0.0528	0.4476	-0.3975	0.3815	0.8414	0.3563
ISContribGrowth_2	0.3728	0.0519	0.5986	-0.4821	0.3800	0.9395	0.5229
ISContribGrowth_3	0.3630	0.0794	0.6384	-0.4279	0.3593	0.8379	0.5106
ISSatDirection07	0.5786	0.1633	0.2773	-0.3730	0.3145	0.2448	0.7032
ISSatDirection08	0.6283	0.2471	0.3145	-0.4830	0.4430	0.3869	0.7673
ISSatDirection09	0.6137	0.1996	0.5100	-0.5994	0.5501	0.4970	0.8514
ISSatPerf07	0.6526	0.3599	0.3458	-0.3826	0.4885	0.3606	0.7953
ISSatPerf08	0.6632	0.3438	0.4324	-0.4496	0.5388	0.5084	0.8645
ISSatPerf09	0.5889	0.2003	0.4460	-0.5050	0.6681	0.5015	0.8133

The standard bootstrap resampling procedure was used to test the significance of the structural research model in SmartPLS. Figure 2 illustrates the model results from the analysis, with explanatory powers ( $R^2$ ) and standardized path coefficients ( $\beta$ ).

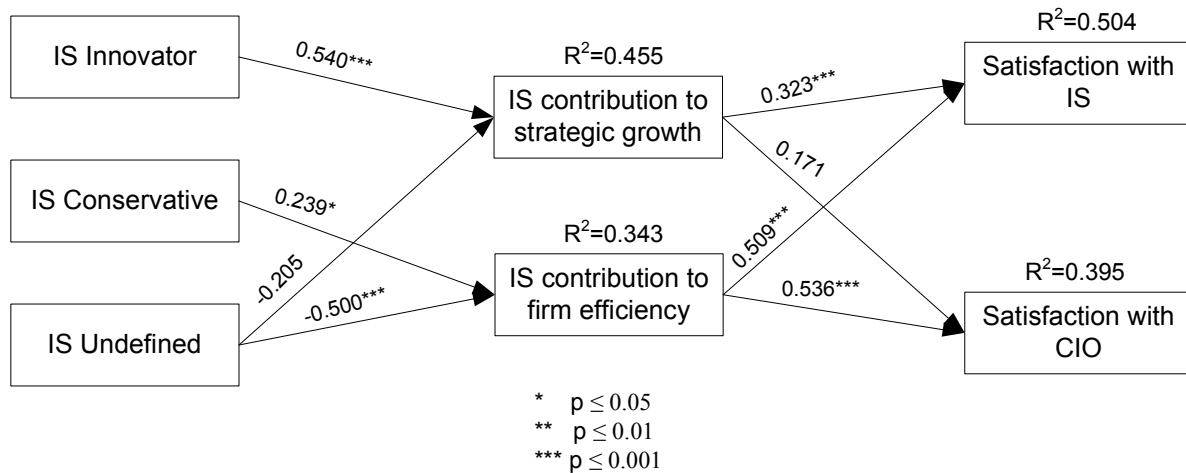


Figure 2. Model results

The results show that 6 of the 8 hypotheses were supported. Instead of finding no significant relationship between IS Undefined and IS contribution to firm efficiency as hypothesized in H3b, the relationship was found to be significantly negative. The IS Innovator and IS Undefined strategies explained 45.5% of the variance in IS contribution to strategic growth, while the IS Conservative and IS Undefined strategies explained 34.3% of the

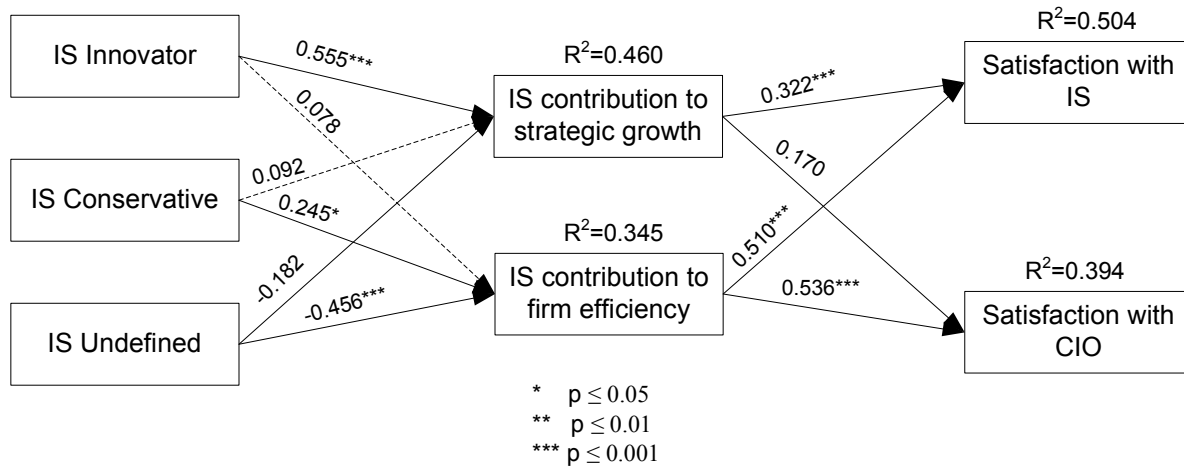
variance in IS contribution to firm efficiency. In turn, the IS contributions to strategic growth and firm efficiency explained 50.4% and 39.5% of the variances in satisfaction with IS and satisfaction with CIO, respectively. Table 4 summarizes the results of our hypotheses.

**Table 4. Summary of results**

Hypothesis	Result
H1: The IS Innovator strategy will be positively related to IS contribution to strategic growth.	Supported
H2: The IS Conservative strategy will be positively related to IS contribution to firm efficiency.	Supported
H3a: The IS Undefined strategy will be unrelated to IS contribution to strategic growth.	Supported
H3b: The IS Undefined strategy will be unrelated to IS contribution to firm efficiency.	Not supported
H4a: IS contribution to strategic growth will be positively related to organizational satisfaction with the IS department.	Supported
H4b: IS contribution to strategic growth will be positively related to organizational satisfaction with the CIO.	Not supported
H4c: IS contribution to firm efficiency will be positively related to organizational satisfaction with the IS department.	Supported
H4d: IS contribution to firm efficiency will be positively related to organizational satisfaction with the CIO.	Supported

**Post-Hoc Analysis**

A post-hoc analysis was conducted to examine two additional relationships which were not hypothesized in our research model. First, we wished to verify that IS Innovator was not significantly related to IS contribution to firm efficiency. Indeed, the relationship was non-significant ( $\beta = 0.078$ ,  $p$ -value= 0.29). Second, we wanted to verify that IS Conservative was not significantly related to IS contribution to strategic growth. Again, the relationship was non-significant ( $\beta = 0.092$ ,  $p$ -value= 0.29). Results of the post-hoc analysis are exhibited in Figure 3.



-- dotted lines indicate relationships that were not hypothesized

**Figure 3. Post-hoc analysis results**

Due to our conceptualization of the IS strategies (essentially that organizations tend to follow one strategy at a time), we wished to verify that the relationships in the proposed model remain the same when only one IS strategy is in the model at a time. The significance of all relationships remained the same except that the relationship between IS Undefined and IS contribution to strategic growth became significant. However, this is not surprising because this relationship was just shy of the .05 significance level in the proposed model ( $p = 0.063$ ), and the relationship between IS Undefined and IS contribution to firm efficiency was also already significantly negative. This suggests there is appropriate congruence between our conceptualization and empirical implementation of the IS strategies.

## **Discussion**

Given the important impact that an IS strategy has on the potential value IS brings to an organization and the nebulous understanding of the concept of IS strategy, Chen et al. (2010a) provide a reconceptualization and operationalization of IS strategy. In this paper, we have built on Chen et al.'s work and are the first to empirically test their new typology of IS strategy and to incorporate their typology into a model of IS Strategy and Performance. We found that an IS Innovator strategy was positively related to performance in terms of IS contribution to strategic growth. On the other hand, the IS Conservative strategy was found to be positively related to performance in terms of IS contribution to firm efficiency. However, IS Innovator was not significantly related to IS contribution to firm efficiency nor was IS Conservative significantly related to IS contribution to strategic growth, as can be seen in the post-hoc analysis results.

In contrast to the IS Innovator and IS Conservative strategies, the IS Undefined strategy can have a negative impact on IS contribution to firm performance: our results show that IS Undefined has a strong negative relationship with IS contribution to firm efficiency ( $\beta = -0.500$ ,  $p = 0.000$ ). Furthermore, although not significant at the .05 significance criteria, IS Undefined is potentially disadvantageous to IS contribution to strategic growth as well, with a significance value just shy of the .05 criteria ( $\beta = -0.205$ ,  $p = 0.063$ ). Perhaps this weak relationship of IS Undefined to IS contribution to strategic growth is due to the random fortuitous circumstances that may still come about even without a defined strategy.

Our results also shed light on the relationship of IS contribution to performance and satisfaction with IS and with the CIO. IS contribution to strategic growth is associated with satisfaction with the IS department, but not with the CIO. In contrast, IS contribution to firm efficiency is associated with both satisfaction with the IS department and satisfaction with the CIO. This indicates that CIOs overseeing IS Innovator strategies either work in organizations with higher expectations of their performance than do CIOs overseeing the IS Conservative strategy or that perhaps they are not duly credited for their contribution.

## **Implications and Future Research**

Our analysis demonstrates that having a defined IS strategy (e.g. the IS Innovator or IS Conservative), as opposed to not having a defined strategy (e.g., the IS Undefined), has positive impacts on IS performance through IS contribution to strategic growth or firm efficiency. Given the importance of having a defined IS strategy, one might wonder why any firm might have an undefined IS strategy. We suggest several explanations. Organizations that pursue an IS Innovator strategy but are unable to derive advantages relative to competitors are unlikely to continue very long with this strategy and may well find themselves in a state of turmoil if they are unable to devote the resources and managerial skills necessary to support the IS Innovator strategy. The IS Innovator carries a risk of failure which can create backlash for the IS department and the CIO (Leidner and Mackay, 2007). Thus, one possibility is that firms that attempt an IS Innovator strategy, and fail, find themselves temporarily at least in a state of IS Undefined. It is also possible that firms with relatively recent CIO appointments are also in a state of strategic uncertainty until the CIO has had time to address the most pressing of problems facing the IS department. Firms that have experienced consistently poor performing IS operations or Big Bang failures frequently respond by bringing in a new CIO to implement radical change (Leidner and Mackay, 2008). Strategy might be the very last thing on the CIO's mind as he/she struggles to bring operations to a satisfactory level and improve the morale of IS personnel. Only after the CIO has been able to provide solutions to the operational and personnel problems, as well as establish relationships with business units, can he/she focus on the strategic aspect (Leidner and Mackay, 2007).

Other possible explanations for the lack of a defined IS strategy include mergers and acquisitions (Robbins and Sylianou, 1999), which often leave IS departments facing an operational chaos as they strive to consolidate systems, and inadequate decision making authority, or ability, on the part of the CIO (Preston et al., 2008). Moreover, some organizations might not have well defined organizational strategy, making it all the more likely that a firm's IS strategy will also be ill-defined. In such cases, it might be difficult if not impossible for the CIO to spearhead an IS strategy because the IS strategy, by nature, must take into account the organizational strategy. Some evidence of this was provided in the interviews reported by Leidner and Mackay (2007) in which a CIO new to his position quickly discovered that the organization itself had such an ill-defined strategy that he was unable to craft an IS strategy until he had convinced the CEO of the need for a more clearly defined organizational strategy. Finally, the external environment, notably the economy, might explain some of the occurrence of IS Undefined. Perhaps during the weak economy, firms are in such a state of uncertainty about their future that they have abandoned existing IS

strategies, or essentially put them on hold (Leidner, Beatty and Mackay, 2003) and are in a “wait and see” mode. Ironically though, the data suggest that this is possibly the worst approach to take during the recession.

Future research could examine these, and other, explanations for the presence of IS Undefined strategies in organizations as well as examine the consequences of being IS Undefined for short versus long periods of time. Practice-oriented research could focus on research that helps us understand the steps CIOs can take to ensure successful development of, and effectuation of, IS strategies.

All hypothesized relationships between the two measures of IS contribution to firm performance and the two measures of satisfaction were significant, except one -- the relationship between IS contribution to strategic growth and satisfaction with the CIO. It is interesting that while CIOs appear to be credited when IS contributes to firm efficiency (as signified by the positive relationship between IS contribution to firm efficiency and satisfaction with the CIO), they do not appear to be credited when IS contributes to the firm’s strategic growth. Several explanations are possible for this insignificant finding. Perhaps it is more difficult to associate contribution to strategic growth with the CIO since the CIO has traditionally played a supply-side leadership role that focuses on exploiting existing IS competencies rather than exploring new IS-enabled opportunities (Chen et al., 2010b). Thus, while the organization is satisfied with the CIO when IS contributes to firm efficiency, it may not attribute satisfaction to the CIO when IS contributes to the firm’s strategic growth. Another reason why contribution to strategic growth is not associated with satisfaction with the CIO may be that there is a lag between the actions the CIO takes to explore new opportunities and the actual IS contribution to the firm’s strategic growth. Since it has been widely accepted that exploitation allows current viability while exploration ensures future viability (Chen et al., 2010b), IS contribution to firm efficiency (e.g. from exploitation) is associated with satisfaction with the CIO because there is little lag between the CIO’s action and the resulting efficiency gains. Perhaps by the time IS contributes to strategic growth, the CIO is no longer looked upon as the one who made it happen and therefore his or her satisfaction rating may not be related to the resulting strategic growth. A third explanation for the lack of a relationship between IS contribution to firm performance and satisfaction with the CIO might be that the CIO’s role in innovation for strategic growth is in fact subservient to other high-level executives. In such a case, CIOs are nevertheless encouraged to continue the course of their IS strategy given the strong contribution it is making to firm performance but also to highlight their role in IS based innovations during executive or board-level meetings.

Future research is needed to better understand the relationship between IS performance and satisfaction with IS and the CIO. Our findings suggest that even while both the IS Innovator and IS Conservative strategies created performance benefits for the firm, only the IS Conservative is associated with both satisfaction with IS and satisfaction with the CIO. This creates a dilemma then for CIOs who support IS Innovator strategies: the IS Innovator strategy is riskier than the IS Conservative and while the organizational benefits are evident, the personal rewards are less so. Future research can dig more deeply into this phenomenon, seeking to better understand why high-performing CIOs (e.g., CIOs who oversee a strategy that creates strategic growth for the firm) are not fully appreciated or credited. Practice-oriented research might look for ways that CIOs can make their own roles and strategic contributions more visible.

Given that the IS Innovator and IS Conservative strategies offer different benefits toward firm performance, one might wonder why firms do not attempt to combine these strategies. Indeed, there have been calls for greater ambidexterity in IS strategies (Galliers, 2007). Our factor analysis and correlation analysis on the three strategy types do suggest that firms tend toward one or the other strategy, but not both. Future research can explore the ways to make IS departments capable of both. The penchant to explore new technologies and the investments required to be successful at the IS Innovator run counter to the tendency to choose standardized solutions and tighter spending of the IS Conservative. Thus, it might be very difficult to be good at both strategies. However, future research could investigate if there is some middle ground strategy capable of delivering both strategic growth and firm efficiencies.

Lastly, this study focused primarily on the impact of IS strategies on contribution to firm performance. However, other factors might moderate or mediate this relationship. One aspect that is particularly notable is the concept of IS/business alignment maturity (Luftman, Dorociak, Kempaiah, and Rigoni, 2008; Luftman and Kempaiah, 2007), or the degree of interaction of management practices and strategic IT choices which an organization makes (Sledgianowski, Luftman, and Reilly, 2004). Luftman and colleagues have shown the positive relationship between alignment maturity and firm performance. Perhaps alignment maturity moderates the relationship between IS strategy and IS contribution to firm performance such that the more aligned IS is with the business, the more

positive the influence IS strategy will have on contributing to firm performance. Future research might address this impact using Luftman's components for assessing alignment maturity (Luftman and Kempaiah, 2007).

## **Limitations and Conclusion**

This paper was motivated by an interest in investigating the impacts of IS strategies on IS performance and satisfaction. Several limitations warrant mention. First, the cross-sectional design of the study does not permit us to establish causality. In fact, one might argue that it is the failure to perform that creates situations of IS Undefined strategies or that it is the very lack of satisfaction with IS and with the CIO that creates situations of ill-defined IS strategies. Indeed, the relationships might be circular. Theoretically, it would be difficult to posit that performance leads to strategy per se, although performance certainly would reinforce the strategy and provide impetus to continue with the given strategy (IS Innovator or IS Conservative). Second, the sample size is small and US-based. It is possible that a larger, more international sample might yield different results. The model presented in this paper should be retested using a larger sample from firms of different sizes across different industries. Third, the data was collected during a notably poor performing economy. It is possible that the overall organizational mood is one of dissatisfaction and that some relationships that are negative during a poor performing economy are positive, or at least not significantly negative, during a good economy. Indeed, perhaps it is less problematic to have no IS strategy during a good economy, when the general organizational growth and stability might suffice to reap benefits from IS, than during a weak economy. Fourth, the model presented direct relationships between IS Strategy and IS Contribution to Firm performance as well as direct relationships between IS Contribution to Firm Performance and Satisfaction with the CIO/IS department. It might be that there are indirect effects as well, such that IS Contribution to Firm Performance is related to Satisfaction through its impact on intangible factors such as cultural fit with the business units or such that IS Strategy is related to IS Contribution to Firm Performance through its effect on process improvements. Future work can consider the indirect and intangible relationships among the variables in our model. Fifth, our measure of IS Contribution to Firm Performance relies on respondents' assessments. Analyzing actual performance data might shed additional light on the relationships. Lastly, our data identified which of 3 IS strategies a firm employed, but did not gather information on the extent to which the firms had selected an appropriate IS strategy for their context nor the extent to which the firm effectively carried out the strategy. Future work might consider not only what strategy a firm has, but how well the firm executes the IS strategy and how well the IS strategy fits the organizational environment. A firm might have an IS Innovator or Conservative strategy but might not have the governance mechanisms, resources, partnerships, or metrics in place to effectively achieve the strategy. Thus, future work might also consider the contingencies that are necessary to effectively execute an IS strategy.

Notwithstanding these limitations, our study provides strong evidence that firms with defined IS strategies perform better than those without defined IS strategies. Our study also provides evidence that the two IS defined strategies contribute in very different ways to firm performance. Organizational leaders need to carefully consider what they want to achieve with IS and plan their IS strategy accordingly: firms that want to pursue growth strategies will do well to adopt the IS Innovator strategy whereas firms that desire to compete based on price will more likely benefit from the IS Conservative strategy. Lastly, firms with no IS strategy should realize the negative outcomes of such a lack of strategy and work to extricate themselves before a consistent pattern of investing in IS without clear organizational benefit develops.

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**Appendix**

Construct	Items	Source
IS strategy: IS Innovator	Our organization is a leading IS innovator in our industry.	Chen, Martin, Preston, & Teubner (forthcoming)
	Our organization believes in being first in the industry in developing new IS initiatives even if not all of these efforts prove to be highly profitable.	
	Our organization responds rapidly to early signals concerning areas of opportunity for IS.	
IS strategy: IS Conservative	Our organization follows a safe and stable approach to developing new IS initiatives.	
	Our organization adopts promising IS innovations once these initiatives have been proven in our industry. [ <i>dropped</i> ]	
IS strategy: IS Undefined	IS innovations are carefully examined before they are chosen by our organization.	
	Our organization does not have definitive long-term IS goals.	
	Our organization does not have an articulated IS strategy.	
IS contribution to strategic growth	Our organization does not have a consistent pattern of behavior regarding IS.	
	Return on investment (ROI)	
	Sales revenue increase	
IS contribution to firm efficiency	Market share increase	
	Cost savings	
	Operating efficiency	
Satisfaction with IS	Process improvement	Developed for this study
	The organization's IT strategic direction in 2007	
	The organization's IT strategic direction in 2008	
	The organization's IT strategic direction in 2009 so far	
	The organization's overall IT performance in 2007	
	The organization's overall IT performance in 2008	
Satisfaction with CIO	The organization's overall IT performance in 2009 so far	
	The CIO's work performance in 2007	
	The CIO's work performance in 2008	
	The CIO's work performance in 2009 so far	