

**THE DYNAMICS OF ALIGNMENT:
A PUNCTUATED EQUILIBRIUM MODEL**

Submitted to *Organization Science*¹

By

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The Dynamics of Alignment: A Punctuated Equilibrium Model

Abstract

Several prior articles have emphasized the importance of alignment between business and information system (IS) strategies, and between business and IS structures. Seeking to advance our understanding of alignment, this paper examines the dynamics of how alignment changes through strategy/structure interactions in the business and IS domains. More specifically, the paper addresses the following question: *in what ways does alignment evolve over time?*

Changes in the strategic IS management profile (which includes business strategy, IS strategy, business structure, and IS structure) over time are examined using a punctuated equilibrium model, involving long periods of relative stability, or evolutionary change, interrupted by short periods of quick and extensive, or revolutionary, change. Case studies of changes in business and IS strategies and structure over long time-periods in three organizations suggest that the punctuated equilibrium model provides a valuable perspective for viewing these dynamics.

A model of the dynamics of alignment emerged from rigorous analysis of the case transcripts. The cases suggest that a pattern of alignment may continue over a long period of time, because either the level of alignment is high or managers do not recognize the low alignment as a problem. Revolutions, involving changes in most or all dimensions of the strategic IS management profile, interrupt the evolutionary changes. However, organizations hesitate to make such revolutionary changes in strategic IS management profiles. Complete revolutions apparently require a combination of strong triggers. Finally, post-revolution adjustments to one dimension of the strategic IS management profile seem to follow revolutionary changes.

(Alignment; Strategic IS Management; Organizational Evolution; Punctuated Equilibrium)

Introduction

Evolutionary Period 1: Until 1993, ENERGY had been operating in a stable fashion, with little change in strategic orientation, organization structure, or corporate philosophy. It was historically very successful. It had been following a **Defender** strategy, maintaining its territory through low costs but not seeking opportunities for growth. However, the energy industry was becoming increasingly competitive, partly due to protracted low price of crude oil and natural gas in the late 1980's and early 1990's. Projected future prices also showed no significant increase.

Concentrating on keeping costs down, ENERGY had a **mechanistic and centralized** structure based on a "command and control" model. As with other Defenders (Delery and Doty 1996), there was an unwritten contract with the employees. They were expected to be loyal and work hard, while ENERGY promised a good salary, excellent benefits, and lifetime employment. However, the employees were constrained, or as one interviewee put it, "mushroom capped" - that is, ENERGY exerted a paternalistic control over the employees, managing the employees' careers for them in terms of job assignments, training, and advancement.

During this period, IS management was highly **centralized**, with a central IS group serving the various business areas. The IS group played a **non-strategic** role, supporting the business areas but doing so from a technological focus rather than a business-oriented one. They were perceived as telling business people how to do things rather than listening to their needs.

Revolutionary Period: The primary risk with a Defender business strategy is the inability "to respond to major shift in the market environment" (Miles et al. 1978). ENERGY also suffered from this problem. Not only did it have a tendency to reinvent the wheel (for example, instead of using existing external knowledge bases and vendors, oil rigs and drilling platforms were designed and built in-house, from scratch), but it also failed to respond to increasing competition. Continued success had apparently produced a complacent, inward-looking, and inflexible corporate culture. It was therefore no surprise that ENERGY's financial performance in early 1990's was disappointing relative to other energy firms.

A Customer Support Manager: "While everybody else was scrambling we had managed to stay the course. Unfortunately for us, we were staying a course that wasn't fit for the world in which we were heading, and when we got there in 1988-89-90, we found that we were ill

prepared for that world. We had a tremendous problem with our cost structure, our prices collapsed in the exploration and production world, margins collapsed in the refining world, chemical margins were in the bottom of their ten-year cycle.”

A new President and Chief Executive Officer, Paul Hill, was hired in April 1993. Hill discarded traditional solutions to ENERGY’s problems, instead insisting on a complete corporate transformation. He commissioned a thorough evaluation of the company’s mission, structure, and direction. The company’s business strategy shifted toward **Analyzer** with greater attention to the market conditions and efforts to identify growth opportunities. The company hired an external consultant to examine the company and the industry environment. The external consultant, along with some internal participants, recommended an improved command and control structure. This was summarily rejected by Hill. In February 1994, the CEO and four executive vice presidents mandated a major shift in corporate philosophy from centralized "command and control" structure, which was considered unsuitable for rapid market changes, to what they called “federal governance” (A Customer Support Manager)¹³. Shifting the business structure toward a **semi-structured and hybrid** form, decision-making authority was moved to the lowest organizational level possessing the information needed to make the decision.

The company departed from a *de facto* policy of life-long employment toward more transient employment. It now placed greater emphasis on employee development, not only to improve organizational performance but also to help the employees become more marketable. Moreover, there was a shift toward greater acknowledgment of uncertainty and risk: "urgency combined with 80 percent success replaced the prior focus on 100 percent success without urgency" (An IT Manager).

With the corporate transformation on January 1, 1995, each subsidiary became an independent entity with individual profit and loss responsibility. As expected in a hybrid business structure, top management of ENERGY was performed by a leadership council, and a larger leadership group, which included senior executives from the various subsidiaries. Similarly, each subsidiary’s leadership group and council included one or more representatives from ENERGY.

One of the subsidiaries, SUBSID, employs about 1800 people, including approximately 800 in the IS group¹⁴. SUBSID’s mission was to provide a variety of corporate services, including IS, not only to ENERGY subsidiaries, but also on the open market to other organizations not related to ENERGY

(including other firms in the energy industry). SUBSID had an existing revenue base in excess of \$300 million, mainly from other ENERGY subsidiaries. SUBSID's board included the CEO and three other senior executives from ENERGY, but not the heads of the other business units (to avoid conflict of interest). Moreover, SUBSID's CEO was one of the 14 members of ENERGY's leadership council.

SUBSID's corporate siblings were free to look outside for IS services. A CIO was appointed for each business unit, and IS accountability and decision making was pushed into the business units. The IS management structure for ENERGY was thus **decentralized**. The shift in IS structure was accompanied by increased recognition of the importance of IS, and a shift toward a combination of **low cost and growth** IS strategy. ENERGY was seeking to reduce business and IS costs through efficiencies expected from market competition. While lower costs was the main goal, there was also the expectation of increased revenues from SUBSID as it was free to provide IS services to other companies. SUBSID's corporate siblings continued to have some influence on it as its valued customers, as well as through ENERGY's top executives who were members of SUBSID's board.

Evolutionary Period 2: Following the major upheaval, the subsidiaries settled down to fine-tune internal structures and strategies. SUBSID had always been a cost center, and its senior executives lacked experience of managing a for-profit enterprise. They spent nine months assessing strengths, weaknesses, market, and competition, completing the strategic plan in September 1995.

SUBSID initially started with a **Prospector** business strategy, seeking to get external business in a creative fashion. It sought business not only from systems development but also from selling surplus IS capacity and IS-related infrastructure. Its internal information systems, and superior IS skills, including advantages in subsurface information technology and infrastructure processing (such as massive parallel processing for seismic data), were seen as potentially key in **differentiating** SUBSID from its competitors and enabling **growth** of its business.

The September 1995 strategic plan led to a change in SUBSID's structure, from centralized cost-centers to a matrix structure including 21 lines of businesses with profit and loss responsibilities. The **semi-structured/hybrid** business structure was aligned with SUBSID's new **Prospector** business strategy, emphasizing on revenue growth and customer satisfaction. SUBSID created the position of

Manager (Business Development) to pursue external contracts, made a Customer Support Manager responsible for each of the ENERGY customers, and appointed a CIO for its internal systems. IS management internally within SUBSID was done in a **centralized** fashion by the CIO. The CIO was responsible for deciding about the systems to be used internally by SUBSID's lines of businesses. The internal systems were also generally centralized.

SUBSID's other strengths included industry knowledge and the ability to do oil and gas accounting at about half the industry cost. However, several factors offset these strengths. SUBSID was now competing for both existing and new business with large competitors eager to get a foothold in the energy industry. Their strengths were in areas where SUBSID was weak, including deal-making and relationship-building skills. To overcome these capability gaps, SUBSID started hiring commissioned salespersons for the first time in company history. Moreover, the established attitudes within the organization inhibited dealing with the new emphasis on revenue enhancement. SUBSID personnel had to make a transition from treating their ENERGY customers as a captive audience to treating them as free-market customers. As an IT manager put it, there was a shift from telling users "the one, best way" to "advise and counsel, but let the customer decide." Finally, SUBSID had no track record in the external market, and no list of references. The interviewees also felt that other major energy companies would hesitate doing business with SUBSID due to the fear that this may help a competitor (i.e., ENERGY) through additional revenues and potential access to sensitive data.

Free to go elsewhere for IS services, ENERGY's other business units started investigating such possibilities. Due to the confidence that it could be very competitive with other service providers, at least in the energy industry, SUBSID viewed this as both an obstacle and an opportunity. The search for an external vendor led to a better appreciation of the value of SUBSID, and also enhanced SUBSID's credibility with other subsidiaries of ENERGY. Their assessments of SUBSID's performance improved as well, going up by five percentage points in 1997 in terms of overall satisfaction level.

The obstacles encountered in seeking external contracts, along with the difficulties other subsidiaries of ENERGY faced when they sought external vendors, led to a shift in SUBSID's strategy toward **Analyzer**. Instead of pursuing a Prospector strategy through increased external business,

SUBSID now focused mainly on internal (within ENERGY or within its global parent company) customers. To pursue external opportunities, it decided to look for a strategic alliance with an IS vendor. Moreover, rather than trying to provide all kinds of IS-related solutions, SUBSID focused on systems development and delivery. In May 1997, SUBSID obtained a \$100 million project from another ENERGY subsidiary. SUBSID was conducting this project along with an external vendor. In addition to the business from the ENERGY companies, SUBSID obtained several external projects, ranging from \$100,000 to over \$5 million. Its revenues for 1996 were about \$350 million and \$430 million in 1997.

When we last visited SUBSID in April 1998, it had continued its post-revolutionary changes along three basic lines. The biggest change had been the merger of SUBSID, a United States based entity, with other similar subsidiaries of ENERGY's global parent to form a single IS and business services subsidiary supporting all the business units of the global company on a worldwide basis¹⁵. SUBSID was still pursuing an Analyzer business strategy, although its market focus had continued to shift somewhat from providing services to the general energy industry towards gaining a larger share of ENERGY's parent company's business. The new organization's share varied widely between business units, but overall it had captured only 20 percent of the global parent's available business in the areas where it provided service (i.e., IS, supply chain management, transaction processing, and consulting). While SUBSID would continue to seek new opportunities outside the global parent company, it planned to be not as aggressive until it had explored all the internal opportunities for new business.

The second post-revolutionary change involved further consolidation of SUBSID's lines of business, first from 21 to 13 and then to four¹⁶. The organizational structure continued to be semi-structured/hybrid but had evolved into a three dimensional matrix based on SUBSID lines of business, geographical regions, and the business units of ENERGY's global parent.

The third significant post-revolutionary initiative was a continuation of the search for acquiring new business skills related to marketing and relationship management, but with a slight twist. Although SUBSID was still hiring individuals with specific expertise in these areas, it was also exploring the possibility of various strategic partnerships to enhance its competencies and market attractiveness. For example, it had entered negotiations with an enterprise resource planning system vendor to become a

certified provider. It was also having with one of the business units of ENERGY's global parent regarding the creation of an arrangement wherein SUBSID would track and manage inventory and sales for that customer. Other ongoing discussions concerned a possible joint venture or partnership with a consulting firm for a wide range of services to the energy industry and a potential partnership with a firm in the facilities and document management arena. Finally, SUBSID had a continuing relationship with another consulting firm for building a knowledge base designed to capture the skills and competencies related to marketing its services to external customers. To oversee these partnerships, SUBSID had created a new executive position responsible for "Strategic Relation Planning" on the same level as the CFO and CIO, reporting directly to the CEO.

Despite these changes, the underlying principle remained the same: anything SUBSID did would be under the free market umbrella. If it could not compete with the other service providers on a level playing field, or better opportunities surfaced elsewhere, the deal would not be completed.

----- Insert Table 5 about here -----

Conclusions: Table 5 summarizes the changes that occurred at ENERGY. The strategic IS management profile during the initial evolutionary period had a high level of overall alignment although IS was considered non-strategic. While ENERGY enjoyed good short term IS performance, its business performance was deteriorating, apparently due to ENERGY's failure to react to changing environment (reduced prices, increased competition).

A new CEO and a consultant's report provided further impetus for the revolution in which all four dimensions were changed, but alignment was maintained at a high level. At this time, a subsidiary focusing primarily on IS, SUBSID, was created. The initial strategic IS management profile of SUBSID had medium overall alignment. SUBSID's Prospector business strategy was not well aligned with the other dimensions, and it therefore no surprise that over the next several months, SUSPID encountered problems in pursuing this strategy. Recognizing its limitations in seeking external growth, SUBSID underwent post-revolutionary changes. Its business strategy changed to Analyzer, which was better suited to the other three dimensions. Consequently, the overall alignment became high. Short-term business performance seemed to have improved as a result of this revolution by redesign.

DISCUSSION

This paper has used a punctuated equilibrium model to examine the dynamics of alignment. Three case studies were used to better understand the way in which alignment evolves through modifications to an existing alignment pattern, punctuated by periodic transitions to an altogether different pattern of alignment. As discussed below, our results integrate prior literature and provide some new insights, for organization science in general and for strategic IS management in particular.

Evolutionary periods and resolution without redesign: Each case had long periods of no change in the strategic IS management profile. Prior literature (e.g., Miles and Snow, 1996) suggests that these evolutionary periods are characterized by a high level of alignment. We did find a high level of alignment during the evolution in ENERGY. At DIVFIN, the overall alignment was medium, although all misalignments concerned IS strategy. The evolutionary period at LEASE had low overall alignment, as business and IS alignments were high, but all four cross-dimensional alignments were low.

Thus, the paper conforms to the punctuated equilibrium model, but differs from the prior literature in suggesting that the long evolutionary periods may sometimes be characterized by a *low* level of alignment. The evolutionary periods at both DIVFIN and LEASE had misalignments, which were apparently resolved without redesign, as both companies' top executives believed that IS was not strategic and so it did not need to be aligned with business.

Incomplete revolutions and reluctance toward resolution by redesign: Our cases suggest that organizations hesitate to make revolutionary changes in which all or most of the dimensions of the strategic IS management profile are modified. At ENERGY, the managers initially commissioned to suggest strategic changes proposed a structure that was simply an improved version of the previous structure. Following this tentative change, ENERGY did eventually undergo a complete revolutionary change, but only due to the strong stance taken by the new CEO. Similarly, at LEASE, the pressure from the lender banks eventually caused a revolutionary change. However, this first revolutionary change followed some initial hiccups, and a change in the CEO, as the first CEO (Rick Moon) made minor changes, focusing primarily on cutting costs through elimination of jobs. The second revolution at LEASE encountered less hesitation than the first, but it was essentially a step back toward the strategic

IS management profile that existed prior to the first revolution. The reluctance to make revolutionary changes was also evident at DIVFIN. A consulting firm's report initiated thinking about alternative ways of improving organizational performance, but the company took time to identify specific ways of doing so. Moreover, DIVFIN looked for an IS partner that was similar to itself, and quite reluctantly entered into a partnership with a culturally different vendor.

Thus, the paper suggests that although occasional revolutionary changes in the deep structure (the strategic IS management profile in this context) may significantly help the organization in the long run, such revolutions too may be inhibited by cultural or structural inertia (Tushman and O'Reilly 1996). Consequently, organizations sometimes change some dimensions of the deep structure, but do not change the remaining dimensions.

Revolutionary changes and resolution by redesign: All three cases suggest that the periods of evolution are punctuated by revolutionary changes in the strategic IS management profile. Each company made revolutionary changes to transform the alignment pattern that had continued for a long period. ENERGY and LEASE underwent complete revolutions, wherein all four dimensions of the strategic IS management profile were changed, whereas DIVFIN underwent an incomplete revolution as three of the four dimensions were changed during the revolution. This finding is consistent with the basic punctuated equilibrium model, discussed earlier. Through evolutionary changes, managers incrementally alter strategies and structures to keep the lack of alignment within tolerable limits. However, "sooner or later, discontinuities upset the congruence that has been a part of the organization's success" (Tushman and O'Reilly 1996; p. 12).

Consistent with the reluctance to make revolutionary changes, we found all the revolutions to require some combination of five **strong triggers** -- environmental shifts, sustained low performance, influential outsiders, new leadership, and perception transformation. At ENERGY, the strategic IS management profile during the initial evolutionary period had a high level of alignment. This profile had served ENERGY well for some time, but a new profile became essential when competition increased and prices declined. At LEASE, the initial strategic IS management profile was continued despite the low alignment, based on the belief that IS was not important. However, when the environment changed

with the new tax laws and changing economics of the IS industry, LEASE had to change its strategic IS profile. All three cases indicated that alignment profiles may also be radically altered when the business or functional (IS in this case) performance deteriorates. For example, when faced with bankruptcy and the stringent controls enforced by the banks, LEASE quickly made large-scale changes in revolution 1. The presence of influential outsiders also seemed to motivate revolutions. In all three cases, the revolutions were triggered by actions by external agencies – the establishment and use of direct controls by the lending banks at LEASE, the consulting firm’s report and the entry of international firms into the Australian market at DIVFIN, and the consulting firm’s report at ENERGY. Moreover, the potency of these influential outsiders is amplified by major changes in leadership (including a new CEO), which played a critical role in the revolutions at LEASE and ENERGY.

Each of the above four factors -- environmental shifts, sustained low performance, influential outsiders, and new leadership – has been discussed as possible triggers of revolutions in the prior literature (Haveman 1992; Lant and Mezias 1992). However, we found another trigger, perceptual transformation, which does not seem to have been discussed earlier. We found revolutions to be triggered by significant changes in the perceptions concerning IS (at LEASE in both revolutions as well as at DIVFIN) or the organization’s skills in a certain area (e.g., the lack of deal-making skills at SUBSID). It is possible that we discovered this trigger since we examined alignment across an overall business domain and a specific area (i.e., IS).

Possible ineffectiveness of resolution by redesign: It may be argued that if a low level of alignment, or conflict in the alignment profile, is responsible for the poor performance, organizations would seek to resolve this conflict by redesign (Brown and Magill 1998; Gresov 1986). As discussed above, we also found that such resolution by redesign to be used in an attempt to resolve the conflict. However, we found that the resolution by redesign may or may not be effective. At DIVFIN, the revolution did not increase overall alignment; it increased some of the types of alignment but reduced some others. At ENERGY, the alignment within the strategic IS management profile was high both before and after the revolution, although the revolution did change all four dimensions of the profile. Finally, the first revolution at LEASE increased alignment considerably, but the second revolution undid

the changes and led to a low level of alignment. Thus, the resolution by redesign seen in revolutionary changes may not lead to an increase in overall alignment, and may sometimes even reduce it.

Post-revolutionary changes: Since revolutions may sometimes reduce alignment, they may lead to adjustment in alignment patterns. At DIVFIN, structural alignment decreased after the revolution, as the business structure had remained decentralized but the IS management had been centralized. This caused problems in implementing the outsourcing relationship. Consequently, the management of the relationship was re-decentralized (this increased structural alignment). At SUBSID also, the alignment represented by the post-revolution strategic IS management profile faced problems due to the company's lack of competence in generating external IS revenues. This was addressed by shifting business strategy to Analyzer and focusing on corporate siblings while also seeking external revenues.

No change to the strategic IS management profile was made at LEASE during the evolutionary period following the first revolution. Its employees worked hard to improve its performance, but their activities followed the prior strategy and structure. However, shortly after the first revolution had produced the desired improvements, the second revolution caused the strategic IS profile to revert almost entirely (all three aspects except IS structure), to the profile before first revolution.

Thus, the paper suggests that revolutions may be followed by post-revolution adjustments to the strategic IS management profiles, either to reinforce them or to take a step back toward the pre-revolution situation. A revolution may take the organization too far in another direction, and the new alignment pattern may be inappropriate for the organization's competencies. The organization may subsequently seek new competencies and further modify the alignment pattern. In some other cases, the revolution may not go far enough, and the changed strategic IS management profile may consequently be low in one or more kind of alignment. This may cause the organization to further fine-tune the alignment pattern, possibly by shifting back somewhat toward the pre-revolution situation. Such. post-revolution adjustments are consistent with Priogine and Stengers' (1984, p. 187) argument that no single change can transform an entire system instantaneously. Sastry (1997) also suggests that trial periods, similar to our post-revolution adjustments, follow revolutionary changes. Moreover, the organization may go through several such iterations (of revolution and post-revolution adjustments) in

trying to establish alignment (Hambrick and D'Aveni 1988). The following comment seems to reflect the situation at LEASE where the second revolution offset most of the changes made in the first revolution:

“Deepening declines may also result in vacillation among alternatives, so swiftly begun and shifted that no clear course is charted” (Miles and Snow 1996; p. 80).

The preceding observations should be considered in the light of several **limitations** of this study, which restrict its generalizability. First, the paper is limited due to the use of a very small number of cases. The findings are based on only three organizations, although they are of different sizes and from different industries. Second, the cases were studied using retrospective interviews. The interviews were conducted during one to three visits at fairly close points in time, whereas our focus was on changes that occurred over long time periods. Third, although we collected the data using key informants at each organization, a wider set of informants may have provided additional insights. For example, only one non-IS executive was interviewed at DIVFIN. Moreover, we could not interview some executives who had played important roles but were no longer at these companies. Finally, we collected and used an extensive amount of qualitative data, but did not use any quantitative measures of alignment or performance. Although our conclusions regarding alignment and changes in them are rooted in rigorous analysis of considerable qualitative evidence, they have not been tested through quantitative measures of alignment or its determinants.

The paper has several **implications for future research** in the broad area of organization science. First, the approach of viewing alignment in conjunction with punctuated equilibrium models should be valuable in research on other areas. Research on dynamics of alignment in other areas may similarly consider an alignment profile (involving strategy and structure of the overall business and a functional area) as deep structure that undergoes evolutionary and revolutionary changes (Gersick 1991). Moreover, since combining alignment with the punctuated equilibrium model provides a way of explicitly considering events and organizational choices over time, it may be useful for studying the co-evolution of organizations and their environments (Jones et al., 1998; Koza and Lewin 1998).

Second, our use of Gresov's (1986) work on conflict among multiple contingencies should also be of interest to researchers in other aspects of organizations. This paper has shown the value of

Gresov's resolution by redesign and resolution without redesign approaches for viewing alignment in the long run (Brown and Magill 1998). These approaches may also explain two deviations we found from what has been implied in prior research (e.g., Miles and Snow 1996); unlike prior research we found that: (i) the evolutionary period may or may not be characterized by a high level of alignment; and (ii) the revolutionary change need not necessarily increase alignment. The use of resolution without redesign during evolutions could explain why some organizations continue for a long time with what appears, at least to outsiders, as a low level of alignment. The use of resolution by redesign to understand revolutionary changes might explain why they do not increase alignment; the resolution by redesign may reduce alignment among some dimensions and thereby offset increase in alignment among other dimensions. Further research on punctuated equilibrium models in other areas is needed to examine how resolution without redesign can help sustain low level of alignment in the absence of substantial performance degradation. Further research is also needed to examine the conditions that influence whether alignment will increase or decrease as a result of revolutionary changes.

Third, we found strategic and structural changes during the revolution to be reinforced or offset by post-revolutionary changes. Such post-revolutionary changes are consistent with Sastry's (1997) study based on simulations, but have not been examined in prior field research. Further research is needed to validate or refine our classification of periods of changes in alignment profiles into four types (evolutions, incomplete revolutions, complete revolutions, and post-revolutionary changes). Additional case studies examining changes in alignment profiles should help in doing so.

Finally, we found that revolutions may be triggered by a number of factors, one of which – perception transformation – has received little attention earlier. Studies of punctuated equilibrium models in other areas (e.g., research and development) may examine if substantial changes in perceptions about the importance of that area may similarly trigger revolutionary changes. Additional cases should also examine other causes that trigger revolutionary changes and develop greater insights into the factors that determine whether the revolution would be incomplete or complete.

The paper also makes some potentially important contributions to the literature on strategic IS management. We believe that it improves upon prior literature on strategic IS alignment because it takes a dynamic, holistic, and theory-based view of alignment.

Our examination of the changes that occurred over time in three cases is an initial step in making the transition from the earlier static view of alignment toward understanding the dynamics of alignment. By examining the cases, individually and in comparison to each other, in the light of a punctuated equilibrium model, the paper provides insights into the ways in which alignment may possibly increase or decrease over time. Future research in this area should empirically test these findings, using additional cases as well as multi-stage questionnaire surveys.

This paper also contributes to the strategic IS management literature by providing a more holistic view of strategic IS management. The strategic IS management profile included business and IS strategy and structure, unlike prior studies which have focused on only two of the four dimensions, such as business and IS strategy (Broadbent and Weill 1990; Chan et al. 1997; Lederer and Mendelow 1989) or business and IS structure (Ein-Dor and Segev 1982; Fiedler et al. 1986).

This study also differs from prior work on IS alignment in its use of a deductive, theory-based view of alignment. Future studies of alignment in strategic IS management and other areas may benefit from a similar use of prior theory to identify the ideal alignment patterns. This approach, which has rarely been used in IS research (Jarvenpaa and Ives 1993; Brown and Magill 1998), is an attractive alternative to the more popular approach of empirically generating the ideal alignment patterns (e.g., Sabherwal and Kirs 1994; Venkatraman and Prescott 1990) because it allows replication and fosters cumulative research.

In conclusion, the paper has attempted to advance our understanding of the dynamics of alignment. The paper suggests that claims about performance effects of alignment should be couched in explicitly longitudinal terms since the same alignment pattern may not be effective over extended periods. Based on the application of the punctuated equilibrium model to the three cases, the paper suggests that the changes in alignment are, for the most part, small and evolutionary. These changes may prevent catastrophes by controlling misalignments, but they inhibit moving to an altogether

different pattern of alignment. Therefore, managers should periodically scrutinize their organizations' IS alignment patterns, lest these patterns mask symptoms of future failure. Revolutionary changes in the strategic IS management profiles may be necessary to move the organization to a path that offers a greater performance potential, rather than continuing on the previous path by simply fine-tuning strategies and structures. Moreover, managers making revolutionary changes in their "deep structures" should be prepared to fine-tune them even after (and especially, soon after) the revolution.

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