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# **IT Alignment with Business Strategies in Healthcare Organizations: An Empirical Analysis**

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## **ABSTRACT**

*This paper describes a study that assessed the performance implications of aligning information technology (IT) strategy to overall business strategy across a variety of health care organization (HCO) structures. We obtained survey results from senior executives of 178 hospitals to identify key configurations of IT strategic practices, business strategy and HCO structures. Using K-means cluster analysis, we identified which business strategies correlate strongly with certain IT strategy types. Our results indicate that HCOs achieve superior performance through unique combinations of business and IT strategy, suggesting that correctly aligning these strategies is a critical decision for healthcare organizations.*

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## **INTRODUCTION**

Researchers have long believed that the proper alignment of IT strategies and business strategies will lead to superior business performance (e.g., Chan, Huff, Barclay, & Copeland, 1997; Evans & Neu, 2008; Reich & Benbasat, 1996; Sabherwal & Chan, 2001). Strategic IT alignment is defined as the degree to which the mission, objectives and plans contained in the business strategy are shared and supported by the IT strategy (Chan, Sabherwal, & Thatcher, 2006; Reich & Benbasat, 1996; Jarvenpaa & Ives, 1993; Sabherwal & Chan, 2001), and prior researchers have reported that business performance is contingent upon the alignment between the firm's IS strategy, business strategy, and organizational structure (Brown & Magill, 1994; Jarvenpaa & Ives, 1993). However, organizations typically change their business strategies as they perceive significant changes taking place in their environment. One particular business environment, the healthcare industry, has experienced significant changes in the last twenty years (Marlin,

Huonker, & Hasbrouck, 2004). Accordingly, in this research we address an important yet unanswered question: Which combinations of IT and business-level strategies are best suited for optimizing performance in healthcare organizations?

The answer to this question is difficult to obtain, as least partially due to the recent complexity of the health care industry. The past quarter century has evidenced a period of great turbulence for the industry. In 1983, Medicare, which makes up over 40% of hospital admissions, switched from a cost-plus basis to fixed payments causing health care organizations to become more business-like, with increased focus on containing costs and acting strategically to gain and sustain competitive advantage (Zajac & Shortell, 1989). Since the initial shock, adaptation to this fundamental change has been ongoing, leading to increased competition and a highly turbulent environment (Marlin, Huonker & Hasbrouck, 2004). In reaction, Devers, Brewster and Casalino (2003) note that new medical and information technology has enhanced competitive intensity among managed care providers, and prospective reimbursement has led to additional increases in competition (Ginn & Lee, 2006). The unsettled environment has raised questions among healthcare industry leaders, policy makers, and payers regarding the efficacy of different healthcare organizational structures and the technologies facilitating their operation (Bazzoli, Shortell, Ciliberto, Kralovec, & Dubbs, 2001). In particular, the increased competitiveness of the industry has forced healthcare organizations (HCOs) to re-evaluate the ways they employ information technology to organize and strategically conduct business. Two areas of focus that are particularly important in this regard are the adoption and execution of business-level strategy, and the related strategic management of information technology that serves to support such decision making.

Drawing from the business strategy and strategic information technology (IT) literatures, the research reported here empirically investigated whether different configurations of business strategy and IT strategy lead to different levels of performance within different HCO structures. The article is organized as follows. First, business strategy options and information strategy options, the key variables in this study, are reviewed. This discussion is followed by an assessment of alternative health care organization structures, and the theoretical foundation for the study is presented. These sections are followed by a description of the research study, discussion of results, implications, limitations, and directions for future research.

## **BACKGROUND LITERATURE**

### ***Business Strategy***

The most widely cited business strategy classification in health care research is the Miles and Snow (1978) typology (Ginn, Young, & Beekun, 1995; Dent, 1990; Shortell & Zajac, 1990). Miles and Snow (1978) used hospitals as one of several research settings when generating their seminal typology, which is commonly used in strategy research to categorize different approaches to gaining and/or sustaining competitive advantage. Shortell and Zajac (1990) validated and assessed the reliability of the Miles and Snow typology in the health care organizational context, finding it to be sufficiently robust for analysis of healthcare organizational forms. Zahra and Pearce (1990) also noted the widespread acceptance of the Miles and Snow typology in strategic information systems research based on their examination

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of 17 empirical investigations of the Miles and Snow typology. Thus, the Miles and Snow typology is thought to be an appropriate foundation for describing the interconnections between business strategy, IT, and HCO structures.

Miles and Snow's typology (1978) identified four general approaches to business strategy. In the research study reported here we employ the first three of these approaches. These are: Prospector (*continually search for new markets and are frequently the first to market with a new service*), Defender (*focuses on a particular market to create a stable set of products and customers and focus on efficiency and low cost*), and Analyzer (*an intermediate strategy between defender and prospector using a defender strategy to protect some markets and fast follower into new markets and new services*). Though Miles and Snow's fourth category, the Reactor strategy, was included in the initial typology as a viable strategic choice for business organizations, subsequent research has shown that the Reactor actually represents a lack of business strategy, or characterizes an organization in transition from one strategy or another (Zahra & Pearce, 1990), and so the Reactor strategy is frequently removed from consideration in modern strategy research. In the current study, we follow this precedent.

The three remaining Miles and Snow (1978) strategies (prospector, defender, and analyzer) are generally thought to be viable in any industry context, and each can lead to organizational success. For example, Zahra and Pearce (1990) found that prospectors, defenders and analyzers tend to achieve statistically equal firm-level performance on average. However, results from further testing do indicate that industry context matters when choosing a business strategy to pursue. Hambrick (1983), for example, in evaluating the prospector, defender and analyzer strategies across multiple industries, found that being either a prospector or a defender led to lower ROI than being an analyzer in mature non-innovative industries, and that a defender strategy produced higher ROI than a prospector strategy in all industries except highly innovative industries. This issue is particularly salient in the case of the health care industry, in which competitors gain and sustain competitive advantage for the short- to medium-term by adopting or creating medical innovations. In highly innovative industries, a prospector strategy has been found to be associated with greater market share and thus is often considered to be more successful than a defender or analyzer strategy (Hambrick, 1983), and thus we would expect similar results in the current study.

### ***Information Technology Strategy***

Unlike business strategy, organizations tend to be polarized in their views regarding IT strategy. Some view IT as a necessary cost that must be managed and contained, while others view IT as a strategic resource that can potentially be exploited to create business value for the firm (Earl & Feeny, 1994; Evans & Neu 2008; Lai et al., 2008). Though IT strategy has been conceptualized in multiple ways, we follow leading scholars in defining it as the shared aspired state of the role that IT should play in the organization (e.g., Robbins & Duncan, 1988; Zmud, 1988; Armstrong & Sambamurthy, 1999). Based on this definition, prior research has identified three differential types of IT strategy, each representing a distinct vision of the role of IT within the organization along with supporting activities. These strategies are commonly known as automate, informate (down/up), and transformate strategies (Scott-Morton, 1991; Schein, 1992). Firms that adopt an automate strategy view IT as a substitute for human labor that can reduce operating costs. Firms

that adopt an informate-up approach view IT as a means to supply information to management in order to provide a more clear understanding of the state and dynamics of the business, while firms that hold an informate-down vision wish to provide the operational level workforce valued information such that they gain greater insights into their own activities. Alternatively, a firm with a transformate strategy believes that the role of IT is to fundamentally alter the organization by leveraging IT capabilities to develop new products or services, or otherwise change the firm's broader strategic direction.

It is important to note that prior research has not positioned IT strategy as a fixed, static firm level orientation, but rather as an evolutionary process that entails firms progressing from automate to informate and finally to transformate. The organization's IT strategy can therefore be viewed as the degree to which the role of IT plays a transformative role (Scott-Morton, 1991). Adopting this perspective, an automate strategy represents a cost control mechanism in which IT has little transformative power on organizational outcomes. At the opposite end of the perceptual spectrum, a transformate strategy leverages IT as a key critical resource that can potentially provide competitive advantage (Armstrong & Sambamurthy, 1999). Between these extremes, an informate (down/up) vision represents an intermediate or moderate level of transformative capability (Chatterjee, Richardson, & Zmud, 2001).

Given that broad strategic business initiatives such as those for strategic IT depend largely on the structure of the organization, and that healthcare was the focal industry in this study, we next turn to a discussion of healthcare organizational structures.

### ***Healthcare Organization Structures***

Two broad types of HCOs that the American Hospital Association (AHA) has monitored since 1994 are health networks and health systems (Bazzoli et al., 2001). Health networks are strategic alliances of hospitals and other health organizations such as nursing homes and home health agencies that have two or more strategic business units and plural ownership. Health systems also offer a range of health care services, but the key distinction is that there is unified asset ownership, even with multiple affiliated hospitals. Based on these initial categories, a number of taxonomies have been developed attempting to characterize HCOs according to their common structural characteristics. One such taxonomy that has gained broad acceptance in the health care industry was developed by Bazzoli, Shortell, Dubbs, Chan and Kralovec (1999). Using 1994-95 AHA annual survey data, the authors identified three conceptual dimensions useful for classifying HCOs: differentiation, integration and centralization (Bazzoli et al., 1999). Differentiation refers to the HCO's ability to provide the appropriate number and type of services and programs throughout the continuum of care. Integration refers to the HCO's ability to "pull the pieces together" in order to maximize the value of the services provided (Bazzoli et al., 2001). Centralization/decentralization of decision making (McKelvey, 1975) has implications for the speed with which decisions are made, and subsequent accountability to various stake holders.

Several researchers have identified these three dimensions as being important in delivering health care and hospital services, physician arrangements and insurance products (c.f. Robinson, 1996; Bazzoli et al., 2001). Using differentiation, integration and centralization in the context of

hospital services, physician arrangements and insurance products, the Bazzoli et al. (2001) taxonomy included the following five categories of HCO structures:

- 1) Centralized system (health services and physician arrangements);
- 2) Decentralized system (health services and physician arrangements);
- 3) Moderately Centralized (centralized activity in selected health services and physician arrangements);
- 4) Centralized activity in physician arrangements but decentralized activity in hospital services; and
- 5) Independent hospital systems (little centralization of health services and physician arrangements).

This original Bazzoli et al. (1999) taxonomy was examined using 1998 AHA data and found to be reliable and robust, capturing the great majority of HCO structures (Bazzoli et al., 2001). However, no research has yet investigated which business-level strategies are most appropriate for particular HCOs structures adopting each structural form, and how information technology could best support such HCO - business strategy combinations. In general, the aforementioned business, IT and HCO structures are used together by healthcare firms in differing combinations with the simultaneous goals of maximizing patient service levels and profitability. In order to assess which alignments of business-level strategies and IT may generate competitive advantages across the five HCO forms, we rely on the key postulates of configuration theory.

### **THEORETICAL UNDERPINNING FOR THE STUDY**

The important question addressed in the research reported here is, “which combination of IT and business strategies produce superior performance in various categories of healthcare organizations?” Configuration theory is an appropriate theoretical framework for examining this question because it is based on the notion that certain categories of business strategies fit better with functional level firm attributes or tactical strategies (i.e., marketing, human relations, finance, compensation) with some combinations yielding greater sustainable competitive advantage (Meyer, Tsui & Hinings, 1993; Miller & Mintzberg, 1988). Configuration theory posits that for each set of strategic characteristics, there are bundles of organizational characteristics that yield superior performance (Drazin & Van de Ven, 1985). Within this theoretical stream the concepts of “fit” and “congruency” are established, describing how the alignment of organizational attributes generates firm advantages (Balkin & Gomez-Mejia, 1990; Doty, Glick and Huber, 1993). For instance, early theorists such as Burns and Stalker (1961), Woodward (1965), and Lawrence and Lorsch (1967) reported a connection between organizational alignment and performance, and Powell (1992) subsequently found that “some organizational alignments generate supernormal profits to the firm, and constitute an important source of competitive advantage (p. 128).” More recent configurational research has shown that the choice of appropriate functional strategies contributes to the effectiveness of business strategies (e.g., Delery & Doty, 1996; Miller, 1997; Slater & Olson, 2001; Veliyath & Srinivasan, 1995; Vorhies & Morgan, 2003; Olson, Slater, & Hult, 2005). In one particularly salient modern advancement, Vorhies and Morgan (2003) noted that some configurations are ideal because they represent complex “gestalts” of multiple, independent, and mutually reinforcing organizational characteristics that help organizations achieve their strategic goals.

With respect to the role of IT in organizations, Armstrong and Sambamurthy (1999) suggest that the configuration perspective is an appropriate lens through which to assess the efficacy of specific IT strategies. IT strategy researchers have recently argued that it is essential to examine not only the direct link between IT investments and firm performance, but also to explore the organizational conditions (i.e., configurations) that allow such investments to positively impact firm performance (Dehning, Richardson, & Zmud, 2003). However, though different IT strategies have long been thought to combine differentially with business level strategies in generating performance gains (e.g., Ein-Dor & Segev, 1982; Hitt & Brynjolfsson, 1997; Sambamurthy & Zmud, 1999), efforts to identify specific IT and business strategy configurations that are advantageous for healthcare organizations have yet to be identified in the literature.

Prior research supports an alignment between business and IT strategies as leading to higher levels of organizational performance (Chan et al., 2006; Lederer & Mendelow, 1989; Sabherwal & Chan, 2001; Sasidharan, Wu, Pearce, Kearns, & Lederer, 2006; Chen, Monahan & Feng, 2009). Thus, in the current study, we posit that the alignment between the business strategy and strategic role of IT within the organization will influence organizational performance of HCOs depending on the organizational form the HCO has adopted. This possibility has already been alluded to by Tan (1995), who in an initial examination found the degree to which IT is considered a strategic resource in formulating business strategy is contingent upon the business strategy that is adopted by the firm.

Specifically, Tan (1995) argues that the degree to which IT is viewed as a strategic resource determines if the role of IT is to increase operational efficiency for the firm, support the business strategy, or shape and transform the business strategy. The results of Tan's (1995) study indicate that organizations that pursue a more aggressive business strategy should have a corresponding level of IT responsiveness. As such, prospectors were observed to view IT of greater strategic importance than analyzers and analyzers viewed IT as more strategic than defenders. The key dimension underlying the Miles and Snow typology is the rate at which an organization changes its products or markets (Tan, 1995). Therefore, organizations that rapidly change their products and markets will need strategic IT resources that can help shape and transform the organization. Other researchers have recently argued that firms with aggressive business strategies that seek to develop high rates of growth are most suitable for such transformative IT initiatives (Oh, Kim, & Richardson, 2006).

However, the optimal linkage between business and IT strategies in the healthcare industry should vary according to the type of HCO. Because there was scant evidence in the literature to suggest what combinations of business strategy and IT strategy are best linked to a given HCO structure in order to produce superior outcomes, we conducted empirical analyses to explore this question.

## **METHODS**

### ***Sampling and Data Collection***

To assess the aforementioned issues, we conducted a field study to collect data from business executives regarding perceptions of their organization's business strategy, IT strategy, healthcare organizational structure, and their organization's performance relative to other hospitals. The

construction of a survey instrument was undertaken, following the three major headings in our Background Literature section. The theoretical foundation guiding this approach was configuration theory as described earlier in this paper.

The questionnaire contained a number of existing, validated instruments adapted to the current context. Where validated scales did not exist, new items were created following standard instrument development procedures. All constructs were measured using multi-item scales. The items and scales used to measure these constructs are included in the Appendix. The questionnaire was validated through a two-step process. First, semi-structured interviews were held with three business executives to assess content validity and to gain richer insights into the phenomenon. Second, the psychometric properties of the scales were statistically assessed, where applicable.

A total of 1,060 surveys were sent to a list of business executives from healthcare organizations listed in the American Hospital Directory (AHD). The contact information for these executives was derived from the AHD, several professional industry associations, and the corporate websites of the healthcare organizations. The surveys were then electronically distributed to these business executives. A total of 195 surveys were returned for a total response rate of 18.4%. A total of 17 of the 195 respondents were employed by corporations that did not fit our definitional requirement as a health care organization and as such were dropped yielding 178 organizations for use in this study. Of the 178 healthcare organizations, we classified 162 organizations as hospitals and 16 as medical centers/clinics. Respondents were mostly senior organizational executives. In our sample 84 (47.2%) of the respondents were CEOs, 26 (14.6%) were other C-level executives (CFOs, COOs, chief medical officers [CMOs]), 45 (25.6%) were senior executives/administrators, and 23 (12.9%) were characterized as senior managers/directors.

While the achieved response rate was typical for a survey of business executives (Ferratt, Agarwal, Brown, & Moore, 2005), researchers employing survey designs should appropriately test for non-response bias. This was accomplished by comparing the mean responses for each of the key measures between early and late respondents using ANOVA, since late responders have been shown to be similar to non-responders (Armstrong & Overton, 1977). In addition, we compared the mean annual sales and mean total number of employees for the 178 responding organizations to that of all non-responding organizations within the same healthcare industry (i.e., via all listed firms in the AHD and the primary NAICS code for healthcare organizations listed in the Dun & Bradstreet Million Dollar Database). The results of this process revealed no significant differences between early and late respondents on any of the measures in the study or between responding and non-responding organizations. These results suggest that responding organizations are representative of other firms in the same industry.

### ***Operationalization of Study Variables***

*Business Strategy* is defined as the way in which an organization seeks to achieve success by providing its healthcare services within its market domains. The measures for business strategy were based on the Miles and Snow (1978) typology using self-typing paragraphs. The survey provided descriptions, in paragraph form, of the prospector, defender, and analyzer strategies. These descriptions were shaped to fit the context of the healthcare organizations within our



sample which provide healthcare services rather than produce tangible goods. The respondent was asked to: 1) indicate the extent to which each paragraph describes their organization's business strategy (seven-point scale); and, as a check, 2) indicate which best characterizes their organization. In the classification of the organizations most characteristic strategy, the respondents were also given the option to indicate that none of the prospector, defender, or analyzer best characterized their organization's business strategy. This is indicative of a reactor strategy. The self-typing paragraphs for the business strategy, IT strategy, and healthcare organizational types are shown in the Appendix.

*IT Strategy* is defined as the strategic role of IT within the organization. IT strategy was operationalized in accordance with three strategic roles derived from prior IT research (Schein, 1992; Armstrong & Sambamurthy, 1999; Chatterjee, Richardson, & Zmud, 2001): automate, informate, and transformate. The respondents were provided descriptions of each IT strategy and asked to: 1) indicate the extent to which each paragraph describes their organization's IT strategy (seven-point scale). As a check, respondents were also asked to indicate which one best characterizes their organization's IT strategy.

*Healthcare Organizational Type* is defined as the way in which a firm organizes its health services and physician arrangements. The respondents were provided descriptions of each organizational type and asked to: 1) indicate the extent to which each paragraph describes their organization's practices (seven-point scale); and 2) indicate which one best characterizes their organization overall.

*Organizational Performance* was defined as the financial and operational performance of the organization with respect to industry competitors. Organizational performance measures included the following: market share, profitability, sales revenue, sales growth, worker productivity, cost containment, service quality, and delivery service. The selection of these measures was derived from prior healthcare studies that examined the financial and operational performance variables that are relevant to hospitals (Li & Collier, 2000). Respondents were asked how their firm compares to other firms within their industry with respect to these performance measures using a seven-point scale.

### ***Cluster Analysis***

Most all previous configuration studies have employed cluster analysis as a means for identifying which formations of organizational elements constitute optimal alignment across sample members (Vorhies & Morgan, 2003). We thus adopted an inductive configuration approach using cluster analysis, consistent with several previous organizational IT studies (e.g., Sharma & Yetton, 1996; Lee, Chen, & Weiner, 2004; Ferratt, Agarwal, Brown, & Moore, 2005). We based the configuration analysis on the three sets of strategy and organizational variables captured by the survey, i.e., the seven point scales reflecting the organization's implemented business strategy and IT strategy, as well as the HCO structure. The induction from data as executed herein reflects a taxonomic approach, with cluster outcomes representing unique and different organizational resource configurations being implemented in the health care industry as vehicles for achieving competitive advantage.

Organizational configurations were identified using a two-step clustering procedure. In the first stage, cluster seeds were identified that would be likely to exhibit differences across the variety of organizational performance measures. Specifically, Ward's method with squared distances was employed to simultaneously minimize internal differences and allay concerns related to chained observations. Examination of agglomeration coefficients indicated a three or four cluster solution was likely to be optimal. Nonhierarchical clustering was then executed as the second step for the three and four cluster solutions. Sensitivity analyses conducted on the two models indicated a greater proportion of variance explained in organizational performance (summed) for the three-cluster model, and thus a three-configuration solution was adopted for the remainder of the study.

## RESULTS AND DISCUSSION

**Table 1: Performance Outcomes for the Three Clusters.**

| Performance Outcome | Cluster |      |        |
|---------------------|---------|------|--------|
|                     | 1       | 2    | 3      |
| Market Share        | 5.37*   | 4.87 | 4.68** |
| Profitability       | 5.32*   | 4.79 | 4.33** |
| Sales Revenue       | 5.29*   | 4.67 | 4.21** |
| Sales Growth        | 5.08*   | 4.58 | 4.10** |
| Worker Prod.        | 5.01    | 4.79 | 4.70   |
| Cost Contain.       | 4.73    | 4.83 | 4.66   |
| Service Quality     | 5.88*   | 5.46 | 5.27** |
| Delivery Service    | 4.95*   | 4.80 | 4.22** |

As Table 1 illustrates, Cluster 1 had the highest performance outcome on six of the eight measures that we tested. Two of the measures, worker productivity and cost containment, did not have significant results for any of the three configurations, and therefore, were not analyzed. Cluster 2 had intermediate performance outcomes and Cluster 3 had the lowest performance outcomes on six of the eight measures. The next section explores possible reasons why health care organizations in each of these clusters had significant differences in performance outcomes. There were very few respondents that identified themselves as HCO2 or HCO4 which led us to only include HCO1, HCO3 and HCO5 in the final analysis.

### *Cluster 1*

Cluster 1 is the largest identified cluster, representing 50% of the sample. The majority of the respondents utilize an informate IT strategy closely followed by a transformate IT strategy. The informate IT strategy is the most common IT strategy in all three clusters and, as noted previously, can be considered an intermediate strategy between automate and transformate. Automate emphasizes the use of IT as a cost control mechanism while transformate emphasizes utilizing IT as a critical resource that can provide competitive advantage. The majority of the organizations that utilize a transformate strategy can be found in cluster 1. Previous researchers have noted the relationship between environmental uncertainty and the utilization of a

transformate IT strategy (Choe, 2003). Healthcare organizations that perceive a lot of uncertainty in the marketplace might seek to leverage their IT capabilities.

As Table 2 illustrates, Cluster 1 also contains the largest percent of firms that utilize the prospector business strategy. Healthcare organizations that utilize a prospector business strategy are continually searching for new markets and are frequently the first to market with a new service. A prospector business strategy is more successful in those environments where the marketplace emphasizes innovation. Cluster 1 also contains healthcare organizations that utilize a defender and an analyzer business strategy. The defender business strategy emphasizes low cost and efficiency, protecting a particular market, which can be ideal in a stable market. An analyzer business strategy is the intermediate strategy between prospector and defender and can be ideal in a mature non-innovative market.

**Table 2: Summary of the Cluster Profiles.**

| Business Strategy | Prospector |           |           | Analyzer |           |          | Defender |           |          |
|-------------------|------------|-----------|-----------|----------|-----------|----------|----------|-----------|----------|
|                   | A          | I         | T         | A        | I         | T        | A        | I         | T        |
| IS Strategy       | A          | I         | T         | A        | I         | T        | A        | I         | T        |
| HC1               | -          | <u>8</u>  | <u>3</u>  | <u>2</u> | <u>13</u> | <u>7</u> | <u>1</u> | <u>12</u> | <u>1</u> |
| HC3               | -          | <b>18</b> | <b>10</b> | <b>4</b> | <b>18</b> | <b>3</b> | <b>1</b> | <b>9</b>  | <b>5</b> |
| HC5               | -          | <b>7</b>  | <b>5</b>  | -        | 8         | 5        | -        | <i>12</i> | <i>7</i> |

Bold = Cluster 1; Underline = Cluster 2; Italic = Cluster 3

Cluster 1 contains HCO3 (85%) which is moderately centralized and HCO5 (15%) which is independent or not centralized. Healthcare organizations that are centralized tend to emphasize cost control and standardized decision making. Independent healthcare organizations tend to be more willing to take risks, without as much need to have standardized low cost options. They are more likely to emphasize innovation and adapting quickly to local changes in the environment. This would suggest organizations that are moderately centralized or independent would have better performance with a transformative IT strategy and a prospector business strategy. Healthcare organizations that are more willing to take risks in an innovative, uncertain environment and utilize their IT strategy to transform their organizations would likely have better performance.

### *Cluster 2*

Cluster 2 is next in size making up about 30% of the total sample. Healthcare organizations in this cluster have intermediate performance outcomes in comparison to the other clusters. The majority of the organizations in this cluster utilize an informate strategy which is an intermediate strategy between the cost focus of automate and the leverage focus of a transformate IT strategy. In terms of business strategy, the majority of health care organizations in this cluster employ an analyzer business strategy which can be considered an intermediate strategy between defender and prospector that relies on protecting particular markets but a fast follower into new markets

and new services. In terms of health care organizations, this cluster only contains HCO1 which emphasizes a centralized system that can be broadly categorized as focusing on minimizing risk. Centralizing decision making will likely lead to a slower but more consistent response especially when the focus is on reducing costs. This organizational arrangement is ideal in a stable, highly regulated environment where demand, revenue and expense are highly predictable. The lower performance outcome in this cluster could indicate that the current healthcare environment is more uncertain and that a more aggressive risk taking strategy might lead to better performance outcomes. Another problem that health organizations in cluster 2 face is the lack of alignment among organization structure and the type of IT strategy and business strategy. This cluster, with its emphasis on centralized decision making, would likely benefit from an automate IT strategy and a defender business strategy as they both emphasize controlling costs and minimizing risk.

### ***Cluster 3***

Cluster 3 is the smallest cluster with only 20% of the sample. It also has the lowest performance outcomes. The majority of the healthcare organizations in this cluster employ a defender business strategy and an informate IT strategy. The defender business strategy focuses on efficiency and low cost by relying on a stable set of products and customers. The IT strategy that would be most aligned with the defender strategy would be an automate IT strategy that also focuses on a cost control perspective where IT has little transformative power on organizational outcomes. However, having no organizations utilizing an automate strategy in this cluster would likely lead to lower performance with the misalignment between business strategy and IT strategy.

This cluster contains only HCO5 which are organizations that are independent hospital systems. Interestingly HCO5 organizations that were in Cluster 1 had much higher performance suggesting the alignment of business strategy; IT strategy and healthcare organizational structure would lead to better business performance. Therefore this cluster was misaligned in terms of business strategy, IT strategy and HCO structures.

## **RESEARCH IMPLICATIONS**

The research reported here revealed that healthcare organizations in Cluster 1 outperformed those in Clusters 2 and 3. One reason for the greater performance in cluster 1 is the alignment between business strategy and IT strategy. If this is the case, why would healthcare organizations ever organize such as in cluster 2 or cluster 3? It could be that health care organizations in Clusters 2 and 3 did not actively select a strategy that was not successful but instead have not been as quick to change when the environment changed. What is the level of choice that health care organizations have in terms of selecting the business strategy, IT strategy and the level of centralization in the short-to- intermediate term? In other words, it could be that all healthcare organizations started out in Cluster 3, which is a defender business strategy, automate IT strategy and centralized organization. This was probably an ideal configuration in the mature, stable and highly regulated cost plus environment of the 1980's. Successful healthcare organizations adapted to the changing environment and moved to Cluster 1.

If the environment changes drastically, such as the method of reimbursement for healthcare costs changed over the past two decades, then there is much more uncertainty and some firms may be more willing to take more risk to be more successful. The clusters may be a reflection of different health care organizations' ability and willingness to adapt to changes in their marketplace. This would suggest that healthcare organizations in Cluster 3 are still relying on strategies that were ideal in a stable environment before there was a radical shift in terms of Medicare reimbursements. Healthcare organizations in Cluster 2 have recognized the greater uncertainty in the environment and have started to make changes in terms of going to an analyzer business strategy, an informate IT strategy and less centralization of physician and hospital services. Healthcare organizations in cluster 1 have further adapted to the changing environment by utilizing a prospector business strategy, a transformate IT strategy, and moderately centralized or independent HCO structures, and thereby have achieved the best performance.

### **LIMITATIONS**

This research study attempted to assess the performance implications of aligning information technology strategy to overall business strategy across a variety of health care organization (HCO) structures. Given such a complex task the research findings have inherent limitations. The most significant limitation is associated with a health care taxonomy that is necessarily broad in its approach. Having a category that included selected health services and physician services as centralized did not allow us to identify which specific services were centralized. Clearly different health care organizations could have centralized different services yet be found in the same category. However, this taxonomy is well established in the health care industry and has been found to be robust and practical. A second limitation is defining IT strategy as the shared aspired state of the role that IT should play in the organization. Clearly there are many additional constructs in the literature that could further define IT strategy such as IT responsiveness, IT structure or IT complexity. However, this research was seeking a broad general approach. Future research could utilize additional IT constructs to further increase granularity of the level of IT strategy used by the healthcare organization. Another limitation is that alignment between these three strategies may be an emergent process over time which suggests that a longitudinal study instead of a cross-sectional study might provide a deeper understanding of the relationships between the three types of strategies studied.

Finally this research relies on surveys to collect data, which is always subject to possible response bias when using a single informant in each organization. Ideally, multiple informants and multiple sources of data from the same organization would provide a more accurate understanding of the healthcare organizations being studied. However, considering the respondents are primarily C- level executives, it is likely that these are the only individuals who would be able to provide valid and accurate data on their specific organizations, business strategy, IT strategy, organizational structure and business performance.

### **CONCLUSION**

Our survey of 178 business executives of hospitals and health care systems assessed key configurations of information technology strategic practices, business strategy and HCO structures, identifying the value of correctly aligning the business strategy, the IT strategy and

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HCO structures. Though the type of HCO was not directly associated with superior performance a misalignment of the IT and business strategies within particular HCO structures were shown to lead to an overall reduction in business performance.

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## APPENDIX

### BUSINESS STRATEGY

Please read each Business Strategy description and indicate the extent to which it describes your organization's business strategy (based on the following scale): Scale: 1 to 7: 1 (does not describe at all); 4 (somewhat describes); 7 (completely describes)

Business Strategy 1: Our organization is frequently the first to market with a new healthcare service. We do not hesitate to enter new market segments in which there appears to be an opportunity. We concentrate on offering healthcare services that push performance boundaries. Our proposition is to offer the most innovative healthcare service, whether it is based on substantial performance improvement or cost reduction.

Business Strategy 2: Our organization is seldom first-in with new healthcare services or first to enter emerging market segments. However, by monitoring market activity, we can be early followers with a better targeting strategy, increased patient benefits, or lower total costs.

Business Strategy 3: Our organization attempts to maintain a relatively stable domain by aggressively protecting our market position. We are rarely at the forefront of healthcare service development; instead, we focus on producing healthcare services as efficiently as possible. In general, our firm's focus is on increasing share in existing markets by providing healthcare services at the best prices.

Which of the 3 Business Strategies best characterizes your organization? Please choose one:

- Business Strategy 1;
- Business Strategy 2;
- Business Strategy 3;
- None of the Above.

### IT STRATEGY

Please read each Information Technology (IT) Strategy description and indicate the extent to which it describes your organization's IT Strategy (based on the following scale): Scale: 1 to 7: 1 (does not describe at all); 4 (somewhat describes); 7 (completely describes)

IT Strategy 1: My organization's IT strategy is to replace human labor by automating business processes.

IT Strategy 2: My organization's IT strategy is to provide data and or information to empower management and employees.

IT Strategy 3: My organization's IT strategy is to fundamentally alter traditional ways of doing business by redefining business processes and relationships.

Which of the 3 IT Strategies best characterizes your organization? Please choose one:

- IT Strategy 1; • IT Strategy 2; • IT Strategy 3; • None of the Above.

### **ORGANIZATIONAL CATEGORY**

Please read each of the following categories and indicate the extent to which it describes your organization (based on the following scale): Scale: 1 to 7: 1 (does not describe at all); 4 (somewhat describes); 7 (completely describes)

Category 1: My organization centrally organizes health services and physician arrangements.

Category 2: My organization is characterized by a high degree of decentralization of both health services and physician arrangements.

Category 3: My organization has centralized activity in selected health services and physician arrangements but also simultaneously has decentralized activity in both.

Category 4: My organization has centralized activity in physician arrangements but has decentralized activity in hospital services.

Category 5: My organization maintains a high level of autonomy from the health network/system with regard to health services and physician arrangements.

Which of the 5 Categories best characterizes your organization? Please choose one.

- Category 1; • Category 2; • Category 3; • Category 4; • Category 5.

### **ORGANIZATIONAL PERFORMANCE**

How does your hospital compare to other hospitals with respect to performance (based on the following scale): Scale: 1 to 7:

1 (much worse than the competition); 4 (equal to the competition); 7 (much better than the competition)

- Market Share; • Profitability; • Sales Revenue; • Sales Growth; • Worker Productivity; • Cost Containment; • Service Quality; • Delivery of Services.