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TRANSFORMATIONAL FOCUS IN STRATEGIC IT VISION: AN INDUSTRY-LEVEL CONCEPTUAL MODEL

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ABSTRACT

It has recently been argued that the IT literature has neglected to sufficiently focus on the importance of the influence that industry factors have on a firm's IT strategy and IT management practices, in short – industry matters. (Chiasson & Davidson, 2005) Strategic IT Vision (SIV) has been studied at the firm level for many years. The categories Automate, Informate & Transform have been used to categorize the Strategic IT Vision of firms for more than 20 years. At the same time, some have suggested that SIV can be observed at the industry level in that, at a given time, the firms within an industry exhibit a certain amount of homogeneity of IT strategy and vision. What industry factors might lead to the adoption of a particular SIV by its firms? This paper develops a conceptual framework of industry factors that can be theorized to lead to a greater transformative nature of the SIV of a particular industry.

INTRODUCTION

Over the past 40 years, Information Technology has become a key component of business strategy across nearly every industry. Information technology is constantly evolving, becoming more powerful and creating more opportunities to be used to assist in business transactions and transformation. Computing power continues to increase at an exponential rate, making more complex systems economically feasible and available to a wide range of companies. Increases in modularity of software and generality of hardware minimize the costs of IT system changes. The increase in the digital representation of artifacts reduces the need for physical artifacts, enables ever-increasing use of information technology for the completion of processes and for mediation, and expands the possibilities for IT to be used in continually more innovative and transformative ways. (Dhar & Sundararajan, 2007) These evolutionary and revolutionary developments in technology are available in a practical sense to firms in all industries at an equivalent rate, yet some firms seem to embrace the opportunities provided by these advancements, while others do not. The Strategic IT Vision (SIV) of a firm frames both the way in which a firm views the value created by IT, and the ways in which IT is used to further the strategic goals of the firm, and the ways in which firms view the adoption of technological innovations. From this perspective, SIV is a firm level construct.

However, industries have also been observed to exhibit a dominant Strategic IT Vision. (Anderson, Banker, & Ravindran, 2000) It is intuitive that the firms in a particular industry would tend to embrace similar SIVs, but what is not necessarily intuitive is why industries may exhibit a SIV that focuses on IT as automation, versus a SIV that focuses on using IT to transform. In general, the literature regarding SIV has focused on descriptive statements – specifically that industries tend to exhibit a level of homogeneity in SIV; theoretical models that describe how industry factors affect SIV or how these factors may affect the homogeneity of SIV within an industry have not been well developed.

Additionally, it has recently been argued that the IT literature has neglected to sufficiently focus on the importance of the influence that industry factors have on a firm's IT strategy and IT management practices, in short – industry matters. (Chiasson & Davidson, 2005)

This paper develops a conceptual framework of industry factors that can be theorized to lead to a greater transformative nature of the SIV of a particular industry.

THEORETICAL BACKGROUND AND MODEL

Early business IT deployment efforts centered on automation, namely the replacement of human workers with IT systems. However, as we approached the 21st Century, IT was increasingly seen as a vehicle for transforming business. Initial IT investments focused on automation led to unforeseen effects, namely the automation led to the creation of large volumes of information. (Zuboff, 1985) This newly created information enabled additional sense-making regarding the automated processes, and the information could be used both to empower the workers now tasked with operating the automated systems, and to provide new detailed information to management regarding efficiency of the system, and status. (Zuboff, 1985) Further, the IT itself was described as possessing a fundamental nature that determined whether the IT was of the automate or informate type (Zuboff, 1985).

Recognizing the importance of complementary business process modifications to IT implementation success (Melville, Kraemer, & Gurbaxani, 2004), later research shifted its conceptualization from an inherent strategic nature of a particular technology, to the Strategic IT Vision (SIV) that a firm would exhibit at a point in time. (Schein, 1989)

Strategic IT Vision (SIV) has been studied at the firm level for many years. (Armstrong & Sambamurthy, 1999; Schein, 1989; Zuboff, 1985) While SIV is related to the IT moves that a firm makes, the SIV itself is distinct from the moves. The SIV affects both the firm's conceptualization about the nature of IT, as well as its application within the firm, and can be thought of as the anticipated dominant strategic outcome enabled by a firm's IT moves. SIV has been shown to be affected by a number of factors, including characteristics of the CIO, Top Management Team (TMT), and overall business strategy. (Armstrong & Sambamurthy, 1999; Schein, 1989)

At any one time, a firm exhibits one of four Strategic IT Visions: Automate, Informate down, Informate up, and Transform. (Armstrong & Sambamurthy, 1999; Chatterjee, Richardson, & Zmud, 2001; Dehning, Richardson, & Zmud, 2003; Schein, 1989; Zuboff, 1985). A brief description of each of these visions is described in Table 1:

Vision	Summary
Automate	IT is seen as a means to reduce costs by replacement of inefficient and unreliable human labor with technology. IT is generally viewed as a capital replacement for labor costs.
Informate Down	IT is seen as a means to empower workers, giving them additional information with which to make decisions about how and what they should do.
Informate Up	IT is seen as a means to provide information to management to allow greater visibility and control of business processes and transactions.
Transform	IT is seen as a means to fundamentally transform a firm's relationship with its partners and customers. Additionally, IT is seen as an enabler for the transformation of the firm itself – its products, procedures, & processes.

Table 1: Adapted from Schein. (Schein, 1989)

However, SIV has also been described as fluid and progressive over time. Firms begin with a vision of Automate, and evolve over time toward Transform. (Farrell, 2003; Scott Morton, 1991) This evolutionary, directional progression suggests a Strategic IT Vision Continuum, where a firm's SIV may

be described at a given point in time as being at any point along the progression. Firms (and industries to which they belong) begin with the more simple, automate SIV, realize the benefits and opportunities of this SIV, and tend to move through informate toward a transform SIV. This continuum is depicted in figure 1.

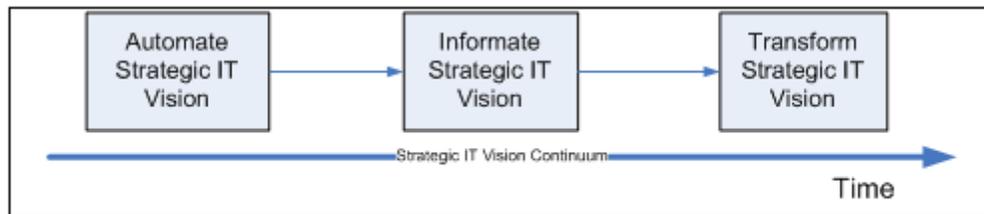


Figure 1: Strategic IT Vision Continuum

There is some support for this in the literature, specifically in the banking and financial services industries. Chatterjee (Chatterjee et al., 2001) categorized both banking and financial services as being characterized by the Automate SIV between the years of 1987 and 1994. However, Elliott (Elliot, 2006) characterizes the same industries as being dominated by a Transform SIV between the years of 2000 and 2006.

Even if a firm moves toward a more transformational SIV, this does not imply that it ceases to make automate or informate moves, but instead, that the firm looks to realize a more transformative outcome from its IT moves (see table 1). In this conceptualization, previous successful moves provide both digital options for more advanced moves (Sambamurthy, Bharadwaj, & Grover, 2003), and economies of learning as a firm develops successful IT strategies and experience for its business model. (Schmalensee, 1988)

At any time, a company will have a dominant SIV (Anderson et al., 2000; Chatterjee et al., 2001), but will continue to make automate, informate and transform IT moves to achieve the SIV. We will describe the “distance” to which an industry has progressed toward a Transform SIV as the “Transformative Nature of Strategic IT Vision”. An Automate industry (Anderson et al., 2000) would be characterized as exhibiting a low transformative nature, while a Transform industry (Anderson et al., 2000) would be characterized as exhibiting a high transformative nature.

If different IT visions lead to IT moves, and these moves deliver benefits, opportunities, and options, it would lead to the assumption that, over time, all firms and would continue to move toward the Transform SIV. However, this has been shown not to be the case. Anderson (Anderson et al., 2000) stated that some industries remain in an automate SIV, while Chatterjee (Chatterjee et al., 2001) categorized a number of industries as automate, informate or transform industries. Interestingly, both older established industries, and more recent emergent industries were placed in each one of the categories. This leads to the question: “If firms move through the Strategic IT Vision continuum over time, why do some industries’ firms seem to move together further along the continuum than do the firms in other industries?” The conceptual model is depicted in Figure 2.

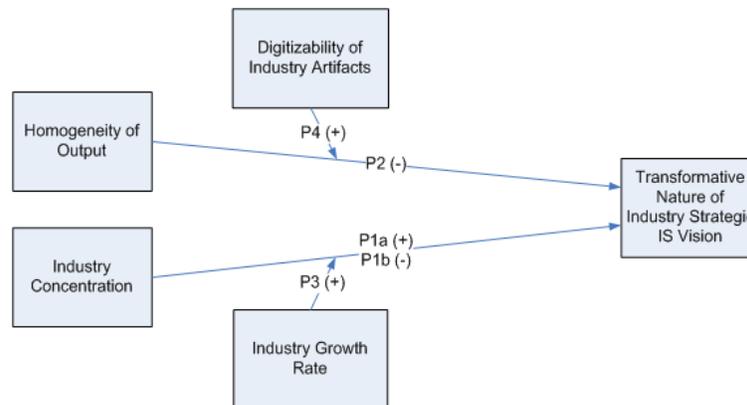


Figure 2: Conceptual Model

As an industry moves toward oligopoly (more than 40% of the market controlled by four firms), a tendency for the development of greater transformational vision is more likely. As firms grow market share, transaction volume grows leading to automation, greater visibility into processes becomes more difficult to achieve without IT systems performing informate tasks. As these companies become dominant players, they will develop either a wider number of partners, or a greater dependency on few partners.

As firms' networks of partnerships become more critical, firms will require informational and transformational IT systems to manage this greater number of relationships, or these more tightly coupled relationships. Although automate and Informate visions may dominate at early stages of development, as firms grow larger within an industry they will develop a history of successful automate and informate moves. These moves provide digital options (Sambamurthy et al., 2003) that the firm may choose to utilize to gain dominance over the other players by shifting the industry in some fashion through a transformation.

P1a: As an industry progresses to oligopoly, the industry will exhibit higher transformative SIV.

If an industry moves beyond oligopoly toward monopoly, incentives for greater transformational IT moves are reduced. In fact, once a monopoly is achieved, incentives for investment in IT moves in general are greatly reduced. (Triole, 1988) Since firms in a monopoly position have little incentive to drive down costs, and little incentive to attempt to draw in customers through differentiated services, IT moves in general will be reduced in monopoly markets. However, the attractiveness of building scale economies should cause a monopolist to direct their IT vision toward the Automate SIV.

P1b: As an industry progresses from oligopoly toward monopoly, the industry will exhibit lower transformative SIV.

Industries pass through four phases of development, emergent, growth, maturity, and decline. One indicator of the current phase of industry development is growth rate. The emergent phase of industry development is indicated by a low growth rate, with few resident firms. These few firms generally do not have high capital for IT investment, and will focus on minimal systems required to run the business. However, as the industry proceeds into the growth phase, the growth rate accelerates. This high growth rate attracts new entrants interested in taking advantage of the investments of the emergent phase of the industry.

At the same time, the going firms in a growth market are likely to attempt to erect barriers to entry. Many non-IT barriers to entry have been observed in the past, such as model year refreshes in automotive and electronics, creation of excess capacity and product differentiation. (Caves & Porter,

1977) An increasing growth rate of an industry can be proposed to move incumbent firms toward a transform SIV, as incumbents seek to erect barriers to entry. Transform SIVs and their accompanying IT moves are generally thought to be more complex and therefore difficult to duplicate, potentially creating barriers to entry.

According to the Theory of Strategic Behavior, continued capital investment is one way to signal *commitment* to new entrants. (Schmalensee, 1988) IT capital investment also signals commitment, and transformative IT capital investment signals more greatly than automate capital investment. The reason for this is that automate signals could be read as being merely a strategy to maximize rents via scale, and not necessarily signal long-term commitment. At the same time, transform signals will tell of a firm's commitment both to the status quo and to competing within the future industry.

Finally, in addition to incumbents' attempts to signal commitment and to erect barriers to entry, newcomers may choose to or be forced to combat the incumbent firms scale advantages and early mover advantages by attempting to fundamentally transform the industry.

When an industry reaches maturity and decline, growth rate slows radically, and then reverses. During these stages of an industry lifecycle, business strategy focus will shift to realizing the greatest rents from previous investments, and to preserve current market share at the lowest possible cost. This would cause a reversal in the positive trend of transformative SIV, due to the importance of Informate for Control and Automate moves for firms in a cost reduction cycle.

P2: Industry growth rate will positively moderate the relationship between Industry Concentration and higher levels of Transformative SIV.

Industries that are characterized by more perfect substitutability of output must seek to derive cost advantages via economies of scale. As scale increases, the firms in an industry have the opportunity to use more efficient techniques and technologies. (Scherer, 1980)

On the other hand, diverse output industries will tend to move toward transformative SIV, due to the competitive dynamics which encourage continued differentiation of products (Caves & Porter, 1977) as well as the enhancement of a firm's customer relationships management & customer experience management.

P3: Industries with higher homogeneity of output will exhibit lower transformative nature of SIV.

Digitizability of artifacts is conceived as the degree to which the products, processes and relationships of an industry can be separated from the limitations of a physical representation. (Dhar & Sundararajan, 2007) Digitizability enables the greater application of IT to a given business situation, because the business artifact can be itself converted to information. As would be expected, in the case of diverse output industries, digitizability strengthens both the opportunity and likelihood of transformative vision noted in Proposition 3. However, an interesting additional effect can be proposed. In a homogenous output industry characterized by a high level of digitizability of artifacts (e.g. – music, software), the digital nature of the industry artifacts will reverse the tendency toward automation SIV. There are several key reasons for this reversal. First, duplication of digital assets reflects a pragmatic zero marginal cost. Digitizability itself produces the superior benefits to those achieved through the automation of physical production processes. Second, digitizability encourages the customization of both delivery vehicles for product, as well as configurability of product (Dhar & Sundararajan, 2007). In general, digitizability significantly decreases the cost of product differentiation efforts, and the delivery of customized products (e.g. – an online download of the customers 10 favorite songs, rather than the requirement to buy 10 complete albums).

As the previous drivers of cost reduction through scale and automation and the barriers of the physical are removed from an industry, a more transformative SIV should be observed.

P4: Digitizability of industry artifacts will positively moderate the relationship between homogeneity of output and level of transformative nature of SIV.

CONCLUSION

While Strategic IT Vision (SIV) is generally considered a firm-level construct, the literature has argued that the industry in which a firm resides seems to affect SIV, as industries tend to exhibit homogeneity around a particular SIV at a given time

Building upon the recognition in the literature of the importance of industry factors in determining IT strategy and IT success (Chiasson & Davidson, 2005; Melville et al., 2004), this paper has built an initial conceptual model through which to view the effects of several industry factors on both the homogeneity and transformative nature of SIV.

We believe that this research question provides an opportunity for additional empirical testing, research and clarification.

REFERENCES

- Anderson, M. C., Banker, R. D., & Ravindran, S. (2000). Value Implications of Relative Investments in Information Technology. *School of Management the University of Texas at Dallas, Nov, 6.*
- Armstrong, C. P., & Sambamurthy, V. (1999). Information Technology Assimilation in Firms: the Influence of Senior Leadership and it Infrastructures. *Information Systems Research, 10(4)*, 304-327.
- Caves, R. E., & Porter, M. E. (1977). From Entry Barriers to Mobility Barriers: Conjectural Decisions and Contrived Deterrence to New Competition*. *The Quarterly Journal of Economics, 91(2)*, 241-262.
- Chatterjee, D., Richardson, V. J., & Zmud, R. W. (2001). Examining the Shareholder Wealth Effects of Announcements of Newly Created CIO Positions. *MIS Quarterly, 25(1)*, 43-70.
- Chiasson, M. W., & Davidson, E. (2005). Taking industry seriously in information systems research. *MIS Quarterly, 29(4)*, 591-605.
- Dehning, B., Richardson, V. J., & Zmud, R. W. (2003). The value relevance of announcements of transformational information technology investments. *MIS Quarterly, 27(4)*, 637-656.
- Dhar, V., & Sundararajan, A. (2007). Issues and Opinions--Information Technologies in Business: A Blueprint for Education and Research. *Information Systems Research, 18(2)*, 125.
- Elliot, S. (2006). Technology-Enabled Innovation, Industry Transformation and the Emergence of Ambient Organizations. *Industry & Innovation, 13(2)*, 209-225.
- Farrell, D. (2003). The Real New Economy. *Harvard Business Review, 81(10)*, 104-112.
- Melville, N., Kraemer, K., & Gurbaxani, V. (2004). Information Technology and Organizational Performance: An Integrative Model of IT Business Value. *MIS Quarterly, 28(2)*, 283-322.
- Sambamurthy, V., Bharadwaj, A., & Grover, V. (2003). Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms. *MIS Quarterly, 27(2)*, 237-263.
- Schein, E. H. (1989). The role of the CEO in the management of change : the case of information technology. *Journal, Working paper (Management in the 1990s (Program)); 89-075.* Retrieved from <http://hdl.handle.net/1721.1/2271>
- Scherer, F. (1980). *Industrial Market Structure and Economic Performance.* Chicago: Rand-McNally.
- Schmalensee, R. (1988). Industrial Economics: An Overview. *The Economic Journal, 98(392)*, 643-681.
- Scott Morton, M. S. (1991). IT-Induced Business Reconfiguration. In M. S. Scott Morton (Ed.), *The Corporation of the 1990s: Information Technology and Organizational Transformation* (pp. 3–23). New York, NY: Oxford University Press.
- Triole, J. (1988). *The Theory of Industrial Organization.*
- Zuboff, S. (1985). Automate/Informate: The Two Faces of Intelligent Technology. *Organizational Dynamics, 14(2)*, 5-18.