ALIGNMENT AND MISALIGNMENT IN KNOWLEDGE-BASED ENTERPRISES

Strategic alignment is hypothesized to lead to higher performance, but research has found mixed results. Eight case studies are examined to develop four possible explanations as to why the relationship may not always hold. Knowledge strategy is introduced as a key element of a firm’s strategic alignment portfolio.

Introduction

Strategic alignment has endured as a significant management concern for over two decades because it remains a tantalizing goal (Luftman, Kempaiah & Nash, 2006). The alignment hypothesis would suggest that higher strategic alignment between business and IS strategy should lead to superior performance compared with lower levels of strategic alignment. This has been supported in several studies (Cragg, King & Hussin, 2002; Oh & Pinsonneault, 2007). Additionally, alignment has been found to be a better predictor of perceived performance than realized business strategy itself (Chan, Huff, Barclay & Copeland, 1997). Not all studies have found uniformly consistent results, however, and the intent of this paper is to investigate and suggest possible explanations for why findings may not always support the alignment hypothesis, as represented by Figure 1.

Figure 1

Theorized and Unexpected Results from the Alignment Hypothesis

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1 The authors wish to acknowledge the financial support received from the Social Sciences and Humanities Research Council of Canada, without which this research could not have been completed.
The Strategic Alignment Hypothesis

Strategic Alignment has been defined as “the alignment between business unit strategic orientation and IS strategic orientation” (Chan et al., 1997, p. 132). To examine the strategic alignment hypothesis requires integration of three key theory elements. The first is the concept of strategy and the selection of component (i.e. business, IS and knowledge) strategies. The second is a conceptualization of how the component strategies fit together. The third is a perspective on performance.

Strategy

Strategies can be intended or realized (Mintzberg, 1978). Intended strategies are those that are official and may be written down, whereas realized strategies are those reflected in decision making, resource allocation, and activities conducted by the organization (Chan, Huff & Copeland, 1998). In this light, strategy can be defined as “a pattern in a stream of decisions” (Mintzberg, 1978, p. 934) and it has been noted that “strategy exists in the cognition of managers but is also reified in what companies do” (Gavetti & Rivkin, 2007, p. 435). This focuses attention to conceptualizations of strategy less about plans and planning and more about impacts and acknowledges that strategy is required to deal externally with acquiring resources and meeting market demands and internally with coordinating various organizational elements and resources. Strategies are defined in this paper in terms of coherent profiles or types that capture a range of strategic behaviours.

Business strategy. Miles and Snow (1978) developed four business strategy profiles: defenders, prospectors, analyzers, and reactors. Miles and Snow’s (1978) typology has been widely used as its validity and applicability has been generally supported (Shortell & Zajac, 1990). Additionally, it is an appropriate choice for studies that link strategy selection with organizational outcomes as adherence to one of the prospector, analyzer or defender profiles has been shown significantly linked to higher performance (Doty, Glick & Huber, 1993). Defenders are stable organizations with predictable and narrow product domains, often competing on low prices and cultivating a strong client base. They devote attention to improving efficiency in their current operations as opposed to seeking out new ventures. Prospectors continually seek out new market opportunities and create change and uncertainty in their industries, but at the cost of low operational efficiency. Analyzers operate in a stable domain, where firm operations are run efficiently and current clients supported, and an opportunistic domain, where the firm seeks out market opportunities and develops new business lines. Reactors are unable to respond to change effectively or to induce change in the industry, making strategic adjustments only when they are forced to do so. All but the reactor is seen as a consistent and viable strategy (Sabherwal & Chan, 2001).

Information systems strategy. IS strategy is long-term guidance concerned with “aligning IS development with business needs and with seeking strategic advantage from IT” (Earl, 1989, p. 63). This is differentiated from IM strategy, which deals with effectively managing IS resources, and IT strategy, which deals with developing technical policies and architectures (Earl, 1993). The difference has also been described in terms of supply and demand, where IS strategy is focused on what the business demands of IS, while IT strategy is focused on supplying particular technologies to support the firm (Hackney, Burn & Dhillon, 2000). IS strategy is a multidimensional construct and can be interpreted or defined in many ways (Hirschheim & Sabherwal, 2001). Hirschheim and Sabherwal (2001) and Sabherwal and Chan (2001) defined similar typologies of IS roles in efficiency, flexibility or opportunism, and comprehensiveness. The IS for efficiency strategy focuses on internal and inter-organizational efficiency and long-term decisions; the IS for flexibility strategy focuses on market flexibility and quick decisions; and the IS for comprehensiveness strategy balances the two, enabling comprehensive decisions and responsiveness. A non-strategic IS strategy is administrative in nature, does not look for information external to the firm, and does not invest in operational or inter-organizational information systems (Denford & Chan, 2007).
**Knowledge strategy.** A knowledge strategy can be viewed as “the overall approach an organization intends to take to align its knowledge resources and capabilities to the intellectual requirements of its strategy” (Zack, 1999, p. 135) and “a number of key decisions related to knowledge that provide a context or strategic intent for the firm” (Casselman & Samson, 2007, p. 70). Bierly and Chakrabarti (1996) used cluster analysis to define four distinct generic knowledge strategies within the pharmaceutical industry: loners, explorers, exploiters, and innovators. Loners were ineffective learners, with higher R&D expenditure ratios, slow technology cycles and low knowledge dispersion (Bierly & Chakrabarti, 1996). Explorers were creators or acquirers of new knowledge required to be competitive in a chosen strategic position (Zack, 1999). Explorers were found to have high levels of radicalness but were similar to other groups in other areas (Bierly & Chakrabarti, 1996). Exploiters had capabilities that exceeded the requirements of their competitive positions, allowing them to use their existing knowledge to deepen or broaden its position (Zack, 1999). Exploiters were seen to have low R&D expenditures and broad but shallow knowledge bases (Bierly & Chakrabarti, 1996). Members of the innovator profile closely integrated the best characteristics of explorers and exploiters in a balanced approach (Zack, 1999). Innovators were the most aggressive and fastest learners, combining internal, external, radical and incremental learning (Bierly & Chakrabarti, 1996). Innovators and explorers were generally more aggressive in their approach to knowledge (Bierly & Chakrabarti, 1996; Zack, 1999).

**Strategic Alignment**

Strategic alignment research is heavily influenced by contingency theory, which holds that the structural design of an organization must fit with the environment to be effective (Thompson, 1967). Information systems (IS) strategic alignment comes from the belief that there is a need to align business strategy and technology policy as a precondition for superior firm performance (Zahra & Covin, 1993). Similarly, a relatively new view of strategic alignment focuses on the importance of aligning business and knowledge strategies, reflecting the importance of knowledge as a critical organizational resource (Snyman & Kruger, 2004). Filling out the circle of strategy types, Chan, Denford and Jin (2008) conducted a study of knowledge and information systems strategy alignment, finding significant relationships between strategy alignment and performance. Both the recognition of aligned portfolios and the conceptualization of fit that allows their operationalization are important to this study.

**Aligned portfolios.** Alignment-based studies are often expressed in terms of typologies, particularly that of Miles and Snow (1978). IS typologies that are linked to Miles and Snow’s (1978) business typology generally show convergence towards a set of IS strategy types (Hirschheim & Sabherwal, 2001; Sabherwal & Chan, 2001). Prospectors have been found to be aggressive in their pursuit of technology as a group, narrowing the differences between individual firms and making technology more of a cost for this group than a contributor to success; defenders are generally more conservative in their investments in technology, focusing on those areas directly related to their core business, and thus contributing to their competitive advantage (Dvir, Segev & Shenar, 1993). The reactor type is seen as having a delayed (Earl, 1989) or non-strategic use of IS (Sabherwal et al., 2001), and is considered a non-viable strategy, so even when aligned is not expected to have a positive influence on performance (Sabherwal & Chan, 2001). Extending the existing research to include knowledge strategies, exploiters have broad but shallow knowledge bases and focus on using existing knowledge (Bierly & Chakrabarti, 1996) giving them a defensive orientation. Explorers focus on increasing competitiveness through the creation or acquisition of new and radical knowledge (Zack, 1999), matching the prospector strategy of continually expanding product lines or developing new markets. Members of the innovator profile closely integrate the best characteristics of explorers and exploiters (Zack, 1999) making their knowledge strategy a close parallel to the analyzer business profile. The ineffective loner knowledge strategy, with its high expenditures but slow technology cycle time (Bierly & Chakrabarti, 1996) is seen to mirror the unfocused reactor business profile. These linkages can be used to establish relationships between each of these strategy types, resulting in the coherent strategic profiles defined in Table 1.
Table 1

Cohesive Strategic Portfolios

<table>
<thead>
<tr>
<th>Strategy Type</th>
<th>Portfolio</th>
<th>Conservative</th>
<th>Proactive</th>
<th>Balanced</th>
<th>Non-Viable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business</td>
<td>Defender</td>
<td>Prospector</td>
<td>Analyzer</td>
<td>Reactor</td>
<td></td>
</tr>
<tr>
<td>Information Systems</td>
<td>Efficiency</td>
<td>Flexibility</td>
<td>Comprehensiveness</td>
<td>Non-Strategic</td>
<td></td>
</tr>
<tr>
<td>Knowledge</td>
<td>Exploiter</td>
<td>Explorer</td>
<td>Innovator</td>
<td>Loner</td>
<td></td>
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</tbody>
</table>

Concepts of fit. Accurate conceptualization of fit is important, as “the key concept in a contingent proposition is fit, and the definition of fit that is adopted is central to the development of the theory” (Drazin & Van de Ven, 1985, p. 515). Bergeron, Raymond and Rivard (2001) demonstrated how each of Venkatraman’s (1989) categories of fit when applied to a common set of data can yield different results. This implies that “each approach to fit is theoretically and empirically different, thus the need for a clear theoretical justification of the specific approach adopted by the researcher” (Bergeron et al., 2001, p. 138). One form of fit is as matching, where the “fit is specified without reference to a criterion variable, although, subsequently, its effect on a set of criterion variables could be examined” (Venkatraman, 1989, p. 430). Fit is conceptualized as a theoretically defined match between two or more variables. For this study, a match between the three composing strategies of a strategy portfolio is hypothesized to lead to high performance, as illustrated by the solid cubes in Figure 2, whereas the lack of a match is hypothesized to lead to low performance.

Figure 2

Fit as Matching Strategic Portfolios

Performance

Ultimate questions regarding alignment are whether and how it contributes to firm performance. The model of performance used in this study pays particular attention to non-balance sheet forms of capital and takes the form of a composite index that is comprised of physical, financial, human, structural, relational and innovation capital (Chan et al., 2008). The first two of these are traditional and appear on
the balance sheet of an organization, where physical capital refers to plant and major equipment and financial capital refers to financial assets. Human capital can be defined as the individual capabilities, knowledge, skills, experience, and problem-solving abilities that reside in people in an organization (Allee, 2000; Piazza-Georgi, 2002). Structural capital is composed of systems and work processes including communications and information systems technologies; conceptual models of how the business operates; and other “codified” knowledge including documents, patents and copyrights (Allee 2000). Relational capital encompasses the value embedded in external alliances and relationships with customers, strategic partners, investors, and the community (Allee 2000). Innovation capital can be described as a firm’s collective ability to innovate, learn, and adapt to its competitive environment (McElroy, 2002). It should be noted that the measures are perceptual; however they should be an accurate representation of firm performance, as managerial assessment and objective performance indicators are highly correlated (Venkatraman & Ramanujam, 1986).

In summary, this paper hypothesizes the existence of three realized strategy typologies that are aligned through the matching of coherent types into a strategy portfolio in order to lead to higher performance. The next section will detail the methods used to test the hypothesis.

**Research Methodology**

The case study has been suggested as being appropriate for answering research questions relating to the ‘how’ and the ‘why’ of a phenomenon (Yin, 1994). This research is a multiple case study, following guidelines and standards established for case study research in IS (Benbasat, Goldstein & Mead, 1987; Lee, 1989; Yin, 1994).

**Data Collection**

The unit of analysis is the firm, drawn from the population of small and medium sized enterprises (SMEs) in the business services, legal services and educational services sectors. These industries were selected due to the expected degree of knowledge intensity of firms operating in them. Participants were solicited in two rounds, with the intent to gain access to up to eight sites. It was anticipated that with these eight case sites, there would be sufficient data collected to achieve theoretical saturation, which is the point at which there is minimal incremental learning from each new case (Glaser & Strauss 1967). At each site, semi-structured interviews were conducted with individuals responsible for the functional areas of operations, finance, IS, human resources and marketing and with overall firm responsibility. Depending on the size of the organization, as most were SMEs, this involved between three and seven interviews per site. Thirty-eight interviews lasting between 30 and 90 minutes were conducted, resulting in over 700 pages of typed transcripts. Participants were sent copies of their transcripts to give them an opportunity to clarify or expand discussion points. Secondary data were collected from firm websites and pertinent documents were provided by several of the participating firms.

**Data Analysis**

Qualitative data analysis followed a two-stage analysis procedure, where the first stage involved listening to interviews, indexing contexts, initial coding, and structuring nodes and the second stage involved analysis of resulting nodes and clustering of nodes (Gopal and Prasad, 2000). Three of the main steps in the analysis were coding, within-case analysis and cross-case analysis (Eisenhardt, 1989; Paré, 2004). One full transcript was independently coded by the first and second authors based on a coding guide derived from the construct list. Issues regarding the understanding of codes and types were resolved prior to the first author coding the remaining interviews in NVivo 7. For individual cases, a case summary was written providing key observations on each performance construct and applicable strategy type.
Within-case analysis used a pattern matching strategy, comparing each element of the case against a range of factors related to the hypothesized constructs (Yin, 1994). The last step in the individual case analysis, and the first step in the cross-case analysis, was to convert the thick description into a single level of performance for the constructs and types (Miles & Huberman, 1984). This was done for individual firms and then adjusted as needed as other firms were contrasted. The cross-case analysis involved comparing cases across the within-case analysis dimensions and then examine within-group similarities and between group differences (Eisenhardt, 1989; Miles and Huberman, 1984).

Results

Results reflect the findings from the within and cross-case analyses. The within case analysis of the eight organizations in the sample is presented in Appendices A, B and C, where firm characteristics, performance and strategies are outlined. The alignment hypothesis provides two theoretically-grounded dimensions for differentiation of cases: alignment and performance. Examining the data from the within-case analysis allows for the positioning of the eight cases in a two-by-two matrix consisting of two cases per cell, as illustrated in Figure 3. Results are presented first within-group and then between-group.

**Aligned with high performance.** LegServ and PubLib (see the appendices for details) both showed the theoretically relationship between good alignment and positive performance. Each of the organizations was operating in relatively stable environments, though LegServ was nearing the end of an amalgamation process. Both the legal and the library domains could be considered traditional, however while LegServ embraced this label, PubLib rejected it and sought to create a new image for itself. A major difference was that LegServ appeared to have recognized the benefits of IS to the organization in supporting their processes (Chan, 2000; Tallon, Kraemer & Gurbaxani, 2000).

In comparison to LegServ, CorrEd was only peripherally aware of how they could improve their performance through IS and, as a result, were dabbling in new business lines rather than bringing their IS strategy into alignment. PubLib and ManuServ showed different IS strategies. As an outsourcing firm, ManuServ’s focus on technology to improve efficiency was deliberate and appropriate – their clients hired them because they could perform task more efficiently than if they were left in-house. PubLib had two domains to address – traditional paper-based and Internet-based services – so their balance between servicing their customers in multiple domains required an IS strategy that encompassed both.

**Misaligned with low performance.** CorrEd and ConEng demonstrated the expected theoretical relationship between low alignment and poor performance. Several ConEng senior managers noted that the CEO’s focus on expanding into new business lines was misaligned and a detriment to their performance. Similarly, CorrEd had limited success expanding into areas unrelated to its core business and their Non-Strategic IS strategy was at odds with its otherwise defensively focused knowledge strategy and the business core. In both cases, CEOs’ visions of the firm appeared to be disconnected with the reality of what they could accomplish or should attempt.

CorrEd and DevEd were private entities receiving primarily public funding for the education of a special subset of students in a non-traditional classroom environment. While DevEd consciously left IS out of alignment to focus on knowledge as their key business enabler, CorrEd appeared unaware of the consequences of not developing their IS strategy to match their strategy portfolio. This may suggest that Non-Strategic IS can be a strategic choice if it is consciously made and weighed against other possible strategies, but if drifted into through neglect, then it could be expected to have negative consequences. In another comparison, while ConEng was out of alignment in a stable environment, PubEd was in
alignment in a changing environment. The contrast between these two firms may suggest a degree of tension between internal alignment of strategies and external alignment with environmental factors.

**Aligned with low performance.** PubEd and DistEd both had aligned portfolios, but neither had particularly strong performance. PubEd was in the throes of significant organizational change that may have contributed to the aligned internal strategy portfolio being unsuitable for the environment (Hirschheim & Sabherwal, 2001; Sauer & Burn, 1997). DistEd had so many organizational constraints that each of their individual strategies was non-viable, so while PubEd’s aligned Conservative portfolio was inappropriate for its current circumstances, DistEd’s aligned Non-Viable portfolio was inappropriate under any circumstances.

PubEd used the same Conservative portfolio as did LegServ. However LegServ apparently seized the amalgamation opportunity to modernize with an IS-led change process in the midst of amalgamation, while PubEd deferred such an approach until the organizational change had been implemented, possibly leading to their lower levels of performance (Venkatraman, 1994). DistEd may have aspired to the Conservative portfolio of LegServ, but was unsuccessful in execution. LegServ had clear support for IS-led change in the firm, rewarded knowledge reuse, and had a clear understanding of their clients' needs. In contrast, DistEd suffered from a lack of IS support, found knowledge reuse blocked due to excessive turnover and reacted to client needs in an ad-hoc manner.

**Misaligned with high performance.** DevEd and ManuServ were both high performers whose strategy portfolios were unexpectedly misaligned. These two cases illustrate the concept of strategic misalignment, where strategies are purposefully disconnected for specific reasons: DevEd to force change and ManuServ to gain competitive advantage. DevEd used its misalignment to set the conditions for change within a stagnant organization. ManuServ was quite conscious of the misaligned efficiency focus of IS but felt it was the core of the firm's competitive advantage.

DevEd and PubLib are an example of achieving high performance through very different means. PubLib was fully aligned; DevEd had no component strategies aligned and IS strategy was dominated by business and knowledge strategies. The similarity between the two was that decisions on alignment were consciously made and strategically suited to the industry and environment. ManuServ and ConEng had similar portfolios but with different effects stemming from whether misalignment was intentional or unintentional. In comparison, the CEO of ConEng was apparently unaware of the impacts of expanding the business in his desired manner and how this decision was not supported by the very well-developed IS and knowledge-base supporting the efficient operation of the firm.

**Figure 3**

<table>
<thead>
<tr>
<th>Case Relationship with Theory</th>
</tr>
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<tbody>
<tr>
<td><strong>High Performance</strong></td>
</tr>
<tr>
<td>Aligned</td>
</tr>
<tr>
<td>PubLib</td>
</tr>
<tr>
<td>LegServ</td>
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<tr>
<td>Misaligned</td>
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<tr>
<td>DevEd</td>
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<tr>
<td>ManuServ</td>
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<tr>
<td><strong>Low Performance</strong></td>
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<tr>
<td>PubEd</td>
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<tr>
<td>ConEng</td>
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<tr>
<td>DistEd</td>
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<tr>
<td>CorEd</td>
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</table>
Discussion

The discussion focuses on the development of common themes across the eight cases, framed in terms of comparison between strategy portfolios and outcomes.

Common Themes

Four common themes emerge from the individual and cross case analyses as illustrated in Figure 4: appropriate and inappropriate alignment, conscious and unconscious misalignment, antagonistic alignment and misalignment, and strategic alignment and misalignment.

**Figure 4**

Explanations of Alignment and Misalignment

**Appropriate and inappropriate alignment.** The common difference between the high and low performing firms on the high alignment side of Figure 4 was whether alignment was appropriate or not to the firm’s key external factors. This supported the basic premise of contingency theory, that the firm’s strategy should be aligned to its environment (Prescott, 1986). Both PubLib with its Balanced portfolio and LegServ with its Conservative portfolio understood their environment, considered it in their strategy development and devised an approach that was suitable for it that included strategic alignment. In contrast, PubEd’s selection of a cohesive Conservative strategy was less suitable for the changing environment it faced. Similarly, DistEd’s drifting into a Non-Viable portfolio highlighted the negative effects of multiple ineffective strategies. A common factor was that they maintained internally aligned strategy portfolios that were inappropriate to their external situation (Sauer & Burn, 1997).

**Conscious and unconscious misalignment.** It is apparent that those firms on the low alignment side of Figure 4 that were performing well were conscious of their misalignment – in fact, both DevEd and ManuServ revelled in it. In contrast, those firms that were poorly performing were oblivious to their alignment – both ConEng and CorrEd felt that their strategy portfolios were internally consistent. CorrEd’s unconscious neglect of IS strategy showed a marked contrast to DevEd’s studied dominance of it. ManuServ’s opportunity shaping through efficient delivery of IS and reuse of knowledge was quite different from ConEng’s opportunity seeking being hampered by a rigid document management system and stovepipes of knowledge. Alignment is not necessarily static but rather can be viewed as a continual
and cyclical process, as the natural state of a firm may be for its various elements to be out of alignment, which would explain ConEng and CorrEd’s lack of alignment (Broadbent & Weill, 1993). Similarly, firms that change business strategy may find their change in IS strategy not to be along an ideal trajectory (Hirschheim & Sabherwal, 2001) or their IS strategy to be stagnant (Sauer & Burn, 1997). Strategic orientation of firms may not remain constant, but can change in response to the deployment of IS systems that provide new strategic options to the firm (Segars, Grover & Kettinger, 1994). Finally, this change into and out of alignment may be purposeful and intended to instigate change or achieve competitive advantage in the organization, as seen in DevEd and ManuServ respectively (Sabherwal et al., 2001).

**Antagonistic alignment and misalignment.** In certain cases, alignment and misalignment were negatively related – or antagonistic – to performance. In each case, the selected strategy portfolio was a poor fit to the environment and circumstances of the organization. From DistEd’s dysfunctional but aligned Non-Viable portfolio to CorrEd’s neglect of their IS strategy, these firms made poor selections in their strategy portfolios. Of particular note is the lack of fit between the strategy portfolios and environments of PubEd and ConEng, where static alignment was held in a dynamic changing environment and the opposite. Finally, while internally consistent, DistEd and PubEd’s aligned strategy portfolios are at odds with their environments (Sauer & Burn, 1997). Miller (1992) examined circumstances under which external and internal fit were inconsistent, finding that external fit between the competitive environment and organizational structures did not always coexist with the internal fit between organizational structures and firm processes. He advocated aligning externally first and then internally, a recommendation that would be supported by ConEng and PubEd’s poor performance.

**Strategic alignment and misalignment.** One of the most interesting firm differences was between high performing firms and how they could achieve this level either with or without alignment. All of these firms seemed to understand their environment and how they could best position themselves within it. PubLib and LegServ were aware of the consistency of their various strategies – the CEO of PubLib was quite clear that maintaining balance between strategies was a major challenge and the Director of Modernization for LegServ was very aware that the convergence of structural, process and technology changes in a single office would lead to a consistent and successful implementation. The CEOs of ManuServ and DevEd were equally clear about the benefits of misalignment for their organizations – to generate competitive advantage as a low-cost outsourcing provider for ManuServ and to set the conditions for adaptation and growth in DevEd’s changing environment. This would support Miller’s (1992) contention that in some cases, external alignment may be of greater importance than internal alignment, allowing for business-knowledge-IS strategic misalignment to be consciously selected.

**Conclusion**

Strategic fit is a fundamental concept in management (Venkatraman & Camillus, 1984) to the point that strategy has been defined as “maintaining an effective alignment with the environment while efficiently managing internal interdependencies” (Miles & Snow, 1978, p. 3). Recognizing the balance between internal and external fit, IS researchers in the alignment field have been previously advised to collect environmental contingency factors in order to control for them (Chan & Huff, 1993). This paper has supported and reinforced this warning by demonstrating how environmental factors can influence strategic alignment, providing possible explanations for the mixed findings in this research area (Chan & Reich, 2007). In addition, this paper has extended Miller’s (1992) work by focusing on portfolios of strategies in place of structure and process as elements of internal fit that may be appropriate or inappropriate for external environmental fit. Additionally, it adds to Sauer and Burns’ (1997) work by identifying cases of misalignment that may be beneficial. Finally, the paper integrates these contributions to support the position that misalignment is at times necessary to address the environment (Sabherwal, Hirschheim & Goles, 2001) and extends this work into the knowledge domain.
## Appendix A

### Case Study Firm Characteristics

<table>
<thead>
<tr>
<th>LegServ</th>
<th>PubLib</th>
<th>CorrEd</th>
<th>ConEng</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 600 people supporting four major legal client groups&lt;br&gt;• Ontario-based headquarters with 12 regional offices&lt;br&gt;• Amalgamation used to spearhead modernization&lt;br&gt;• Conservative and tradition-based legal environment&lt;br&gt;• Alignment aided by single IS and modernization portfolio</td>
<td>• Ontario municipal library with five branches and over 100 full-time equivalents&lt;br&gt;• Provided traditional paper-based and electronic services&lt;br&gt;• Shared facilities with cultural and sporting users&lt;br&gt;• CEO viewed library as the community information hub&lt;br&gt;• Technology leader in industry</td>
<td>• Provided education to incarcerated adults&lt;br&gt;• Combined expertise in the teaching and security domains&lt;br&gt;• Small Ontario head office with personnel across Canada&lt;br&gt;• Successful in core business but other initiatives failed&lt;br&gt;• Aim growth into U.S and new mediation business line</td>
<td>• Ontario construction and engineering company&lt;br&gt;• Attempting geographic expansion and diversification into unrelated business lines&lt;br&gt;• Core administrative systems efficiency-oriented&lt;br&gt;• Document management system had codification focus but ignored tacit knowledge</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>DistEd</th>
<th>PubEd</th>
<th>DevEd</th>
<th>ManuServ</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Distance learning arm of a small Ontario university&lt;br&gt;• New initiative that grew rapidly to over 50 staff&lt;br&gt;• Critically under-funded and over 50% annual turnover&lt;br&gt;• Decision making ad-hoc&lt;br&gt;• Insufficient course offerings to allow degree completion&lt;br&gt;• No support from university IS due to residential focus</td>
<td>• Saskatchewan public school district with over 40 primary and secondary schools&lt;br&gt;• Recent amalgamation focused on scale efficiency&lt;br&gt;• Operated in a conservative and traditional field&lt;br&gt;• IS focused more on business administration support than curriculum delivery aid</td>
<td>• Ontario non-profit organization with 130 staff&lt;br&gt;• Provided services for developmental disabilities&lt;br&gt;• Adept at identifying niches and creating new knowledge&lt;br&gt;• Governmental funding drop led to for-profit mentality&lt;br&gt;• Purposefully decoupled alignment to force change&lt;br&gt;• IS strategy incidental to firm</td>
<td>• Outsourced support to automotive manufacturers&lt;br&gt;• Ontario-based with North American client list&lt;br&gt;• Identified underperforming processes in client firms&lt;br&gt;• Efficiency-oriented IS were core to value proposition&lt;br&gt;• IS strategy purposefully held out of alignment with other more aggressive strategies</td>
</tr>
</tbody>
</table>
## Appendix B

### Performance Levels of Case Study Firms

<table>
<thead>
<tr>
<th>Category</th>
<th>LegServ</th>
<th>PubLib</th>
<th>CorEd</th>
<th>ConEng</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Med – Owns no facilities or major assets but has access to very high quality leased assets that meet their needs.</td>
<td>High – Exceeded desired per capita space and distance standards and reconfigured libraries as community space.</td>
<td>Med – Own all and lease part of their headquarters building, but operate from their clients’ facilities.</td>
<td>Med – Equipment is the largest part of the balance sheet and they keep it fully utilized, but it limits their range of tasks.</td>
</tr>
<tr>
<td>Structural</td>
<td>High – Very well developed and codified processes and administrative systems.</td>
<td>High – Processes are very progressive, with e-services being a national leader and exemplar of technology use in libraries.</td>
<td>Med – Adopted procedures of correctional services and processes of continuous entry and exit. Have some difficulties in standardizing processes due to isolation.</td>
<td>Med – They stress process codification, including ISO accreditation, but much knowledge is tacit and there are still isolated pockets.</td>
</tr>
<tr>
<td>Human</td>
<td>Med – Very knowledgeable employees but has threat of near-term high retirement.</td>
<td>High – All librarians have advanced qualifications and there is a very low turnover of personnel.</td>
<td>Med – Employees are disaffected with typical school systems and while pay is lower than in schools, they still have low turnover.</td>
<td>Med – Effort is made to keep talented individuals but the industry has high turnover in general.</td>
</tr>
<tr>
<td>Innovation</td>
<td>High – Encouraged and aided by integration of modernization and IM/IT portfolios.</td>
<td>High – Technology and changing demographics have provided opportunities to innovate.</td>
<td>Low – Limited opportunity to innovate in primary business due to regulations and limited success with new business line development.</td>
<td>Med – Successful in process and IS innovation and have learned much from previous failed attempts.</td>
</tr>
<tr>
<td>Relational</td>
<td>High – Very strong relationship with primary clients and customers.</td>
<td>High – Over 70% of population hold library cards and the library ranked first of all city services.</td>
<td>Med – Have a good reputation with the correctional community, but low-cost bid selection rule limits impact.</td>
<td>Low – Has a reasonable reputation with clients but a poor one with employees.</td>
</tr>
<tr>
<td>Financial</td>
<td>Low – Public organization has sufficient funds to achieve mission but no ability to accrue savings.</td>
<td>Med – Public organization has sufficient funds to achieve mission and is allowed to keep donations and accrue some savings.</td>
<td>Low – Private organization with relatively low profit growth of near 6% and slowing client growth.</td>
<td>Med – Reasonable growth and return on equity for the industry but have limits on market growth in the local area.</td>
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<td></td>
<td>DistEd</td>
<td>PubEd</td>
<td>DevEd</td>
<td>ManuServ</td>
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<tr>
<td>Physical</td>
<td>Low – Infrastructure belongs to the university not the division. Area allotted for future expansion is already insufficient.</td>
<td>Low – Schools are the main assets, but they are rapidly deteriorating. Management is difficult as political issues are tied to divesting assets.</td>
<td>High – Rent headquarters and packing facility but own 12 homes and education facility, with constant growth in assets.</td>
<td>Med – Own the semi-product manufacturing facility and the headquarters building, but operate from their clients’ facilities.</td>
</tr>
<tr>
<td>Structural</td>
<td>Low – Financial and operational management processes are ineffective. Course selection is an ‘adhocracy’ and IS support is haphazard and minimal.</td>
<td>Med – Amalgamation led to uneven processes across the district. Conscious effort to adopt best practices and learning versus teaching focus.</td>
<td>Med – Up to date policies and processes and are becoming accredited. Have developed new processes to help specific disabilities.</td>
<td>High – Competence in real-time process control and labour management, including both procedures and supporting IS.</td>
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<tr>
<td>Human</td>
<td>Low – Academics are not part of the division. Annual staff turnover is over 50%; so much expertise routinely leaves the organization.</td>
<td>Med – Wide range of abilities in over 500 teachers. Evaluations are conducted to support teachers and improve teaching.</td>
<td>High – Learning culture with education and training opportunities provided including professional certification. Low turnover.</td>
<td>High – Majority of revenues come from knowledgeable supervisors and the core staff which participate in each start up activity.</td>
</tr>
<tr>
<td>Innovation</td>
<td>Low – Partnerships account for much innovation due to the inability to get internal support. Most effort is focused on attaining minimum service standards.</td>
<td>Low – Consolidating what amalgamation has brought together is the focus, but they have started putting structures in place to support future innovation.</td>
<td>High – Constant search for new services for existing clients and for opportunities to expand clients. Specific rewards given for research, innovation and creativity.</td>
<td>High – Combine software and cost control expertise to create outsourcing solutions for their clients. CEO states “I create a different way of doing business.”</td>
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<tr>
<td>Relational</td>
<td>Med – There are good relationships with external agencies and adequate ones with academics and students.</td>
<td>Med – There is some positive feedback from the community but many still resent amalgamation.</td>
<td>Med – Very good relations with ministries, families of clients and employees, but only fair with community.</td>
<td>High – Firm has never lost a contract and relationship with clients enables them to expand services offered.</td>
</tr>
<tr>
<td>Financial</td>
<td>Low – Revenues are not retained and the budgeting system is inflexible, causing loss of resources.</td>
<td>Low – The challenge is managing a dispersed area with steadily declining enrolment and thus funding.</td>
<td>Med – Revenues and allocations are adequate, but the switch to individual funding will be a challenge.</td>
<td>High – Entrepreneurial outlook focuses on high margin opportunities that reuse core capabilities.</td>
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</table>
## Appendix C

### Business, Information Systems and Knowledge Strategies of Case Study Firms

<table>
<thead>
<tr>
<th>Category</th>
<th>LegServ Defender</th>
<th>PubLib Analyzer</th>
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</table>
| **Business**      | little desire to expand range of services  
cost control is very important  
researched the efficacy of their services with surveys  
decision making takes extended period of time and requires cooperation of all stakeholders  
very strong understanding of their core services | view library as community information and culture hub  
defend paper-based services against bookstores and e-services against search engines  
balance existing and expanding services and clients  
statistical analyses of service standards and performance  
efficiency is a concern but still seek new opportunities  
forefront of provincial e-services vision since 1990 |
| **Information Systems** | amalgamation allowed reduction of duplication  
implemented standardized networks and docking stations to facilitate travel between sites  
uses other organizations' precedent to implement new technology  
acquisition of a case management system is efficiency driven  
firm is improving services to their existing clients for existing services | amalgamation of basic IT infrastructure operations and maintenance enabled focus on information services  
community information hub view emerged in early 1990s and has been followed ever since  
focus more on operational IS services than administrative support  
implemented “a new integrated library system”, RFID and internal wikis for youth  
developed and marketed their own open-source software that supports their electronic services |
| **Knowledge**     | amalgamation allowed identification of best practices  
modernization focus on improving selected best practices  
rely on front-line employees to examine process  
implemented formal modernization committees  
major cross-training and succession planning initiatives  
legal domain processes are legislated so focus is on codification | both exploit existing internal knowledge and explore for new external knowledge  
well networked with libraries and other professional  
librarians are aware of diverse knowledge sources  
innovative knowledge strategy ingrained into operations  
information is encouraged to flow freely in firm  
recombine existing knowledge to create new services |
<table>
<thead>
<tr>
<th>Business</th>
<th>CorrEd Analyzer</th>
<th>ConEng Analyzer</th>
<th>DistEd Reactor</th>
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</thead>
</table>
| • stable domain is correctional education where they compete effectively
• very good understanding of costs but do not undercut
• previously branched out into curriculum development for health with low success
• currently attempting expansion in both geographically (to U.S.) in correctional education business and in adding a new mediation business line | • CEO noted that reducing costs and finding new opportunities “go together”
• “efficiency is #1 … you don’t want to do anything twice”
• growth from $55M mining, crushing and roads to $80M in a wider range of sectors
• geographic growth from northern to southern Ontario
• CEO is pro-diversification but divisional managers see significant risks | • “curriculum decisions have been complete ad-hocracy”
• trying to analyze their performance, but are not yet aware of the linkages
• not drawing the best students, as “if they are really high-end, then they’re not our students”
• recognition that the level of support they can provide their students may be less than that of competitors |

<table>
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<tr>
<th>Information Systems</th>
<th>Non-Strategic IS</th>
<th>IS for Efficiency</th>
<th>Non-Strategic IS</th>
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</thead>
</table>
| • very little investment in IS infrastructure or strategy
• rudimentary administrative IS systems and no operational ones supporting development or delivery
• very limited use of IS to scan the environment
• little recognition of how IS could contribute to firm effectiveness | • main IS are a customized accounting information system (AIS) and a document management system (DMS)
• operational support system provides integrated production support
• document management system is designed for information and knowledge capture
• Suffers from indexing problems and system functionality supporting innovation has been limited | • strategy is based on efficiency, but it is poorly executed
• “We are very information systems poor.”
• financial management system and student information system are both geared to in-house student requirements, excluding distance students’ needs
• information is largely not captured or “it tends to end up in spreadsheets across the institution, carefully guarded” |

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<tr>
<th>Knowledge</th>
<th>Exploiter</th>
<th>Exploiter</th>
<th>Loner</th>
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</table>
| • small headquarters with much tacit corporate knowledge
• training relies on both transfer of codified procedural knowledge and tacit mentoring
• isolation poses significant challenges in knowledge distribution
• success is based on combining educational and correctional knowledge
• attempting to expand knowledge area into unrelated mediation area | • focus on codification and transfer of explicit knowledge is seen in DMS, where all information is entered
• reuse has been seen in moving development knowledge from one bridge project to another
• DMS indexing issues have limited retrieval of knowledge
• limited recognition of the importance of tacit knowledge | • inward looking in knowledge strategy due to poor information management practices
• “we would have reluctance to share – not because we’d be afraid of giving away our trade secrets or competitive advantage, but because we might look like idiots”
• residential focus of the university overshadowed distance education needs
• internal knowledge focus, an opportunistic capture process and limited reuse |
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<th>DevEd Analyzer</th>
<th>ManuServ Analyzer</th>
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<tbody>
<tr>
<td>“Education is naturally conservative because everybody’s gone to school”</td>
<td>“core is residential and non-residential services to individuals with behavioural and developmental issues”</td>
<td>“we’re very focused on perfecting and improving what we’re currently doing but certainly we always have to be looking to the future and what else can we do”</td>
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<tr>
<td>efficiency in provision of their core services is a key concern as they have finite resources available to them</td>
<td>CEO has an entrepreneurial outlook</td>
<td>relationship focus versus transactional one and positioned more on quality than cost</td>
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<tr>
<td>strategy evolution is oriented to refining and providing different means for delivering core programs</td>
<td>maintains a wide range of operations, where certain parts of the organizations work on a business model to fund other parts of the organization</td>
<td>analyzes customers’ needs and expanding their service offerings to provide efficient outsourcing for those needs</td>
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<tr>
<td>performance review is a high priority where assessment is focused more on correction than expansion</td>
<td>created a new niche business area around a particular disability, starting with a client and expanding into a regional resource</td>
<td>“in the business of whatever my customers need if I can make money at it”</td>
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<td>“moved the IS function off the teacher’s shoulders and hired IS professionals that specialize in various IS areas”</td>
<td>IS used for supporting administration within the firm</td>
<td>IS at the core of their value - “the reason that [we] exist is because information systems are making visible areas of cost control that weren’t visible before”</td>
<td></td>
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<tr>
<td>technology can mitigate the impact of distance linking “41 schools over about 12,000 square miles”</td>
<td>e-mail was lately implemented and until very recently it did not cover all parts of the organization, reducing effectiveness</td>
<td>efficient information distribution enables effective control - “We were developing business applications to support our workforce in terms of what they need to be more efficient”</td>
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<tr>
<td>development of tools to support special interest groups and improving communications within the extensive area</td>
<td>IS and information are viewed as unrelated to client care</td>
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<td>resistance to automation of client care</td>
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<td></td>
<td>CEO purposefully did not fully invest in IS</td>
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<thead>
<tr>
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<th>Explorer</th>
<th>Innovator</th>
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<tbody>
<tr>
<td>more focused on improving existing services than creating new ones</td>
<td>revitalized older programs and integrated new knowledge to make them more effective through external links</td>
<td>routinely bring together teams of subject matter experts to develop new capabilities</td>
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<tr>
<td>reuse and leveraging of internal knowledge to address amalgamation issues</td>
<td>rewards recognizing innovation, teaching and research among other service areas</td>
<td>“we choose new processes to the industry... we didn’t invent them but we took them into that industry”</td>
<td></td>
</tr>
<tr>
<td>source of much knowledge is internal and is based on education as a profession and teachers as professionals</td>
<td>acquired knowledge to develop handbook, run conference, train staff and open a residential treatment facility for a disorder</td>
<td>both learn internally and partner with others to acquire knowledge</td>
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</tr>
<tr>
<td>attempts to codify knowledge for reuse</td>
<td>focused on identifying and absorbing external knowledge to bring into the field</td>
<td>reuse core knowledge of scheduling and real-time control to create new knowledge</td>
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<td>newly amalgamated organization has variegated knowledge</td>
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