

Alignment Between Business and IS Strategies: A Study of Prospectors, Analyzers, and Defenders

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Alignment between business strategy and IS strategy is widely believed to improve business performance. This paper examines the impact of alignment on perceived business performance using Miles and Snow's popular classification of Defender, Analyzer, and Prospector business strategies. A priori theoretical profiles for these business strategies are developed using Venkatraman's (1989a) measure of business strategy. Theoretical profiles for IS strategies are developed in terms of four types of systems—operational support systems, market information systems, strategic decision-support systems, and interorganizational systems. Empirical data from two multirespondent surveys of 164 and 62 companies, respectively, are analyzed. Results indicate that alignment affects perceived business performance but only in some organizations. Alignment seems to influence overall business success in Prospectors and Analyzers but not in Defenders. Implications for future research and practice are discussed. (*Alignment; Information Systems Strategy; Strategy Profiles; Defenders, Analyzers, Prospectors; Profile Deviation Approach; Strategic Information Systems Management*)

1. Introduction

The impact of information systems and technology on business performance has increased noticeably during the last decade. Numerous surveys have highlighted Chief Information Officers' (CIO) concerns with IS strategic alignment (e.g., Niederman et al. 1991, SIM 1996). Researchers in the area of information systems (IS) have responded by examining the necessity and benefits of aligning IS with the rest of the business (Camillus and Lederer 1985, Chan et al. 1997, Gilbert 1995, Henderson and Venkatraman 1992, King and Teo 1997, Lederer and Mendelow 1989, Luftman et al. 1999, Reich and Benbasat 1996, Sambamurthy and Zmud 1999, Segars and Grover 1998). However, despite the intuitive appeal of the argument for aligning IS strategy with business strategy, empirical research on the

performance implications of this alignment has been sparse and fragmented.

This paper seeks to contribute to the literature on strategic IS management by pursuing three specific goals. First, it seeks to provide further insights into the performance implications of the alignment between business and IS strategies. It aims to do so in the light of prior theory on business and IS strategies, especially focusing on the Miles and Snow's (1978) well-established typology of business strategy, including Defenders, Analyzers, and Prospectors. Second, it examines the performance implications of alignment separately for these strategy types to assess whether alignment affects performance for all strategies or only for some of them. Finally, in doing so, the paper also seeks to provide further insights into the IS strategies appropriate for these three business strategies.

Thus, in viewing alignment and its performance implications, this paper employs a theory-driven approach, which incorporates prior knowledge and is therefore able to contribute to the cumulative stream of research in this area. The paper builds on Miles and Snow's (1978) typology of Defenders, Prospectors, and Analyzers. The business strategy profiles of these three types are developed using Venkatraman's (1989a) operationalization of business strategy. Moreover, the paper builds the theoretical profiles of IS strategies that are the most appropriate for Defenders, Analyzers, and Prospectors. Alignment is examined between a company's actual IS strategy and the theory-based IS strategy corresponding to the business strategy it pursues. Performance implications of alignment are then assessed.

The rest of the paper is divided into four sections. Section 2 develops the theoretical background for this study. The methods of data collection and analysis are then described in §3. Section 4 presents the findings of the study. Finally, §5 examines the implications of these results, identifies limitations of the study, and outlines future research directions.

2. Theoretical Development

2.1. Strategy Content and Process

The distinction between content and process has been made in the prior literature on business strategy (e.g., Blair and Boal 1991, Robinson and Pearce 1988) and IS strategy (e.g., Chan and Huff 1992, Das et al. 1991). *Content* concerns the question "What strategy is the organization pursuing?" When focusing on content, it is important to distinguish between three strategies: IS strategy, IT strategy, and information management (IM) strategy. According to Earl (1989), IS strategy focuses on systems or business applications of IT, being concerned primarily with aligning them with business needs and using them to derive strategic benefits. IT strategy is concerned mainly with technology policies, including such aspects as architecture, technical standards, security levels, and risk attitudes. Finally, IM strategy is concerned with the structures and roles for the management of IS and IT, focusing on issues such as the relationships between the specialists and users,

management responsibilities, performance measurement processes, and management controls.

Whereas the IS strategy is about "what" and the IT strategy about "how," the IM strategy is about the "wherefores"—which way? who does it? where is it located?, etc. (Earl 1989, p. 65).

Recognizing the importance of IS, IT, and IM strategies, as well as the infeasibility of examining all three (as well as business strategy) in one study, we decided to focus on IS strategy. IS strategy is directly concerned with business applications, and there have been previous suggestions that it should be aligned with the business strategy (King 1978, Das et al. 1991, Zviran 1990). King (1978) argues that IS strategy should be derived from the business strategy. Lederer and Mendelow (1989) have identified reasons for aligning business and IS strategies, including the increased likelihood of the developed systems being more critical to the organization and the increased likelihood of top-management support for IS projects. These articles implicitly or explicitly suggest that alignment between business and IS strategies enhances business success.

Process concerns the question "How does the organization develop (and implement, etc.) its strategy?" Unlike the limited empirical research on IS strategy content, there has been considerable research on the IS strategy process. Difficulties in developing (Lederer and Mendelow 1987, Henderson and Sifonis 1988) and implementing (Lederer and Sethi 1988) IS strategies have been highlighted; taxonomies of strategic IS planning (Earl 1993) and strategic IS decision making (Sabherwal and King 1995) have been constructed; and contingency relationships between the context and the IS planning process have been investigated (Raghunathan and Raghunathan 1990, Premkumar and King 1994). Differences across Defenders, Analyzers, and Prospectors in strategic IS management sophistication have been examined (Gupta et al. 1997). The need to link the IS planning process with business planning has been emphasized (King 1978, King and Zmud 1981, Boynton and Zmud 1987, Henderson and Venkatraman 1992), and stage models of the evolution of this linkage have been investigated (Synnott 1987, King and Teo 1997). This literature has drawn upon rich concepts from the business strategy literature to

enhance our understanding of the IS strategy process (Boynton and Zmud 1987, Earl 1993, Sabherwal and King 1995).

2.2. The Research Model and Constructs

Figure 1 summarizes the overall model underlying this paper. The emphasis is on strategy content, not process, on realized rather than intended strategies, and on IS strategy rather than IT and IM strategies. We view business strategy types in terms of Miles and Snow's (1978) typology of Defenders, Analyzers, and Prospectors. This typology parsimoniously captures strategic differences in industry-independent terms (Hambrick 1983). It has been subjected to extensive discussion and empirical investigation,¹ thereby facilitating the identification of the theoretical profiles of business strategy variables for each configuration. Moreover, several recent studies (Delery and Doty 1996, Doty et al. 1993, Segev 1989) have identified the theoretical profiles for Miles and Snow's business strategies.

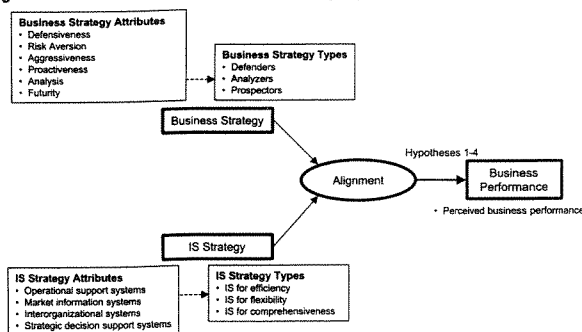
There are also reasons to believe that different IS strategies would be appropriate for the three business strategies: Camillus and Lederer (1985) suggested that these business strategies are associated with different kinds of information systems; Simon (1987) found them to influence the attributes of formal control systems; Gupta et al. (1997) found the three strategies to

differ in information management sophistication; and Karimi et al. (1996a, 1996b) found them to differ in the level of IT investment. Moreover, the prior discussions of each business strategy identify several aspects related to IS strategy, such as the Defenders' emphasis on cost containment, the Prospectors' desire for flexibility and innovation, and the Analyzers' endeavors to simultaneously achieve efficiency and innovation.

As shown in the top portion of Figure 1, the Defender, Analyzer, and Prospector business strategy types are examined using six business strategy attributes—defensiveness, risk aversion, aggressiveness, proactiveness, analysis, and futurity. Based on Venkatraman's (1989a) operationalization of business strategy (called strategic orientation of business enterprises, or STROBE), these attributes view realized business strategy in terms of management actions. Theoretical ideal values of these six business strategy attributes, identified based on prior literature, are used to develop the business strategy profiles for Defenders, Analyzers, and Prospectors. To our knowledge, such mapping of business strategy attributes (Venkatraman 1989a) to business strategy types (Miles and Snow 1978) has not been done previously. The use of fine-grained, multi-item business strategy measures (e.g., those developed by Venkatraman) to determine broad-brush strategic types/classifications (e.g., Miles and Snow's Defenders, Analyzers, and Prospectors) has been rare.

IS strategy attributes are mapped to IS strategy types in a similar manner. The IS strategy best aligned with each business strategy is examined in terms of four IS strategy attributes. Three of these—operational support systems, market information systems, and strategic decision support systems—reflect the traditional classification of information systems into transaction-processing systems, management information systems, and decision support systems, respectively (Anthony 1965, 1988; Camillus and Lederer 1985; Gorry and Scott Morton 1971; Ward et al. 1990). The fourth represents interorganizational information systems, which may be considered a distinct type (Barrett 1986–87, Johnston and Vitale 1988, Rotemberg and Saloner 1991, Suomi 1988). Together, these four IS strategy attributes, focusing on the actual business support provided by the systems, reflect three types of

Figure 1 The Overall Model Underlying the Paper



¹Zahra and Pierce (1990) examined 17 empirical investigations of Miles and Snow's business strategies. In addition, several publications since Zahra and Pierce's survey have further examined this typology (e.g., Delery and Doty 1996; Doty et al. 1993; Gilbert 1995; Karimi et al. 1996a, 1996b; Miles and Snow 1994; Segev 1989).

IS strategies corresponding to the Defender, Analyzer, and Prospector business strategies. As discussed later, "IS for efficiency," "IS for flexibility," and "IS for comprehensiveness" IS strategy types are believed to be best aligned with Defender, Prospector, and Analyzer business strategies, respectively.

Alignment, then, is examined between the three business strategy types and the three IS strategy types. Several authors highlight the importance of this alignment (Cash et al. 1988, King 1978, Zviran 1990). It is implicitly believed that the alignment between business and IS strategies helps enhance performance. This belief is empirically investigated in this paper. Performance implications are examined in terms of the perceived business performance. Greater alignment between an organization's business strategy and IS strategy indicates that the systems are targeted on areas that are critical to its success. Consequently, IS may be expected to contribute to the business performance to a greater extent than in organizations where they focus on less important areas (Das et al. 1991, Sabherwal and Kirs 1994). Organizations with greater alignment between business strategy and IS strategy are also more likely to utilize IS for a competitive advantage (Johnston and Carrico 1988, Wiseman 1988). Therefore, our first hypothesis is as follows:

HYPOTHESIS 1. *The alignment between business strategy and IS strategy is positively associated with perceived business performance.*

2.3. Defenders, Prospectors, and Analyzers

Miles and Snow (1978) identified three viable business strategies: Defenders, Prospectors, and Analyzers.²

²They also described a fourth type of organization (Reactors), but considered it to be an organization that either lacks a viable strategy or is in transition from one of the three ideal strategies to another. According to Zahra and Pearce (1990, p. 752), "Reactors do not follow a conscious strategy," while according to Daft and Weick (1984, p. 292), "the reactor strategy is not really a strategy at all." We therefore decided to exclude Reactors. Most empirical studies on Miles and Snow's typologies have similarly excluded Reactors (e.g., Delery and Doty 1996; Hambrick 1981, 1983; Shortell and Zajac 1990). Moreover, Doty et al. (1993) compared the effectiveness of the typology with and without Reactors, and found empirical support for excluding Reactors. Finally, Miles and Snow have excluded Reactors in their more recent descriptions of the typology. For example, a table comparing alternative business strategies in Miles and Snow (1984)

The *Defender* is the most stable of the three. It seals off a stable and predictable but narrow niche in its industry by offering high-quality (but standard) products or services at low prices. Stressing operational efficiency and economies of scale, it employs a mechanistic organization structure. It has greater fixed-asset intensity than the other strategic types, with investments in highly cost efficient but few core technologies. However, the Defender does not tend to search outside its domain for new opportunities, and rarely makes major adjustments in its structure or technology.

The *Prospector* is very different. It continuously seeks new product/market opportunities, and is the creator of change in its market. Emphasizing innovativeness, the Prospector invests heavily in product R&D and environmental scanning. To function in a broad and dynamic domain, it seeks flexibility in technology (as reflected in a low fixed-asset intensity) and uses an organic organization structure. However, the concern with flexibility and innovativeness often leads to a lack of controls and low operational efficiency.

The *Analyzer* shares some characteristics with each of the other two strategies. Combining the strengths of the other two types, it seeks to simultaneously minimize risk while maximizing opportunities for growth. It maintains a stable domain of core products, while seeking new product/market opportunities. It does not usually initiate new products but often follows the Prospector by very quickly introducing competitive, and occasionally better, products. Thus, unlike the Defender, it does not eschew change, but unlike the Prospector, it does not create change. To address conflicting demands of efficiency and innovation, the Analyzer uses a matrix organization structure, and a dual technological core, with stable and flexible components. Of course, these conflicting demands are difficult to address simultaneously, and the organization may fail to address one or both. The dual focus may also imply larger organization size (Doty et al. 1993).

only compared Defenders, Prospectors, and Analyzers. Similarly, in their 1994 book, they comment: "(managers) need to select a competitive strategy from the menu of generic approaches such as Prospector, Defender, or Analyzer" (p. 17).

2.4. Business Strategy Profiles of Defenders, Analyzers, and Prospectors

Venkatraman's (1989a) STROBE operationalization of business strategy is a widely used one (e.g., Chan et al. 1997, Croteau and Bergeron 1999, Gilbert 1995), but it has not, to the best of our knowledge, been used to examine Defenders, Analyzers, or Prospectors. Therefore, we developed the ideal business strategy profiles for the three configurations by drawing upon a variety of prior research focusing on one or more of the six business strategy attributes. We reviewed the two books by Miles and Snow (1978, 1994), as well as several articles (Snow and Hrebiniak 1980; Hambrick 1981, 1983; Miles et al. 1978; Zahra and Pearce 1990; Chagnanti and Sambharya 1987; Delery and Doty 1996). The ideal profiles developed independently by Segev (1989) and Doty et al. (1993) were especially useful.³ However, unlike Segev (1989) and Doty et al. (1993), who identify the ideal profiles on continuous scales, we use a more parsimonious three-point scale of high, medium, and low. Table 1 provides the business strategy profiles for the three strategic types, while Appendix A summarizes the prior literature on which they were based. As may be seen from the Appendix, the choices were relatively unambiguous.

Two strategic attributes, *defensiveness* and *proactiveness*, represent Defenders and Prospectors, respectively, in Venkatraman's (1989a) STROBE measure. Defenders and Prospectors therefore rank high on defensiveness and proactiveness and low on proactiveness and defensiveness, respectively. Analyzers, in

contrast, are medium in both aspects. These elements of the strategic profiles are consistent with Segev (1989), Hambrick (1983), and Miles and Snow (1978).

Risk aversion is the reverse of Venkatraman's (1989a) "riskiness" and Segev's (1989) "level of risk." Venkatraman (1989a, p. 949) included "riskiness reflected in various resource allocation decisions as well as choice of products and markets" as a key aspect of business strategy. In this study, riskiness was considered in reverse, i.e., as risk aversion. Based on Segev's scores for the level of risk (reverse of risk aversion), Defenders, Analyzers, and Prospectors were considered high, high, and low in risk aversion, respectively. The Defender plays it safe by operating in a narrow stable domain, whereas the Prospector frequently takes risks with untried products. The Analyzer is also highly risk averse; it looks for opportunities to grow, but it only adds new products/services that another organization (a Prospector) has already shown to work successfully.

The ideal scores for *analysis*, representing "the organization's overall problem-solving behavior, including the tendency to search deeper for the roots of problems and to generate the best possible solution alternatives" (Venkatraman 1989a, p. 948) were also based on Segev (1989). Segev included two kinds of analysis—internal and external. He found only the Analyzer to be high in both internal and external analyses. Therefore, the Analyzer is considered high in terms of analysis. On the other hand, Segev ranked Prospectors and Defenders as high on one aspect of analysis but not on the other; therefore, both of these configurations are considered as medium in analysis. These ideal scores also appropriately reflect the view of planning of Miles et al. (1978) as both comprehensive and intensive at Analyzers, intensive but not comprehensive at Defenders, and comprehensive but not intensive at Prospectors.

Futurity or future-orientation, reflecting "the relative emphasis of effectiveness (long-term) considerations versus efficiency (shorter-term) considerations" (Venkatraman 1989a, p. 948), was rated by Doty et al. (1993) but not by Segev (1989). Following Doty et al. (1993), we consider Defenders, Prospectors, and Analyzers as high, medium, and medium, respectively, on futurity. Viewing Defenders and Analyzers as high

Table 1 Business Strategy Profiles of Defenders, Prospectors, and Analyzers

Business Strategy Attributes	Defenders	Prospectors	Analyzers
Defensiveness	High	Low	Medium
Risk Aversion	High	Low	High
Aggressiveness	Medium	High	Medium
Proactiveness	Low	High	Medium
Analysis	Medium	Medium	High
Futurity	High	Medium	Medium

³We used the ideals developed by Segev (1989) and Doty et al. (1993) after converting them from their continuous, seven- or eight-point scales, to our three-point scales of high, medium, and low.

and medium in futurity, respectively, reflects the inherent nature of these organizations. Rating Prospectors as medium in futurity conforms to Doty et al. and is consistent with: (a) the Prospectors' higher investment in research and development (Hambrick 1983; Miles and Snow 1978, 1994); (b) their greater use of sophisticated, formal planning approaches (Odom and Boxx 1988, Shortell and Zajac 1990); and (c) Miles and Snow's (1994) view that "(the Prospectors) achieve success by being first, either by anticipating where the market is going or by shaping the market's direction through their own research and development efforts" (p. 12).

Both Segev (1989) and Doty et al. (1993) rate the three configurations on *aggressiveness*, which reflect the organization's efforts toward "improving market rates at a relatively faster rate than the competitors in its chosen market" (Venkatraman 1989a, p. 948). Segev (1989) and Doty et al. (1993) rate Prospectors and Analyzers similarly on attributes reflecting aggressiveness (high and medium, respectively), but they differ in their view of Defenders, rating them as low and medium, respectively. The rating by Doty et al. (1993) was preferred based on other prior literature. For example, Miles and Snow (1978) view Defenders as being aggressive in their selected domain: "A Defender's success in the industry hinges on its ability to maintain aggressively its prominence within the chosen market segment" (p. 36). Furthermore, Shortell and Zajac (1990) rate Defenders, Prospectors, and Analyzers as medium, high, and medium, respectively, on the attribute most related to aggressiveness (emphasis on new services and markets for core services).

2.5. IS Strategy Profiles of Defenders, Analyzers, and Prospectors

The ideal profiles of IS strategy attributes for Defenders, Analyzers, and Prospectors are given in Table 2. The development of these profiles was also based on the previously described review of the literature on Miles and Snow typology, along with the literature that has examined the IS implications of Prospector, Defender, and Analyzer strategies (e.g., Camillus and Lederer 1985; Karimi et al. 1996a, 1996b; Gilbert 1995).

Operational support systems represent the use of IS for monitoring and controlling the day-to-day operations.

Table 2 IS Strategy Profiles of Defenders, Prospectors, and Analyzers

	Defenders	Prospectors	Analyzers
IS Strategy Attributes	IS for Efficiency	IS for Flexibility	IS for Comprehensiveness
Operational support systems	High	Low	Medium
Market information systems	Low	High	High
Interorganizational systems	High	Medium	High
Strategic decision support systems	High	High	High

Increased use of IS for operational support would generally be expected to facilitate operational efficiency. In light of Segev's (1989) rating of the importance of operational efficiency as high, medium, and low for Defenders, Analyzers, and Prospectors, respectively, we consider IS for operational support in a similar fashion. This is also consistent with Segev's (1989) ratings for control systems. The low score for the Prospector is further supported by Miles and Snow's (1978) argument that its "administrative system may, at least temporarily, underutilize and misutilize resources" (p. 67). In contrast, "(the Defender's) administrative system is ideally suited for generating and maintaining efficiency" (Miles et al. 1978, p. 551). Miles and Snow (1994) emphasize the importance of the Defenders' operational systems more recently as well, highlighting their "need to tie operations together with plans and systems that incorporate scale and experience into standard operating procedures" (p. 15). Camillus and Lederer (1985) also view transaction processing systems, which closely resemble our "operational support systems," to be the most appropriate for Defenders and the least appropriate for Prospectors. Defenders may be expected to encounter slower changes in the nature of their transactions and, consequently, operational support systems may be expected to play a greater role than in Prospectors, which frequently enter new business domains and therefore undergo more regular changes in their basic business transactions.

Market information systems are related to management information systems but with a greater focus on the company's markets and product sales. It has been argued, and empirically found, that Prospectors

more closely monitor their product/market trends and have greater marketing expenditures than Defenders (Hambrick 1983). Miles et al. (1978) agree that "the Prospector's administrative system is well suited to maintain flexibility" (Miles et al. 1978, p. 553). On the other extreme is the Defender, for which the "primary risk is that of . . . being unable to respond to a major shift in the market environment" (Miles et al. 1978, p. 551). Finally, Analyzers also rank high in terms of the use of market information systems. They observe the market avidly and respond very quickly to market changes. According to Miles and Snow (1978), "(Analyzers') successful imitation is accomplished through *extensive marketing surveillance*" (p. 73; emphasis in original unless otherwise indicated).

There has been less discussion of *strategic decision support systems* in the literature on Defenders, Analyzers, and Prospectors. However, the business strategy attributes discussed above indicate that strategic decision support systems play a major role in all three configurations. In Defenders, these systems contribute to the long-term planning, or futurity, which is a key characteristic of that configuration. In Prospectors, they contribute to proactiveness by helping the organization to make strategic decisions quickly and effectively. For example, in Shortell and Zajac's (1990) study of the hospital industry, a planner from a Prospector hospital commented, "Our planning system provides the basis for deciding what new markets to pursue" (p. 828). Finally, in Analyzers, these systems contribute to the high levels of internal and external analysis performed by the organization.

Prospectors would benefit from *interorganizational systems* to some extent as they emphasize marketing (Miles and Snow 1978). However, because of the greater stability in their customers and suppliers, Defenders and Analyzers would derive greater benefits from interorganizational systems than Prospectors. Upon empirically finding Defenders to have greater forward integration than Prospectors, Hambrick (1983) argued: "(Defenders) probably anticipate few changes in their domains. Prospectors, on the other hand, are reluctant to become entrenched in forward stages because their offerings are always under consideration" (p. 22). Prospectors would also be expected to make

less use of structured interorganizational systems because of their lack of formalization (Doty et al. 1993) and their reluctance to make long-term investments, especially in systems that would constrain them through IT links to specific organizations. Analyzers would make greater use of interorganizational systems because of their relatively greater stability and formalization (Doty et al. 1993). Also, interorganizational systems would provide Analyzers sales-related information that would facilitate the often complex coordination between their marketing and production functions (Miles and Snow 1978).

To summarize, for Defenders, an "*IS for efficiency*" strategy—oriented toward internal and interorganizational efficiencies and long-term decision making—would be appropriate (Camillus and Lederer 1985). An "*IS for flexibility*" strategy—focusing on market flexibility and quick strategic decisions—seems suitable for Prospectors. Finally, an "*IS for comprehensiveness*" strategy—enabling comprehensive decisions and quick responses through knowledge of other organizations—would fit Analyzers. This alignment of the three IS strategies with the three business strategies is shown in Figure 2. The expected relationship between alignment and perceived business performance leads to the following hypotheses for the three business strategy types:

HYPOTHESIS 2. *For Defenders, the alignment between IS strategy and the "IS for efficiency" strategy is positively associated with perceived business performance.*

HYPOTHESIS 3. *For Prospectors, the alignment between IS strategy and the "IS for flexibility" strategy is positively associated with perceived business performance.*

HYPOTHESIS 4. *For Analyzers, the alignment between IS strategy and the "IS for comprehensiveness" strategy is positively associated with perceived business performance.*

Figure 2 Levels of Alignment Between Various Business and IS Strategies

IS for Efficiency	High	Low	Low
IS for Flexibility	Low	High	Low
IS for Comprehensiveness	Low	Low	High
	Defenders	Prospectors	Analyzers

3. Methods

3.1. Data Collection

To empirically examine the performance implications of alignment, two separate surveys were administered. This enabled the researchers to test each research hypothesis for each of the two survey datasets and also for the combined dataset. A four-year time gap between the surveys (1991, 1995) also ensured that the researchers were investigating nontransient phenomena. To further increase the generalizability of the findings, the surveys focused on four different industries. Extensive pretesting (Dillman 1978) and minor revisions of the research instruments occurred before both surveys. The pretesting involved academic reviews, questionnaire item sorting exercises (Moore and Benbasat 1991), preliminary factor analyses, interviews with IS executives and consultants, and pilot testing of the questionnaires with appropriate senior executives in multiple organizations.

In each survey, Dun and Bradstreet directories were used to compile lists of North American firms operating in financial services (insurance/SIC 6321 and banking/SIC 6025) and manufacturing (pharmaceutical preparations/SIC 2834 and auto parts/SIC 3714). In the smaller SIC 6321, 2834, and 3714 classifications, all companies with more than 100 employees, were contacted. In the larger banking industry, there were more U.S. banks than required for the survey. So a random sample of these banks was obtained—every third U.S. bank with over 100 employees was contacted.⁴

Company CEOs were contacted by an introductory letter and a follow-up phone call describing the study and eliciting the company's support. CEOs were then mailed a set of questionnaires on business strategy, IS strategy, business performance, and IS performance. These were to be completed separately by multiple executives within the firm. Postcards and letters reminding the CEO of the study's importance and encouraging the company to participate later followed.

Four respondents—the CEO, CIO, CFO, and a senior end user (VP)—were asked to complete four questionnaires in the first survey. In the second survey, two

respondents—the CIO who described the IS strategy and the CEO who addressed business strategy and IS and business performance—were asked to complete two questionnaires. As may be expected with surveys involving senior executives and multiple respondents (Raghunathan and King 1988, Venkatraman 1989a), response rates were low in both surveys. It was thought that two (versus four) respondents in the second survey would demand a smaller overall investment of time by the firm and would result in greater survey participation. Unfortunately, the change had the opposite effect. The response rate dropped from 19% in the first survey to 7% in the second. CEOs appeared more willing to have administrative assistants coordinate responses from multiple executives within the firm than to increase their own personal commitment of time to the survey. It should be noted that 164 and 70 complete sets of responses—i.e., 164×4 and 70×2 questionnaires—were received in the first and second studies, respectively.⁵ As shown in Table 3, very senior executives provided the data.

To assess whether any nonresponse bias existed, statistics were compiled separately for all companies surveyed, all companies returning questionnaires, and companies returning questionnaires late in the survey, i.e., after several reminders. The only evidence of bias that could be detected was toward smaller firms and Canadian firms. Therefore, the results of data analyses were validated using organization size and location as control variables. Sample characteristics of the respondent companies in the two surveys are given in Table 4.

3.2. Measures

Business strategy attributes and IS strategy attributes were measured using five-point scales, ranging from 1 = strongly disagree to 5 = strongly agree. The questionnaire items for business strategy attributes and IS strategy attributes are provided in Appendices B and C, respectively. These appendices also provide the results of principal components analyses that confirmed

⁴In the second survey, funding was limited and the SIC 6025 industry group was eliminated entirely.

⁵To ensure that each company received an equal weighting in the combined dataset, information supplied by companies responding to both surveys was used only the first time it was received, i.e., in the Survey 1 dataset. Of the 234 combined dataset entries, only the 226 that were independent were used in the data analyses.

Table 3 The Survey Respondents

Business Strategy Questionnaire	Survey 1	Survey 2	Combined Sample
President/Acting President	74	11	85
Vice President	65	27	92
Chief Operating Officer	1	1	2
Chief Financial Officer	0	5	5
Director	6	6	12
Controller	1	4	5
Manager	9	8	17
Missing	8	0	8
Total	164	62	226

IS Strategy Questionnaire	Survey 1	Survey 2	Combined Sample
Chief Information Officer, Executive Vice President, Senior Vice President, or Vice President	115	23	138
Chief Financial Officer	1	2	3
Senior Director/Director	21	12	33
Controller	3	6	9
General Manager/Manager/Assistant Vice President	18	17	35
Superintendent	1	1	2
Missing	5	1	6
Total	164	62	226

the expected factor structures of business strategy and IS strategy.

Prior research has shown that managerial assessments of company performance are highly correlated with internally obtained objective performance indicators (Dess and Robinson 1984) and objective performance indicators obtained from secondary data sources (Venkatraman and Ramanujam 1986). Therefore, we relied on a perceptual measure of business performance (Venkatraman 1989a, Chan et al. 1997), involving eight items: (1) reputation among major customer segments; (2) frequency of new product or service introduction; (3) return on investment; (4) net profits; (5) technological developments and/or other innovations in business operations; (6) product quality; (7) market share gains; and (8) revenue growth. These items were measured using five-point scales that compared the company to its competition, ranging from 1 (much worse than the competition) to 5 (much better than the competition). Factor analysis of the

Table 4 Some Characteristics of the Companies Studied

Industry	Frequencies			Perceived Business Performance (5-Point Scale)	
	Survey 1	Survey 2	Combined	Mean	S.D.
Pharmaceutical manufacturing	27	29	56	3.44	0.69
Auto parts manufacturing	40	17	57	3.35	0.64
Banks	39	—	39	3.52	0.65
Insurance	58	16	74	3.40	0.58
Missing information	0	0	0		
Total	164	62	226	3.42	0.63

	Frequencies				
	Survey 1	Survey 2	Combined		
Total No. of Employees					
<300	75	23	98		
301-700	40	19	59		
701-1,000	9	7	16		
1,001-5,000	32	11	43		
5,001-25,000	5	1	6		
>25,000	3	1	4		
Missing	0	0	0		
Annual Revenue (in \$Million)					
<20	17	9	26		
21-50	35	10	45		
51-100	36	6	42		
101-500	43	24	67		
501-1000	15	7	22		
>1000	16	6	22		
Missing	2	0	2		
IS Employees					
<10	60	26	86		
10-50	52	27	79		
51-100	21	3	24		
101-250	1	4	5		
251-500	7	1	8		
>500	6	1	7		
Missing	0	0	0		
Annual IS Budget (in \$ Million)					
<0.25	37	14	51		
0.251-0.999	35	11	46		
1-10	59	24	83		
10.1-25	17	8	25		
25.1-50	6	4	10		
>50	8	1	9		
Missing	2	0	2		
Total	164	62	226		

eight items (with eigenvalue ≥ 1 criterion) produced two factors, explaining 46.4 percent and 14.3 percent of the variance. However, the scree plot suggested one major factor, as expected. Therefore, we proceeded with the analysis based on the one-factor solution.

The means, standard deviations, and reliabilities of all the research variables are given in Table 5. As may be seen from this table, the reliabilities are generally acceptable; for the overall sample, all the reliabilities were at or above 0.60, which is considered satisfactory for new measures (Nunnally 1978).

3.3. Data Analysis

Empirical investigations of the alignment between business and IS strategies focus on one or more variables representing these strategies (Chan and Huff 1993, Zviran 1990). Despite their effectiveness in assessing the performance implications of alignment, an approach that examines alignment using interaction terms or moderating effects of variables becomes cumbersome and problematic when multiple variables are involved.⁶ Because of these difficulties, a profile deviation approach relying on a theoretical or empirical "configuration" is recommended for assessing alignment between two multivariate constructs (Drazin and Van de Ven 1985, Gresov 1989, Sabherwal and Kirs 1994, Venkatraman and Prescott 1990). A configuration is defined as "any multidimensional constellation of conceptually distinct characteristics that commonly occur together" (Meyer et al. 1993, p. 1175). Configurations take a step beyond the traditional contingency theoretic view by using a holistic rather than a reductionistic stance. They offer richer insights by focusing on parsimonious and relatively homogeneous groups rather than diverse concepts. They help in understanding relationships, such as that between business and IS strategies:

Consider, for example, two companies with different business strategies. (A typology approach will be used for simplicity's

⁶Venkatraman (1989b) provides an excellent review of such issues in assessing the effects of alignment between multidimensional constructs. For example, when business and IS strategies comprise six and four variables, respectively, 24 interaction terms are involved in assessing alignment using interactions, which raises questions concerning the number of interactions needed to be significant to demonstrate that alignment affects performance.

sake.) If one company is a low cost producer while the other attempts to differentiate itself through an emphasis on customer service, the use of technology primarily as a tool to maximize the efficiency of company operations is congruent with the first company's strategy, but not necessarily with the second's (Chan and Huff 1992, p. 195).

Four broad steps were involved in the data-analysis process: (1) normalization of research variables within each industry in each survey; (2) classification of all respondent companies into Defenders, Prospectors, and Analyzers; (3) computation of alignment between business strategy and IS strategy; and (4) testing of the four research hypotheses. These steps, and the specific tasks within each step, are summarized in Figure 3 and discussed below.

Step 1. Normalization. Recognizing that "strategy is a relative phenomenon" (Hambrick 1983, p. 8), we sought to control for cross-industry differences. Dess et al. (1990) have identified several approaches for doing so.

There are several methods by which multiple industry control variables may be applied. Among these are . . . use of industry dummy variables (a coarse-grained measure), and adjustment for industry averages of critical values under study and/or performance variables (p. 20).

Based on Dess et al. (1990) and Hambrick (1983), the following approach was used to correct for across-industry differences in means and standard deviations of all the research variables.⁷ Before the data analysis, the sample for each survey was split based on industry. This produced a total of seven subsamples, including four industry subsamples for Survey 1 and three industry subsamples for Survey 2. Standardized values of all the research variables were computed for each subsample. The subsamples were then recombined, and the standardized scores were used for the remaining data analyses.

Step 2. Classification into Defenders, Prospectors, and Analyzers. The respondent companies within each survey were next classified into the three business strategy types, based on the proximity of each company's

⁷These included measures of business strategy, IS strategy, and organizational performance, as well as variables such as organization size, which were not included in the research model but were used as controls in regressions.

Table 5 The Research Variables*

	Reliability	No. of Items	Survey 1 (<i>n</i> = 164)		Survey 2 (<i>n</i> = 62)		Combined Sample (<i>n</i> = 226)	
			Mean	S.D.	Mean	S.D.	Mean	S.D.
Business Strategy Attributes								
Defensiveness	0.74	4	4.07	0.61	3.99	0.70	4.04	0.64
Risk aversion	0.67	3	3.51	0.80	3.16	0.68	3.42	0.78
Aggressiveness	0.60	3	2.51	0.80	2.63	0.93	2.54	0.84
Proactiveness	0.71	3	2.99	0.81	3.15	0.74	3.04	0.79
Analysis	0.72	3	3.74	0.76	3.81	0.87	3.76	0.79
Futurity	0.73	2	3.14	1.02	3.45	0.88	3.22	0.99
IS Strategy Attributes								
Operational support systems	0.88	6	3.65	0.75	3.51	0.81	3.61	0.77
Market information systems	0.67	4	3.32	0.78	3.02	0.75	3.24	0.78
Interorganizational systems	0.79	4	3.11	0.76	3.43	0.84	3.20	0.79
Strategic decision support systems	0.70	3	2.82	0.91	3.18	0.91	2.92	0.92
Perceived Business Performance	0.83	8	3.33	0.64	3.66	1.01	3.42	0.63

*All variables are measured on a five-point scale.

business strategy attributes to the ideal profiles for Defenders, Prospectors, and Analyzers. Three tasks were performed in this step.

First, the ideal business strategy profile (in terms of the six business strategy attributes) was identified profiles for Defenders, Prospectors, and Analyzers. This profile was based on the theoretical profiles of the three strategy types in terms of the six business strategy attributes, as discussed earlier and summarized in Table 1. Following Govindarajan (1988), high and low values for the ideal business strategy values were operationalized as +1 and -1, respectively. A medium ideal value was operationalized as a normalized score of zero.⁸

Second, the Euclidian distance between each firm's business strategy and the three groups' ideal business strategies was computed. For example, for any company, its distance from Defenders was computed as follows:

⁸In other words, ideal scores of high, medium, and low on a business strategy attribute imply that in terms of that attribute, the ideal value would be one standard deviation greater than, the same as, and one standard deviation less than, respectively, the mean score for the companies in that industry (and within that survey).

$$\text{Distance (Defenders)} = \sqrt{\sum (X_j - I_{j,\text{DEF}})^2}, \quad (1)$$

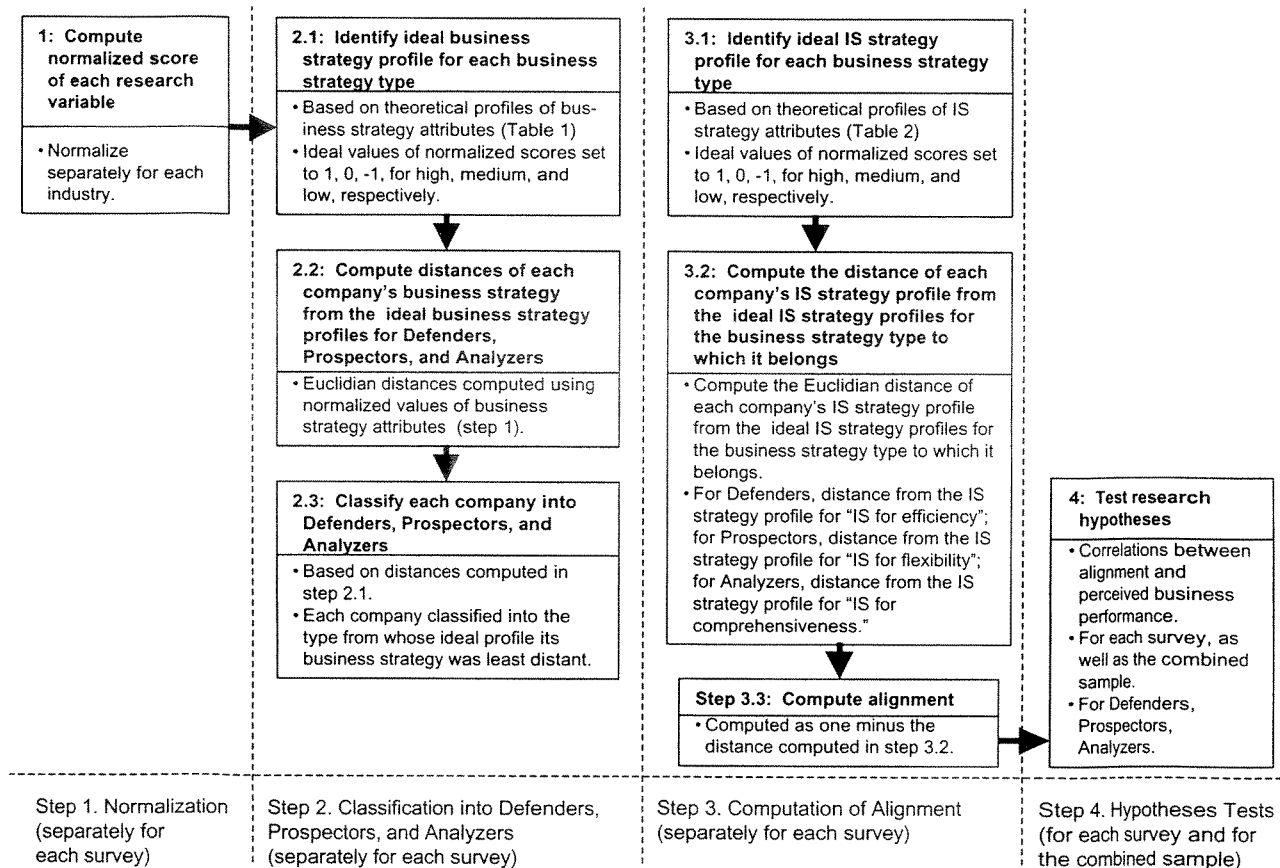
where X_j = the normalized score for the j th business strategy attribute, $I_{j,\text{DEF}}$ = the ideal normalized score of the j th business strategy attribute for Defenders, the Σ is across the various values of j , and j ranges from 1 to 6 for the six business strategy attributes.

The distances from the ideal business strategy profiles for Prospectors and Analyzers were similarly computed. This process produced three distance measures for each company, indicating its distances from the ideal profiles for Defenders, Prospectors, and Analyzers.

Third, these distances were used to classify each company into one of the three business strategy types. This was done by examining which of the three distances for that company was the lowest, as that indicates the ideal business strategy most closely resembling the company's business strategy.⁹ For example, if a company had standardized scores of 0.5, 0.7, -0.3, -0.4, 0.8, and 1.3, respectively, on defensiveness, risk

⁹We had decided that in case two of the three distances were tied for the lowest value, we would exclude the company from further analysis. No such case was encountered, however.

Figure 3 The Analytical Approach



aversion, aggressiveness, proactiveness, analysis, and futurity, then the distance scores for the company, Distance (Defenders),¹⁰ Distance (Prospectors), and Distance (Analyzers), would be 1.23, 3.33, and 1.52, respectively. As Distance (Defenders) is the lowest, the company would be classified as a Defender.

Step 3. Computation of Alignment Between Each Company's Business Strategy and Its Group's Ideal IS Strategy. Three tasks were involved in this step. First, the ideal IS strategy profiles for Defenders, Prospectors, and Analyzers were constructed in terms of the four IS strategy attributes. This was done based on the theoretical IS strategy profiles that were discussed earlier and

summarized in Table 2. Again, ideal values of high, medium, and low were operationalized as 1, 0, and -1, respectively.

Second, we computed the Euclidian distance between each firm's IS strategy and the ideal IS strategy for the business strategy type¹¹ to which it belonged. For example, if a company had been (in Step 2, discussed earlier) classified as a Defender, the distance was computed from the ideal IS strategy profile for "IS for efficiency," because that IS strategy was expected to be best aligned with the Defender business strategy.

Third, alignment was computed by subtracting the

¹⁰For example, Distance(Defenders) would, in this case, be computed as equaling: $(0.5 - 1)^2 + (0.7 - 1)^2 + (-0.3 - 0)^2 + (-0.4 - (-1))^2 + (0.8 - 0)^2 + (1.3 - 1)^2 = 1.23$.

¹¹This distance was computed in a fashion similar to that of Equation (1), although the four IS strategy attributes (and the corresponding ideal values) were used, instead of the six business strategy attributes.

above distance from 1. Smaller Euclidean distance indicates that the IS strategy is closer to the ideal profile and that the degree of alignment is higher. Therefore, subtracting the distance measure from 1 helped convert it into a measure of alignment.

Step 4. Hypotheses Tests. All of the research hypotheses focused on only two variables—perceived business performance and alignment. They can be adequately examined using a correlation coefficient between these two variables without sacrificing any significant information that would be obtained from regression analysis.

Hypothesis 1 was tested by examining the correlation between perceived business performance and alignment across the three strategies. Hypotheses 2, 3, and 4 were tested using the correlations between perceived business performance and alignment within the corresponding set of companies (Defenders, Prospectors, or Analyzers). All the hypotheses were tested separately for Surveys 1 and 2, as well as in the combined sample. Although the two surveys were analyzed separately in Steps 1, 2, and 3, it was deemed appropriate to combine the two surveys in this step because, for each company, both these variables are normalized relative to others in that company's survey¹² (Dess et al. 1990, Hambrick 1983).

4. Results

4.1. Defenders, Prospectors, and Analyzers

We found 48, 78, and 100 of the companies to be closest to the ideal profiles of the Defenders, Prospectors, and Analyzers, respectively. In Survey 1, there were 36, 55, and 73 Defenders, Prospectors, and Analyzers, respectively, whereas the corresponding frequencies in Survey 2 were 12, 23, and 27, respectively. The two surveys did not significantly differ in the frequencies of the three business strategy types ($\chi^2 = 0.32$, degrees of freedom = 2; not significant at $p \leq 0.10$). In both surveys, Analyzers were more frequent than the other two

strategic types. This higher proportion of Analyzers is consistent with prior studies of these configurations (Conant et al. 1987, McDaniel and Kolari 1987, Odom and Boxx 1988, Smith et al. 1989, Zajac and Shortell 1989).

Table 6 summarizes the frequencies of the three types within each industry. It also indicates the means and standard deviations of the perceived business performance for each business strategy type. The three types seem to be equally successful. This conforms to Miles and Snow's (1978) view of the three strategies as equally viable, as well as to later theoretical discussions (e.g., Zahra and Pearce 1990) and empirical results (Snow and Hrebiniak 1980).¹³

There was also no significant association between business strategy and industry (for the entire sample, for example, we found: $\chi^2 = 1.87$, degrees of freedom = 6; not significant at $p \leq 0.10$). This is similar to the results of prior research. Based on a meta-analysis of 17 studies, Zahra and Pearce (1990) concluded:

We were unable to find differences in the number or percentage of firms belonging to different strategic types. We interpreted these results as indicating a lack of an overall association between the characteristics of the industry and the representation of different strategic types (p. 760).

The consistency of the above results with prior research lends confidence to the configurations of Prospectors, Defenders, and Analyzers generated in this study.

4.2. Performance Implications of Alignment

Table 7 summarizes the correlation coefficients between alignment and perceived business performance. Alignment was significantly associated with perceived business performance in the combined sample as well as in Survey 1 and Survey 2. Hypothesis 1—proposing an overall association between alignment and perceived business performance—is thus supported.¹⁴

¹²This is so because alignment was computed separately for each survey, and perceived business performance was also normalized for each survey (in Step 1). Comparison of alignment across the two surveys produced means of -1.3500 and -1.3557 in Surveys 1 and 2, with a t -statistic of 0.04 (not significant at $p \leq 0.10$).

¹³This finding differs from some other empirical studies, which found performance differences among the three strategies (Hambrick 1983, Zajac and Shortell 1989). Zajac and Shortell (1989) found Defenders to be less profitable than Analyzers and Prospectors in the hospital industry, whereas in a multi-industry study Hambrick (1983) found Defenders to be more profitable than Prospectors.

¹⁴All these results were validated using multiple regressions with

Table 6 The Three Strategic Configurations

Industry	Frequencies											
	Defenders			Prospectors			Analyzers			Total		
	S1	S2	C	S1	S2	C	S1	S2	C	S1	S2	C
Pharmaceutical manufacturing	6	4	10	10	11	21	11	14	25	27	29	56
Auto parts manufacturing	10	5	15	11	7	18	19	5	24	40	17	57
Banking	9	0	9	14	0	14	16	0	16	39	0	39
Insurance	11	3	14	20	5	25	27	8	35	58	16	74
Total	36	12	48	55	23	78	73	27	100	164	62	226
Perceived business performance	Defenders Mean (S.D.)			Prospectors Mean (S.D.)			Analyzers Mean (S.D.)			Total Mean (S.D.)		
• Survey 1	3.24 (0.62)			3.34 (0.60)			3.38 (0.68)			3.33 (0.64)		
• Survey 2	3.52 (0.60)			3.64 (0.69)			3.71 (0.43)			3.65 (0.57)		
• Combined sample	3.31 (0.62)			3.43 (0.64)			3.47 (0.64)			3.42 (0.63)		

S1: Survey 1, S2: Survey 2, C: Combined S1 and S2.

Note. The cross-tabulation of strategy by industry is done in terms of observed frequencies. The frequencies are given as Survey 1 frequency, Survey 2 frequency, and Combined frequency. For example, there were 10, 11, and 21 Prospectors in the Pharmaceutical Manufacturing Industry in Survey 1, Survey 2, and in the total survey. This is indicated by 10 under the S1 heading, 11 under the S2 heading, and 21 under the C (combined) heading. The chi-square test did not find a significant association between business strategy and industry type for Survey 1, Survey 2, or the combined sample.

Table 7 Implications of Alignment for Organizational Performance*

	Correlation Between Alignment and Perceived Business Performance	<i>n</i>	Conclusion
Whole sample	0.19**	226	Support for Hypothesis 1.
Survey 1	0.17*	164	
Survey 2	0.23*	62	
Defenders, Combined sample	0.02	48	Lack of support for Hypothesis 2.
Defenders, Survey 1	-0.02	36	
Defenders, Survey 2	0.04	12	
Prospectors, Combined sample	0.21*	78	Support for Hypothesis 3.
Prospectors, Survey 1	0.24*	55	
Prospectors, Survey 2	0.11	23	
Analyzers, Combined sample	0.26**	100	Support for Hypothesis 4.
Analyzers, Survey 1	0.23*	73	
Analyzers, Survey 2	0.37*	27	

** $p \leq 0.01$, * $p \leq 0.05$

Note. Similar results were obtained when multiple regressions were conducted with perceived business performance as the dependent variable and a number of control variables including three industry dummies, country, organization size, organization age, and changed in business strategy.

Alignment was also significantly associated with perceived business performance in Prospectors (in the combined sample as well as in Survey 1 but not in Survey 2) and Analyzers (in the combined sample, Survey 1, and Survey 2), thereby providing support for Hypotheses 3 and 4. However, alignment was not significantly associated with perceived business performance in Defenders (the correlation coefficient was not significant in the combined sample, Survey 1, or Survey 2), thereby indicating a lack of support for Hypothesis 2.

5. Discussion

5.1. Implications

Several implications and contributions of this paper may be identified. First, the empirical support for Hypotheses 1, 3, and 4 lends further support to the argument that alignment between business and IS strategies improves business performance. The paper suggests that alignment between business strategy and IS strategy is associated with the company's *business* success. This implies that alignment is more important than we could conclude by only examining the relationship between alignment and IS success. This also suggests to practitioners that it is not enough to simply monitor the *level* of IT investment within an organization (e.g., by using industry-specific benchmark data) but that it is necessary also to understand and monitor the *nature* of this investment (e.g., the kinds of systems). In Table 2, we identified the kinds of systems that would be appropriate for Defenders, Analyzers, and Prospectors and found support for these expectations for Analyzers and Prospectors. This suggests, for example, that Prospectors would find it more beneficial to develop and use market information systems and strategic decision support systems rather than operational support systems. Moreover, this finding suggests that imitating a competitor's systems can

be less advantageous to a business than expected, unless there are strong similarities in the firms' business strategies.

Second, the support for Hypotheses 3 and 4, combined with the lack of support for Hypothesis 2, suggests that the importance of aligning IS strategy with business strategy may not be as universal as previously believed. In much of the prior literature, the relationship between IS alignment and performance is discussed in the singular (i.e., relationship versus relationships). In this article, we investigated complex links between alignment and performance, and revealed that several relationships exist. More specifically, the significance of the association between alignment and business success depends on the business strategy. For the sample as a whole, and specifically for Prospectors and Analyzers, there is a significant correlation between alignment and performance. However, this association is not observed for Defenders.¹⁵ These firms emphasize stability, operational efficiency, and economies of scale. They infrequently search outside their domains for new business opportunities, and they prefer to make few radical adjustments to the technologies they use. Our findings suggest that for these firms, an emphasis on IS alignment may not improve strategy execution and business success. These findings have potentially radical management implications that will need to be verified in future studies. They suggest that for a small percentage of firms (Defenders comprised just over 20 percent of our sample), a senior management focus on enhancing IS alignment may not yield satisfactory business paybacks. Depending on the business strategy, "preaching" alignment may be inappropriate.

Third, the study provides further insights into Miles and Snow's Defenders, Prospectors, and Analyzers. This typology of business strategy is a well-established one, and this paper contributes to the IS literature by identifying the profiles of IS strategy most suitable for each business strategy. For Prospectors and Analyzers,

perceived business performance as the dependent variable, alignment as the key independent variable, and several control variables, including three dummy variables controlling for the industry effects, the location (United States or Canada), and the company's size and age.

¹⁵Gupta et al. (1997) found the Defenders to be lower than both Analyzers and Prospectors in the integration of IT applications with each other. This low level of cross-application integration in Defenders, as found by Gupta et al. (1997), may potentially be related to the lower importance of strategic alignment in such organizations, as observed in this study.

the suitability of these IS strategy profiles was empirically validated.

Fourth, the paper also contributes to our understanding of Defenders, Prospectors, and Analyzers by developing the profile of the business strategy attributes in terms of Venkatraman's (1989a) operationalization of business strategy. This contribution is important because prior research on the Miles and Snow's typology has not used such a multidimensional, multi-item (multiple items for each dimension), and previously validated business strategy construct. Demonstrating theoretically and empirically that these two distinct approaches to business strategy measurement can be practically and effectively integrated is an important research contribution.

Finally, the paper makes a methodological contribution as well. At a very broad level, the paper highlights the importance of theory in research on alignment. Moreover, as is frequently recommended in the business strategy and IS literature, the study examines alignment from a holistic perspective or systems approach (Drazin and Van de Ven 1985), rather than looking at alignment only at the level of individual variables (i.e., using a bivariate approach). A related benefit of the holistic approach is that the configurations representing IS strategy—which simultaneously involve more than one of the four types of systems—may be better than classifying a firm's systems into one (and only one) of the four types of systems.¹⁶

5.2. Limitations

Despite the above contributions, there are inherent limitations of the study that suggest caution in interpreting and applying the research findings. First, the discussion of typologies, i.e., pure strategies, is a simplification. The ideal Analyzer, Defender, and Prospector business strategies are really archetypes that firms may combine flexibly in practice. To avoid complicating our analysis and discussion, however, we refrained from discussing and testing hybrid strategies in this article.

Second, this study is based on four industries—banking, insurance, pharmaceutical manufacturing,

and auto-parts manufacturing. By limiting the scope of the study to these industries, we were able to view responding firms' business and IS strategies in relation to their competitors and could thus enhance the study's internal validity. However, further research is needed to ascertain the applicability of the results to other industries.

Third, our measure of business performance was a perceptual one, not an objective financial measure such as the ones used by Papp (1999). Moreover, both organizational performance and alignment were measured at the same point in time, although it should be noted that respondents were asked to describe only information systems that had been installed and used in their organizations for at least one year. The results therefore do not: (a) necessarily imply a similar positive effect of alignment on objective measures of business performance and (b) fully reflect long-term impacts of alignment on performance.

Finally, whereas the profiles for business strategies could be derived readily because of the substantial prior literature on the area and the availability of the theoretical ideal profiles in prior studies (Segev 1989, Doty et al. 1993), the development of the ideal profiles for IS strategies was more difficult because of the limited attention to IS in the prior literature on Miles and Snow's (1978) typology. We developed the ideal IS profiles based on a review of this literature and the literature on strategic use of IS.

5.3. Suggestions for Future Research

Several directions for future research emerge from this paper. First, the study demonstrates an effective analytical approach for measuring alignment between two multidimensional and theoretically well-established constructs. This approach involves the development of configurations based on prior theory about one dimension, followed by the assessment of alignment based on prior theory associated with the second dimension. We believe that the literature on IS alignment is beginning to mature and that future studies of alignment could benefit from similarly using established theories from IS or other disciplines (such as the Miles and Snow typology used here). Theory-based analyses, which may provide more robust results and are easier to interpret, would effectively complement the narrative cases (e.g., Reich and Benbasat 1996, McKenney et

¹⁶The authors are grateful to one of the anonymous reviewers for pointing this out and suggesting that enterprise wide systems could simultaneously support more than one of the IS strategy attributes.

al. 1997) and inductive approaches (e.g., Sabherwal and Kirs 1994) commonly found in the strategic IS literature.

Second, further research is needed to examine the lack of support for the relationship between alignment and perceived business performance in Defenders. This is one area where multiple case studies, comparing the relationship between alignment and performance across these business strategies types, would still be valuable in understanding the differences in the importance of IS and in the alignment between business and IS.

Third, the ideal business and IS strategy profiles we developed and used for Defenders, Prospectors, and Analyzers need to be validated further. It would be especially important to examine whether these profiles are equally valid for large (e.g., multinational) and small companies, for companies in industries other than the four studied here, and for companies that are headquartered outside of the United States and Canada. Further research is also needed to theoretically predict, and test, across-industry and across-country differences in performance implications of alignment.

Fourth, in this study, we did not examine the causes

or antecedents of alignment. Further research is needed to examine what factors influence alignment between business and IS strategies. There has already been some qualitative (e.g., Reich and Benbasat 2000) and quantitative (e.g., Luftman et al. 1999) investigation of factors affecting alignment. The rigorous and theory-driven way of assessing strategic alignment proposed in this paper should be useful in such research.

Finally, the processes by which alignment is accomplished (i.e., practically and effectively worked out) in organizations need to be better understood. The cross-sectional nature of this study prevented us from examining both the dynamics of alignment and the long-term performance implications of alignment. Further research—using longitudinal case studies or questionnaire surveys at multiple points in time—are needed to examine these important aspects of alignment.

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Appendix A The Basis for the Ideal Business Strategy Profiles

	Segev† (1989)	Doty et al.† (1993)	This Study	Justification
Defensiveness				
Defenders	Investment in production:	—	High	<ul style="list-style-type: none">• These ideals are consistent with Segev (1989).• They conform to Hambrick's (1983) finding that Defenders are higher than Prospectors in fixed assets/employee. His study did not include Analyzers.• Venkatraman (1989a) included defensiveness as a key attribute of Defenders
Prospectors	High	—	Low	
Analyzers	Low	—	Medium	
	Medium			
Risk aversion				
Defenders	Level of risk: Low	—	High	<ul style="list-style-type: none">• They match Segev's (1989) scores for level of risk (reverse of risk aversion).• Prospectors frequently take risks with untried products. Defenders play it safe by operating in a narrow stable domain. Analyzers are also risk averse; they seek growth opportunities but only add new products/services that have been successfully demonstrated by another organization (Miles and Snow 1978).
Prospectors	High	—	Low	
Analyzers	Low	—	High	

Appendix A (continued) The Basis for the Ideal Business Strategy Profiles

	Segev† (1989)	Doty et al.† (1993)	This Study	Justification
Aggressiveness				
Defenders	Rate of growth: Low	Product/market	Medium	<ul style="list-style-type: none">• The ideals match Doty et al.'s (1993) ratings.• Miles and Snow (1978) view Defenders as being aggressive in their selected domain.• Shortell and Zajac (1990) rate Defenders, Prospectors, and Analyzers as medium, high, and medium, respectively, in their emphasis on new services and markets for core services.
Prospectors	High	development:	High	
Analyzers	Medium	Medium	Medium	
		High		
		Medium		
Proactiveness				
Defenders	Proactive managerial	—	Low	<ul style="list-style-type: none">• These ideals are consistent with those of Segev (1989).• Venkatraman (1989a) included proactiveness as a key attribute of Prospectors.• The ideals conform to prior arguments placing Analyzers between the other two configurations on such key aspects (Hambrick 1981, 1983).• Segev (1989) found only Analyzers to be high in both internal and external analyses. Prospectors and Defenders ranked high on one aspect, but not the other. Therefore, the Analyzer was considered high in terms of analysis, while the other two strategies were considered medium.• The ideals reflect Miles et al. (1978) view of planning at Analyzers, Defenders, and Prospectors, as comprehensive and intensive, intensive but not comprehensive, and comprehensive but not intensive, respectively.
Prospectors	style: Low	—	High	
Analyzers	High	—	Medium	
	Medium			
Analysis††				
Defenders	Internal: High	—	Medium	<ul style="list-style-type: none">• These ratings are consistent with Doty et al. (1993).• Viewing Prospectors as medium rather than low in Futurity is supported by: (a) their high investment in long-term R&D (Hambrick 1983, Miles and Snow 1978); and (b) prior findings that they use more sophisticated planning approaches (Odom and Boxx 1988, Shortell and Zajac 1990).
Prospectors	External: Low	—	Medium	
Analyzers	Internal: Low	—	High	
	External: High			
	Internal: High			
	External: High			
Futurity				
Defenders	—	High	High	
Prospectors	—	Medium	Medium	
Analyzers	—	Medium	Medium	

†Segev's (1989) ratings were on a continuous scale from 1 to 7. We mapped his scores of 1.00 to 2.99 as low, 3.00 to 4.99 as medium, and 5.00 to 7.00 as high.

††Doty et al. (1993, p. 1232) ratings ranged from 1 to 8. We mapped their ratings of 1.00 to 3.33 as low, 3.34 to 5.66 as medium, and 5.67 to 8.00 as high.

†††Venkatraman (1989a) did *not* include this attribute to represent the Analyzer.

Appendix B Factor Analysis of Measures of Business Strategy Attributes

DEF: Factor 1 for Business Strategy—Defensiveness

DEF1	We develop strong relationships with our suppliers.
DEF2	We develop strong relationships with our customers.
DEF3	We optimize coordination across our departments and/or product lines.
DEF4	There is a constant drive to improve operating efficiency.

ANALY: Factor 2 for Business Strategy—Analysis

ANALY1	We tend to be number-oriented and analytical in our operations.
ANALY2	We require detailed, factual information to support our day-to-day decision making.
ANALY3	We develop comprehensive analyses of each business opportunity or challenge we face.

RSKAVR: Factor 3 for Business Strategy—Risk Aversion

RSKAVR1	Our business decisions generally follow “tried and true” paths.
RSKAVR2	We adopt a rather conservative view when making major decisions.
RSKAVR3	In general, our mode of operations is less risky than that of our competitors.

PROACT: Factor 4 for Business Strategy—Proactiveness

PROACT1	We generally increase capacity (i.e., prepare to handle a greater volume of business) before our competitors do the same.
PROACT2	We are usually the first ones to introduce various products and/or services in the market.
PROACT3	We adopt innovations early.

FUT: Factor 5 for Business Strategy—Futurity

FUT1	The performance measures reviewed by the senior management team emphasize our long-term business effectiveness.
FUT2	Our criteria for budget allocations generally reflect long-term considerations.

AGGR: Factor 6 for Business Strategy—Aggressiveness

AGGR1	We sacrifice current profitability to gain market share.
AGGR2	Gaining market share is more important than cash flow.
AGGR3	We frequently use price-cutting to increase our market share.

Rotated Factor Matrix†

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Eigenvalues	3.74	2.41	1.67	1.54	1.19	1.10
% variance	20.8	13.4	9.3	8.5	6.6	6.1
DEF1	0.83174	0.05155	−0.11405	0.02862	0.05602	0.05567
DEF2	0.75921	0.15210	0.14586	0.11524	0.04981	0.03512
DEF3	0.64166	0.21787	−0.02238	0.10339	0.31012	−0.10749
DEF4	0.51852	0.36652	−0.05457	0.28852	0.00903	−0.10428
ANALY1	0.04677	0.81209	0.15713	0.04826	0.07741	0.01408
ANALY3	0.27473	0.75763	0.00565	0.14224	−0.00150	−0.06694
ANALY2	0.14360	0.73665	−0.00336	−0.01603	0.09171	0.01347
RSKAVR2	−0.15302	0.11838	0.81176	−0.12504	0.18948	−0.07434
RSKAVR1	−0.04168	0.06183	0.79158	−0.05597	−0.15774	0.08418
RSKAVR3	0.15180	−0.01258	0.66159	−0.05931	0.07064	−0.12178
PROACT1	0.03669	0.07698	0.07697	0.81134	0.07291	0.05436
PROACT2	0.17728	0.05105	−0.16085	0.76470	−0.01628	0.12088
PROACT3	0.15405	0.05398	−0.36157	0.67338	0.28714	−0.01419
FUT1	0.05438	0.03498	−0.02063	0.07922	0.86619	0.07778
FUT2	0.20501	0.13428	0.09443	0.11091	0.81092	−0.01003
AGGR1	0.11200	−0.01668	0.01295	0.06538	0.17106	0.80098
AGGR2	−0.07152	−0.11858	0.01123	0.11239	0.08237	0.71933
AGGR3	−0.07205	0.11826	−0.16140	−0.03984	−0.26162	0.68203

†The factor solution is based on VARIMAX rotation with factors selected for eigenvalue greater than 1.0.

Appendix C Factor Analysis of Measures of IS Strategy Attributes

ISOPSUP: Factor 1 for IS Strategy—Operational Support Systems

ISOPSUP1	Our IS improve the efficiency of our day-to-day business operations.
ISOPSUP2	Our IS support effective coordination across functions (e.g., marketing, manufacturing) and product lines.
ISOPSUP3	Our IS provide us with the facts and figures we need to support our day-to-day decision making.
ISOPSUP4	Our IS enable us to develop detailed analyses of our present business situation.
ISOPSUP5	Our IS provide sufficiently detailed information to support prudent decision making.
ISOPSUP6	Our IS support detailed analyses of major business decisions.

ISIOR: Factor 2 for IS Strategy—Interorganizational Systems

ISIOR1	Our IS enable us to develop stronger links with suppliers.
ISIOR2	Our IS enhance our ability to negotiate with our suppliers.
ISIOR3	Our IS enhance our ability to negotiate with our customers.
ISIOR4	Our IS enable us to develop stronger links with customers.

ISMARK: Factor 3 for IS Strategy—Market Information Systems

ISMARK1	Our IS assist us in setting our prices relative to the competition.
ISMARK2	Our IS help us introduce new products and/or services in our markets.
ISMARK3	Our IS help us monitor changes in our market share.
ISMARK4	Our IS permit us to rapidly adjust our prices.

ISFUT: Factor 4 for IS Strategy—Strategic Decision Support Systems

ISFUT1	Our IS facilitate strategic business planning.
ISFUT2	Our IS help us model possible future outcomes of alternative courses of action.
ISFUT3	Our IS are used to forecast key indicators of business performance.

Rotated Factor Matrix†

	Factor 1	Factor 2	Factor 3	Factor 4
Eigenvalues	6.85	1.37	1.14	0.97
% variance	40.3	8.1	6.7	5.7
ISOPSUP4	0.77346	0.22381	0.17543	0.20548
ISOPSUP3	0.74511	0.28721	0.18821	0.14869
ISOPSUP6	0.70678	0.11276	0.16614	0.31881
ISOPSUP5	0.70104	0.13791	0.30902	0.20272
ISOPSUP2	0.68817	0.21848	0.24416	0.07908
ISOPSUP1	0.60199	0.37127	0.13455	0.05237
ISIOR1	0.23180	0.74109	0.04713	0.16732
ISIOR3	0.13249	0.70254	0.18573	0.27346
ISIOR2	0.27323	0.68902	0.00628	0.25500
ISIOR4	0.27189	0.62538	0.35594	0.11347
ISMARK1	0.18984	-0.03847	0.80474	0.16592
ISMARK2	0.16661	0.37393	0.63698	0.06056
ISMARK3	0.36261	0.08079	0.49338	0.11390
ISMARK4	0.29510	0.38922	0.47615	-0.05993
ISFUT1	0.18168	0.21705	0.04724	0.79315
ISFUT2	0.10096	0.17375	0.20927	0.76714
ISFUT3	0.37074	0.19766	0.01276	0.57682

†The factor solution is based on VARIMAX rotation. The four-factor solution was preferred over the three-factor solution (based on eigenvalue greater than 1.0) due to: (a) our *a priori* expectation of four factors; (b) the eigenvalue of the fourth factor (0.97) being very close to 1.0; (c) a desire for factors that together explain at least 60 percent of the variance in the items (Hair et al. 1979); (d) the finding that the three-factor solution had multiple loadings and so was not as clean the four-factor solution.

References

- Anthony, R. N. 1965. *Planning and Control: A Framework for Analysis*. Harvard University Press, Boston, MA.
- . 1988. *The Management Control Function*. Harvard Business School Press, Boston, MA.
- Barrett, S. 1986–87. Strategic Alternatives and Inter-Organizational System Implementations: An Overview. *J. Management Inform. Systems* 3(3) 5–16.
- Blair, J. D., K. B. Boal. 1991. Strategy formation processes in health care organizations: A context-specific examination of context-free strategy issues. *J. Management* 17(2) 305–344.
- Boynton, A. C., R. W. Zmud. 1987. Information technology planning in the 1990's: Directions for practice and research. *MIS Quart.* 11(1) 59–71.
- Camillus, J. C., A. L. Lederer. 1985. Corporate strategy and the design of computerized information systems. *Sloan Management Rev.* 26(3) 35–42.
- Cash, J. I., F. W. McFarlan, J. L. McKenney, M. R. Vitale. 1988. *Corporate Information Systems Management: Text and Cases*. Irwin, Homewood, IL.
- Chagnanti, R., R. Sambharya. 1987. Strategic reorientation and upper echelon characteristics. *Strategic Management J.* 8 393–401.
- Chan, Y. E., S. L. Huff. 1992. Strategy: An information systems research perspective. *J. Strategic Inform. Systems* 1(4) 191–201.
- , —. 1993. Investigating information systems strategic alignment. *Proc. Fourteenth Internat. Conf. on Information Systems*, 345–363.
- , —, D. G. Copeland, D. W. Barclay. 1997. Business strategy, information systems strategy, and strategic alignment. *Inform. Systems Res.* 8(2) 125–150.
- Conant, J. S., M. P. Mokwa, S. D. Wood. 1987. Management styles and marketing strategies: An analysis of HMOs. *Health Care Management Rev.* 12(4) 65–75.
- Croteau, A., F. Bergeron. 1999. La trilogie de l'harmonisation technologique: Stratégie d'entreprise, déploiement technologique et performance organisationnelle. *Proc. Admin. Sci. Assoc. Canada* 20(4) 57–67.
- Daft, R. L., K. E. Weick. 1984. Toward a model of organizations as interpretation systems. *Acad. Management Rev.* 9(2) 284–295.
- Das, S. R., S. A. Zahra, M. E. Warkentin. 1991. Integrating the content and process of strategic MIS planning with competitive strategy. *Decision Sci.* 22 953–984.
- Davis, G., M. Olson. 1985. *Management Information Systems*. McGraw-Hill, New York.
- Delery, J., D. H. Doty. 1996. Modes of theorizing in strategic human resource management: Tests of universalistic, contingency, and configurational performance predictors. *Acad. Management J.* 39(4) 802–835.
- Dess, G. G., R. D. Ireland, M. A. Hitt. 1990. Industry effects and strategic management research. *J. Management* 16(1) 6–27.
- , R. B. Robinson, Jr. 1984. Measuring organizational performance in the absence of objective measures: The case of the privately-held firm and conglomerate business unit. *Strategic Management J.* 5(3) 265–273.
- Dillman, D. 1978. *The Total Design Method*. Wiley Interscience, New York.
- Doty, D. H., W. H. Glick, G. P. Huber. 1993. Fit, equifinality, and organizational effectiveness: A test of two configurational theories. *Acad. Management J.* 36(6) 1196–1250.
- Drazin, R., A. H. Van de Ven. 1985. Alternative forms of fit in contingency theory. *Admin. Sci. Quart.* 30 514–539.
- Earl, M. J. 1989. *Management Strategies for Information Technology*. Prentice Hall, Englewood Cliffs, NJ.
- . 1993. Experiences in strategic information systems planning. *MIS Quart.* 17(1) 1–24.
- Gilbert, A. H. 1995. An Analysis of the relationships among information systems design, strategy, and organizational performance using structural equation modeling. Unpublished doctoral dissertation, College of Administration and Business, Louisiana Tech. University, August.
- Gorry, G. A., M. Scott Morton. 1991. A framework for management information systems. *Sloan Management Rev.* (Fall, reprinted Spring 1989).
- Govindarajan, V. 1988. A contingency approach to strategy implementation at the business unit level: Integrating administrative mechanisms with strategy. *Acad. Management J.* 31(84) 828–853.
- Gresov, C. 1989. Exploring fit and misfit with multiple contingencies. *Admin. Sci. Quart.* 34 431–453.
- Gupta, Y. P., J. Karimi, T. M. Somers. 1997. Alignment of a firm's competitive strategy and information technology management sophistication: The missing link. *IEEE Trans. Engrg. Management* 44(4) 400–413.
- Hair Jr., J. F., R. E. Anderson, R. L. Tatham, B. J. Grablovsky. 1979. *Multivariate Data Analysis*. The Petroleum Publishing Company, Tulsa, OK.
- Hambrick, D. C. 1981. Environment, strategy, and power within top management teams. *Admin. Sci. Quart.* 26 253–276.
- . 1983. Some tests of the effectiveness and functional attributes of Miles and Snow's strategic types. *Acad. Management J.* 26(1) 5–26.
- Henderson, J. C., J. G. Sifonis. 1988. The value of strategic IS planning: understanding consistency, validity, and IS markets. *MIS Quart.* 12(2) 187–200.
- , N. Venkatraman. 1992. Strategic alignment: A model for organizational transformation through information technology. T. A. Kochan and M. Useem (eds.). *Transforming Organizations*. Oxford University Press, Oxford.
- Jarvenpaa, S. L., B. Ives. 1993. Organizing for global competition: The fit of information technology. *Decision Sci.* 24(3) 547–580.
- Johnston, H. R., S. R. Carrico. 1988. Developing capabilities to use information strategically. *MIS Quart.* 12(1) 37–48.
- , M. R. Vitale. 1988. Creating competitive advantage with inter-organizational information systems. *MIS Quart.* 12(2) 152–165.
- Karimi, J., Y. P. Gupta, T. M. Somers. 1996a. Impact of competitive strategy and information technology maturity on firms' response to globalization. *J. MIS* 12(4) 55–88.
- , —, —. 1996b. The congruence between a firm's competitive strategy and information technology leader's rank and role. *J. MIS* 13(1) 63–88.

- Ketchen Jr., D. J. J. B. Thomas, C. C. Snow. 1993. Organizational configurations and performance: A comparison of theoretical approaches. *Acad. Management J.* 36(6) 1278-1313.
- King, W. R. 1978. Strategic planning for management information systems. *MIS Quart.* 2(1) 27-37.
- , T. S. H. Teo. 1997. Integration between business planning and information systems planning: Validating a stage hypothesis. *Decision Sci.* 28(2) 279-308.
- , R. W. Zmud. 1981. Managing information systems: Policy planning, strategic planning, and operational planning. *Proc. Second Internat. Conf. Information Systems*, Boston, MA.
- Lederer, A. L., A. L. Mendelow. 1987. Information resource planning: Overcoming difficulties in identifying top management's objectives. *MIS Quart.* 11(3) 389-399.
- , ———. 1989. Coordination of information systems plans with business plans. *J. MIS* 6(2) 5-19.
- , V. Sethi. 1988. The implementation of strategic information systems planning methodologies. *MIS Quart.* 12(3) 445-461.
- Lorr, M., 1983. *Cluster Analysis for Social Scientists*. Jossey Bass Publishers, San Francisco, CA.
- Luftman, J., R. Papp, T. Brier. 1999. Enablers and inhibitors of business-IT alignment. *Comm. AIS* 1(11) 1999.
- McDaniel, S. W., J. W. Kolari. 1987. Marketing strategy implications of the Miles and Snow strategic typology. *J. Marketing* 51(4) 19-30.
- McKenney, J. L., R. O. Mason, D. G. Copeland. 1997. Bank of America: The crest and trough of technological leadership. *MIS Quart.* 21(3) 321-353.
- Meyer, A. D., A. S. Tsui, C. R. Hinings. 1993. Configurational approaches to organizational analysis. *Acad. Management J.* 36(6) 1175-1195.
- Miles, R. E., C. C. Snow. 1978. *Organizational Strategy, Structure, and Process*. McGraw-Hill, New York.
- , ———. 1984. Fit, failure, and the hall of fame. *California Management Rev.* 26(3) 10-28.
- , ———, A. D. Meyer, H. J. Coleman, Jr. 1978. Organizational strategy, structure, and process. *Acad. Management Rev.* 3(3) 546-562.
- Moore, G., I. Benbasat. 1991. Development of an instrument to measure the perceptions of adopting an information technology innovation. *Inform. Systems Res.* 2(3) 192-222.
- Nunnally Jr., J. C. 1978, *Psychometric Theory*. McGraw-Hill, New York.
- Niederman, Fred, James Brancheau, James Wetherbe. 1991. Information systems management issues for the 1990's. *MIS Quart.* 15(4) 475-495.
- Odom, R., W. F. Boxx. 1988. Environment, planning processes, and organizational performance of churches. *Strategic Management J.* 9 197-205.
- Papp, R. 1999. Business-IT Alignment: Productivity paradox payoff?. *Industrial Management and Data Systems* 99(7/8) 367-373.
- Porter, M. E. 1980. *Competitive Advantage*. Free Press, New York.
- . 1985. *Competitive Strategy*. Free Press, New York.
- Premkumar, G., W. R. King. 1994. Organizational characteristics and information systems planning: An empirical study. *Inform. Systems Res.* 5(2) 75-109.
- Raghunathan, B., T. S. Raghunathan. 1990. Planning implications of the information systems strategic grid: An empirical investigation. *Decision Sci.* 21(2) 287-300.
- Raghunathan, T. S., W. R. King. 1988. The impact of information systems planning on the organization. *OMEGA Internat. J. Management Sci.* 16(2) 85-93.
- Reich, B. H., I. Benbasat. 1996. Measuring the linkage between business and information technology objectives. *MIS Quart.* 20(1) 55-81.
- , ———. 2000. Factors that influence the social dimension of alignment between business and information technology objectives. *MIS Quart.* Forthcoming.
- Robinson Jr., R. B. J. A. Pearce, II. 1988. Planned patterns of strategic behavior and their relationship to business-unit performance. *Strategic Management J.* 9 43-60.
- Rotemberg, J. J., G. Saloner. 1991. Interfirm competition and collaboration. Michael S. Scott Morton, ed. *The Corporation of The 1990s: Information Technology and Organizational Transformation*. Oxford University Press, Oxford.
- Sabherwal, R., W. R. King. 1995. An empirical taxonomy of the decision-making processes concerning strategic applications of information systems. *J. MIS* 11(4) 177-214.
- , P. Kirs. 1994. The alignment between organizational critical success factors and information technology capability in academic institutions. *Decision Sci.* 25(2) 301-330.
- , D. Robey. 1993. An empirical taxonomy of implementation processes based on sequences of events in information system development. *Organ. Sci.* 4(4) 548-576.
- Sambamurthy, V., R. W. Zmud. 1999. Factors influencing information technology management architectures in organizations: A theory of multiple contingencies. *MIS Quart.* 23(2).
- Segars, A., V. Grover. 1998. Strategic information systems planning success: An investigation of the construct and its measurement. *MIS Quart.* 22(2) 139-163.
- Segev, E. 1989. A Systematic comparative analysis and synthesis of two business-level strategic typologies. *Strategic Management J.* 10 487-505.
- Shortell, S. M., E. J. Zajac. 1990. Perceptual and archival measures of Miles and Snow's strategic types: A comprehensive assessment of reliability and validity. *Acad. Management J.* 33(4) 817-832.
- SIM. 1996. Aligning technology and corporate goals is top concern. *SIM NETWORK*, xii(iii) 12.
- Simon, R. 1987. Accounting control systems and business strategy. *Accounting, Organ. Soc.* 12 357-374.
- Smith, K. G., J. P. Guthrie, M. J. Chen. 1989. Strategy, size, and performance. *Organ. Stud.* 10(1) 63-81.
- Snow, C. C., L. G. Hrebiniak. 1980. Strategy, distinctive competence, and organizational performance. *Admin. Sci. Quart.* 25 317-336.
- Suomi, R. 1988. Inter-organizational information systems as company resources. *Inform. Management* 15 105-112.
- Synnott, W. R. 1987. *The Information Weapon: Winning Customers and Markets with Technology*. John Wiley and Sons, New York.
- Thomas, H., N. Venkatraman. 1988. Research on strategic groups: Progress and prognosis. *J. Management Stud.* 25(6) 537-555.

- Tiryakian, E. A. 1968. Typologies. O. L. Sills, Ed. *International Encyclopedia of the Social Sciences*. Macmillan and Free Press, New York. 177-186.
- Ulrich, D., B. McKelvey. 1990. General organizational classification: An empirical test using the United States and Japanese electronic industry. *Organ. Sci.* 1(1) 99-118.
- Venkatraman, N. 1989a. Strategic orientation of business enterprises. *Management Sci.* 35(8) 942-962.
- . 1989b. The concept of fit in strategy research: Toward verbal and statistical correspondence. *Acad. Management Rev.* 14(3) 423-444.
- , J. E. Prescott. 1990. Environment-strategy coalignment: An empirical test of its performance implications. *Strategic Management J.* 11 1-23.
- , V. Ramanujam. 1986. Measurement of business performance in strategy research: A comparison of approaches. *Acad. Management Rev.* 11 801-814.
- Ward, J. H., Jr. 1963. Hierarchical grouping to optimize an objective function. *J. Amer. Statist. Assoc.* 58 236-244.
- Ward, J., P. Griffiths, P. Whitmore. 1990. *Strategic Planning for Information Systems*. John Wiley Series in Information Systems, Chichester, U.K.
- White, R. E. 1986. Generic business strategies: Organizational context and performance. *Strategic Management J.* 7.
- Wiseman, C. 1988. *Strategic Information Systems*. Irwin, Homewood, IL.
- Zahra, S. A., J. A. Pearce II. 1990. Research evidence on the Miles-Snow typology. *J. Management* 16(4) 751-768.
- Zajac, E., Shortell, S. M. 1989. Changing generic strategies: Likelihood, direction and performance implications. *Strategic Management J.* 10 413-430.
- Zviran, M. 1990. Relationships between organizational and information systems objectives: some empirical evidence. *J. MIS* 7(1) 65-84.

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