Ideal patterns of strategic alignment and business performance

François Bergeron*, Louis Raymondb, Suzanne Rivardc

*Département des systèmes d'information organisationnels, Faculté des sciences de l'administration, Université Laval, Québec, Que, Canada, G1K 7P4.

bDépartement des sciences de la gestion, Université du Québec à Trois-Rivières, Trois-Rivières, Que, Canada.

cDépartement des technologies de l'information, HEC-Montréal, Côte Ste-Catherine, Montréal, Que, Canada.

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Abstract

Strategic alignment or "fit" is a notion that is deemed crucial in understanding how organizations can translate their deployment of information technology (IT) into actual increases in performance. While previous theoretical and methodological works have provided foundations for identifying the dimensions and performance impacts of the strategic alignment between IT, strategy, and structure, few attempts have been made to test the proposed theory empirically and operationalize fit systemically. Based on a gestalt perspective of fit and theory-based ideal coalignment patterns, an operational model of strategic alignment is proposed and empirically validated through a mail survey of 110 small firms. Using cluster analysis, it was found that low-performance firms exhibited a conflictual coalignment pattern of business strategy, business structure, IT strategy, and IT structure that distinguished them from other firms.

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1. Introduction

The trend toward globalization and virtualization of the business environment remains unabated and has spawned profound transformations, both internal and external, as most organizations must re-create their value chain and strive for closer relationships with their customers and business partners. In response to or anticipation of changes in their environment, most organizations are deploying information technology (IT) at an increasing rate. Thus, it has raised a fundamental question underlying these transformations: how can an organization actually translate its IT investments into increased business performance, be it in terms of productivity, increased market share, profitability or other indicators of organizational effectiveness?

Given the complex nature of this question, some researchers surmised that the answer would be predicated upon adopting a contingency theory perspective, whereas IT would influence business performance to the extent that it would be in "alignment" or "fit" with the strategic, structural, and environmental dynamics specific to each organization. Assuming there is no single best way to invest in IT, theoretical IS contingency frameworks have been proposed, purporting to describe and explain the impact of alignment upon performance. At the empirical level, some
authors have examined the relationship between strategic and IT management, and between organizational and IT structure. However, studies that have actually operationalized alignment and demonstrated its effect upon organizational performance have been few and far between. Adopting a definition of fit as gestalt, our study examined the impact of the coalignment between business strategy, business structure, IT strategy, and IT structure on business performance in 110 small and medium-sized firms.

2. Theoretical background

The notion of strategic alignment originates from a body of conceptual and empirical work in the organization literature whose fundamental proposition is that organizational performance is the consequence of fit between two or more factors such as strategy, structure, technology, culture, and environment [13]. The contingency relationship that has received the most attention has been the one between organizational strategy and organizational structure [16]; this has been studied extensively in large and small manufacturing and service firms (e.g. [29,31]).

The fundamental view of fit propounded by strategic management researchers and organization theorists is that it involves a search for aligning the organization with its environment and arranging resources to support that alignment [45]. As strategy is the force that mediates between the firm and its environment, it is, in practical terms, the basic alignment mechanism, and the organizational structure must be well suited to it if a significant competitive advantage is to be created. Firms whose strategy and structure are aligned should be less vulnerable to external change and internal inefficiencies and should thus perform better.

Information processing in the context of organizational decision making and uncertainty was used as a framework for better understanding of the fit between strategy and structure [73]. Strategic change creates the need for more information and greater information gathering, interpreting, and synthesis capabilities, which in turn lead to changes in structure [30]. This approach is thus based on the assumption that organizations will be more effective when there is a match between the information-processing requirements of their strategy and their information-processing capacities.

As shown in Table 1, the principal aim of organizational contingency studies was to identify congruent patterns of strategy and structure, expressed by coupling strategic and structural dimensions such as diversification and centralization. For instance, it was found that an increasing level of product diversity leads multinational corporations to choose a product division rather than a functional division structure [33].

Other organization studies have attempted to relate the information-processing requirements and capacities associated with strategic and structural choices. For instance, a worldwide product division structure is meant to satisfy the greater requirements for product related information processing by facilitating information flows between the head office and the subsidiaries [26]. Conversely, the more extensive information-processing capacity associated with greater structural integration (e.g. through the presence of liaison devices and professional staff) encourages diversification in that it provides managers with more time and objectivity to perceive business opportunities (e.g. through environmental scanning) [61].

The information-processing requirements of an organization are translated into an IT strategy. Researchers have conceptualized this notion in various ways. For instance, IT strategy can be seen as a four-dimensional construct, including competencies, role of IT, systems design and development, and infrastructures [21], whereas the strategic orientation of IS focuses on the firm’s application portfolio as a mirror of its business strategic orientation along dimensions of aggressiveness, analysis, defensiveness, futurity, proactiveness, risk aversion, and innovativeness [15].

The organization's information-processing capacity is reflected in its IT structure. This concept has been conceptualized mostly along three dimensions. The first is the IT organizational architecture dimension, which comprises the locus of responsibility of the IT function and the degree of decentralization of the IT organizational structure [11,12]. The second is the technological architecture dimension, encompassing the degree of application and data integration, standardization of the technology, and the nature of hardware deployment [27,28,36,42]. The third is the process and skills dimension, which includes planning
mechanisms and the standardization of application development and implementation approaches [1].

IS researchers have looked essentially at two types of bivariate fit relationships, one being between business and IT strategy, the other being between business and IT structure. In this body of work, some researchers have been primarily interested in determining whether such relationships exist [4,41,64,70], whereas others see fit as a goal to reach, and focus on finding how to define the IT strategy or design the IT structure in order to align them with the business strategy or business structure [43,53,59,65,71,72]. Finally, others see fit as emerging through joint and mutual adjustments between business strategy or structure, and IT strategy or structure [19,44,49].

While several authors have adopted a contingency perspective to describe and study the relationship between organizational and IT strategy and structure, only a small number have empirically examined the impact of the fit between these alignment domains and organizational performance. Table 2 summarizes the studies, including the form of fit conceptualized in each.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Alignment domains</th>
<th>Form of fit</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Business strategy</td>
<td>Business structure</td>
<td>IT strategy</td>
</tr>
<tr>
<td>Bergeron and Raymond, 1995</td>
<td>X</td>
<td>X</td>
<td>Mediation</td>
</tr>
<tr>
<td>Teo and King, 1996</td>
<td>X</td>
<td>X</td>
<td>Mediation*</td>
</tr>
<tr>
<td>Chan et al., 1997</td>
<td>X</td>
<td>X</td>
<td>Matching</td>
</tr>
<tr>
<td>Palmer and Markus, 2000</td>
<td>X</td>
<td>X</td>
<td>Matching</td>
</tr>
<tr>
<td>Sabherwal and Chan, 2001</td>
<td>X</td>
<td>X</td>
<td>Profile deviation</td>
</tr>
<tr>
<td>Croteau et al., 2001</td>
<td>X</td>
<td>X</td>
<td>Covariation</td>
</tr>
</tbody>
</table>

* Univariate measure.
3. Research model

Each prior study focused on a single pair of alignment domains of a single type. That is, studies examined the impact on performance of the fit either between business strategy and IT strategy or between organization structure and IT structure. However, contingency theorists argue that a holistic, rather than a bivariate conceptualization of fit, has greater explanatory power because of its ability to retain the complex and interrelated nature of the relationships between constructs [77]. Applied to the present context, adopting a holistic approach would mean that the impact of the fit between all four alignment domains on firm performance must be examined.

Such holistic conceptualizations of fit are found in the IS literature. For instance, the importance of aligning external and internal business domains (business strategy and organizational infrastructure and processes) with external and internal IT domains (IT strategy and IT infrastructure and processes) has been stressed [35]. More recently, a framework within which the four alignment domains are taken into account has been suggested [63]. As shown in Table 3, this framework defines six alignment types, each corresponding to a bivariate fit; that is, one of the six possible arrangements of two alignment domains among the four. For each alignment type, theoretical patterns of alignment are derived from the literature and depend on the constructs used to assess each alignment domain. The six alignment types constitute the company's strategic IT management profile.

Borrowing from research on fit and misfit with multiple contingencies [32], this framework posits that a given strategic IT management profile could be in conflict, not in conflict, or neutral. A conflict situation is one where misalignment dominates; that is, where the number of poorly aligned alignment types is greater. A non-conflict situation would be the opposite, while a neutral situation would be one where the number of appropriately aligned and poorly aligned types is the same. Based on this framework, the following general proposition can be tested:

**Proposition:** Conflicting coalignment patterns of business strategy, business structure, IT strategy, and IT structure will exhibit lower levels of business performance.

Central to this proposition is the notion of coalignment, which is based on the premise that we ought to address, simultaneously, the many contingencies in the research model. This approach is preferred to bivariate perspectives of fit, which, by examining how pairs of context and design factors interact to explain performance, are said to be reductionist and dysfunctional [24]. Another assumption of coalignment is equifinality, which recognizes that numerous equally effective alternatives may exist [74]. As shown in Fig. 1, the research model adopts a perspective of fit as gestalt, looking “simultaneously at a large number of variables that collectively define a meaningful and coherent slice of organizational reality” [46].

Theoretical patterns of alignment depend on the constructs used to assess each alignment domain, and there exist as many potential alignment patterns as combinations of values for each alignment domain. Assuming that each of the model's four alignment constructs can take three values—high, moderate, or low level—there would be a total of 81 (3^4) potential alignment patterns. Given the nature of the constructs selected for this study, and as suggested by the literature and summarized in Table 4, a high degree of alignment for each of the six alignment types would be characterized by similar values for both elements of the alignment type component. Consequently, overall

<table>
<thead>
<tr>
<th>Alignment type</th>
<th>Alignment domain 1</th>
<th>Alignment domain 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business alignment</td>
<td>Business strategy</td>
<td>Business structure</td>
</tr>
<tr>
<td>Strategic alignment</td>
<td>Business strategy</td>
<td>IT strategy</td>
</tr>
<tr>
<td>Structural alignment</td>
<td>Business structure</td>
<td>IT structure</td>
</tr>
<tr>
<td>IT alignment</td>
<td>IT strategy</td>
<td>IT structure</td>
</tr>
<tr>
<td>Cross-dimensional alignment 1</td>
<td>Business strategy</td>
<td>IT strategy</td>
</tr>
<tr>
<td>Cross-dimensional alignment 2</td>
<td>Business strategy</td>
<td>IT structure</td>
</tr>
</tbody>
</table>

Table 3: Strategic IT management profile—alignment types
alignment would be considered non-conflictual if the number of “high” alignment types was larger than the number of “low” ones. If the number of “low” alignments was larger than the number of “high” ones, overall alignment would be considered as in conflict. Finally, if the number of “high” and “low” alignments were the same, overall alignment would be neutral. As shown in Table 4, there would be three “ideal” patterns, that is, ones where all four alignment constructs take the same value. Also, the “worst” patterns in terms of conflict are those where only the two cross-dimensional alignments are “high”.

4. Methodology

4.1. Sample and data collection

A cross-sectional survey was conducted, with a target population consisting of 1000 small and medium-sized enterprises (SMEs). Half were manufacturing firms listed in Dun and Bradstreet’s Directory [25] and the other half were service firms listed in Scott’s Directory [67]. In order to be selected, a firm had to have between 10 and 300 employees, and annual sales under $50 million. So as to obtain a representative sample, firm selection followed a systematic sampling procedure—a firm picked at random from the first \( k \) units and every \( k \)th unit thereafter [18,40]. The questionnaire was pre-tested during interviews with five small business CEOs. The pre-test led to minor modifications only.

The questionnaire was faxed to the CEO (or a representative manager) of each selected firm. Respondents were asked to fill out the questionnaire and to send it back, preferably by fax, to a toll-free 1-800 number. One week later, a reminder was faxed to all selected firms. Two weeks after the first faxing, follow-up phone calls were made to a sample of 293 CEOs who had not yet returned their questionnaire. The main reasons invoked for not participating were: an internal policy not to participate in surveys, time constraints, too many solicitations to answer surveys, and privacy concerns. Given the length of the questionnaire, the dislike of owner-managers for anything that smacks of bureaucracy or red tape is here a more plausible cause for non-response than the characteristics of the sample or the nature of the question under study [3].

One hundred and fifty-one questionnaires were returned, for a gross response rate of 15%. Out of these, a total of 41 questionnaires were eliminated for various reasons: they were incomplete, or they were received from organizations that did not have a computer system, had less than 10 employees, or had revenues above $50 million. The final response rate was 11%; this was to be expected as response rates in the 10–15% range are typical in small business survey

<table>
<thead>
<tr>
<th>Alignment type</th>
<th>Ideal pattern</th>
<th>Ideal pattern</th>
<th>Ideal pattern</th>
<th>Worst pattern</th>
<th>Worst pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic alignment (strategy—IT strategy)</td>
<td>H (H-H)</td>
<td>H (M-M)</td>
<td>H (L-L)</td>
<td>L (L-H)</td>
<td>L (H-L)</td>
</tr>
<tr>
<td>Structural alignment (structure—IT structure)</td>
<td>H (H-H)</td>
<td>H (M-M)</td>
<td>H (L-L)</td>
<td>L (L-H)</td>
<td>L (L-H)</td>
</tr>
<tr>
<td>IT alignment (IT strategy—IT structure)</td>
<td>H (H-H)</td>
<td>H (M-M)</td>
<td>H (L-L)</td>
<td>L (L-H)</td>
<td>L (L-H)</td>
</tr>
<tr>
<td>Characterization of overall alignment</td>
<td>6H no conflict</td>
<td>6H no conflict</td>
<td>6H no conflict</td>
<td>4L 2H conflict</td>
<td>4L 2H conflict</td>
</tr>
</tbody>
</table>
research [39]. The participating firms operate in a variety of sectors including manufacturing (49.1%), wholesale/distribution (24.4%), services (11.4%), and others (15.1%). The average firm in the sample has 54 employees, and an average IS budget of $84,000. The respondents were: CEOs (63.9%), vice-presidents (7.1%), directors of finance (15.0%), other managers (13.3%). The sample is fairly representative of Canadian SMEs in terms of size and sector.

4.2. Measurement

The measures of business strategy, business structure, and business performance were taken from the strategic management, organization theory, and small business management literature. The measures of IT strategy and IT structure were developed for the purposes of this study.

4.2.1. Business strategy

For the purposes of the study, the construct of strategic orientation of business enterprises was adopted to assess business strategy. This construct refers to realized as opposed to intended strategy, focuses on the “resource deployment patterns” that firms adopt to reach their desired goals, is defined at the level of the business unit, and adopts a holistic rather than a functional perspective. Strategic orientation comprises six underlying dimensions: aggressiveness, analysis, defensiveness, futurity, proactiveness, and riskiness. It was measured using the STROBE instrument [75]. Twenty-nine items rate the firm’s strategies on 7-point scales, tracing its course of action in terms of the six dimensions. This instrument was previously used and partly validated in two studies of strategic alignment [8].

4.2.2. Business structure

The structural dimensions most commonly found in organization theory and IS studies include specialization, vertical differentiation, professionalization, formalization, and centralization [20]. Specialization (or horizontal differentiation) was measured by the number of distinct job titles in the organization chart [54]. The number of levels in the firm’s hierarchy below the chief executive level assessed vertical differentiation (the Aston studies [56]). The percentage of professional staff members in the firm indicated professionalization [48] whereas formalization was measured by the extent to which rules, procedures, and activities are written. Centralization is indicated by the ratio of managers to total employees, commonly referred to as the firm’s administrative intensity or managerial hierarchy [9].

4.2.3. IT strategy and IT structure

The firm’s IT strategy includes: the type and range of its systems and capabilities, the systemic competencies that play a role in the creation of new business strategies or better support existing ones, and the IT governance mechanisms selected to provide the required capabilities. The components of the firm’s IT structure are management processes and skills; i.e. the managerial activities and competencies that are aimed at effectively and efficiently building an IT architecture and deploying IT resources in the organization [69]. The constructs of IT strategy and IT structure were measured with an instrument developed and validated as the first step of this study.

The IT strategy construct included two dimensions. The first, IT environment scanning [38, 51, 55], represents to what extent the firm has the capability of detecting and reacting to technological changes relative to its competitors. The second, strategic use of IT [10, 11], represents to what extent it uses IT to increase its quality, competitiveness, and performance. The IT structure construct is also bidimensional. It has one dimension relating to IT planning and control [7, 14], namely how well the firm manages its IT function, resources, and infrastructure relative to its competitors. Another dimension, IT acquisition and implementation [57, 60], relates to how well the firm manages the selection and introduction of new IT applications.

A list of 66 items related to the preceding four dimensions was developed from a review of the literature. Following a Delphi-based procedure [52], the list was submitted to 26 small firm CEOs (half manufacturing, half services), asking them to indicate which were most critical to their firm. A final list was obtained by retaining the 29 issues mentioned by more than one respondent, as presented in Appendix A. The constructs of IT strategy and IT structure were measured by having the respondents indicate the extent to which an item constituted a strength or a weakness for their firm, relative to their competition. Note that this approach lessens bias on the respondents’ part in that
they are not asked to rate the firm in absolute terms against an ideal, but rather to compare it with others; this is easier to do from both a cognitive and affective standpoint.

4.2.4. Business performance

Management research has defined performance from a variety of perspectives [78]. The business performance perspective was selected here. It includes indicators such as return on sales, return on capital, and profit per share, as well as non-financial indicators such as market share or new product development. In order to remain consistent with our definition of business strategy, wherein business performance is seen as "the long-term well-being and strength of the enterprise relative to its competitors", business performance is defined along two dimensions: growth and profitability relative to the competition [79]. The growth dimension takes into account the notion of "long-term well-being" while the profitability dimension embeds the notion of strength.

Strategic management researchers have proposed a subjective approach to measure business performance [22, 47]. Such an approach is most appropriate in a small business context where financial data is often unavailable or unreliable [66]. The business performance instrument was previously validated in a small business context and deemed appropriate for the present study [58]. The CEO was asked to indicate on a 7-point Likert scales how his or her firm performed relative to the competition during the last 5 years on two dimensions (growth and profitability), in terms of sales growth rate, market share gains, net profit, ROI, return on sales, and financial liquidity. The descriptive statistics of the research variables are presented in Table 5.

Table 5
Descriptive statistics of the research variables (n = 110)

<table>
<thead>
<tr>
<th>Alignment domains measures</th>
<th>Mean</th>
<th>Median</th>
<th>S.D.</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business strategy (strategic orientation)&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggressiveness</td>
<td>4.08</td>
<td>4.25</td>
<td>1.18</td>
<td>1.25</td>
<td>6.25</td>
</tr>
<tr>
<td>Analysis</td>
<td>5.68</td>
<td>5.83</td>
<td>0.90</td>
<td>1.67</td>
<td>7.00</td>
</tr>
<tr>
<td>Defensiveness</td>
<td>5.52</td>
<td>5.75</td>
<td>1.07</td>
<td>2.00</td>
<td>7.00</td>
</tr>
<tr>
<td>Futurity</td>
<td>5.14</td>
<td>5.30</td>
<td>1.15</td>
<td>1.00</td>
<td>7.00</td>
</tr>
<tr>
<td>Proactiveness</td>
<td>4.75</td>
<td>4.80</td>
<td>0.99</td>
<td>2.20</td>
<td>6.80</td>
</tr>
<tr>
<td>Business structure (formal complexity)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formalization&lt;sup&gt;b&lt;/sup&gt;</td>
<td>4.00</td>
<td>4.00</td>
<td>1.75</td>
<td>1.00</td>
<td>6.00</td>
</tr>
<tr>
<td>Administrative intensity&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.11</td>
<td>0.09</td>
<td>0.07</td>
<td>0.01</td>
<td>0.47</td>
</tr>
<tr>
<td>Professionalization&lt;sup&gt;d&lt;/sup&gt;</td>
<td>0.09</td>
<td>0.03</td>
<td>0.14</td>
<td>0.00</td>
<td>0.71</td>
</tr>
<tr>
<td>Specialization&lt;sup&gt;e&lt;/sup&gt;</td>
<td>3.09</td>
<td>3.00</td>
<td>1.83</td>
<td>1.00</td>
<td>9.00</td>
</tr>
<tr>
<td>Vertical differentiation&lt;sup&gt;f&lt;/sup&gt;</td>
<td>2.96</td>
<td>3.00</td>
<td>0.85</td>
<td>1.00</td>
<td>5.00</td>
</tr>
<tr>
<td>IT strategy&lt;sup&gt;g&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT environment scanning</td>
<td>5.38</td>
<td>5.33</td>
<td>0.95</td>
<td>3.00</td>
<td>7.00</td>
</tr>
<tr>
<td>Strategic use of IT</td>
<td>5.88</td>
<td>6.00</td>
<td>0.94</td>
<td>2.69</td>
<td>7.00</td>
</tr>
<tr>
<td>IT structure&lt;sup&gt;h&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT planning and control</td>
<td>5.35</td>
<td>5.44</td>
<td>0.93</td>
<td>2.00</td>
<td>7.00</td>
</tr>
<tr>
<td>IT acquisition and implementaion</td>
<td>5.42</td>
<td>5.44</td>
<td>0.94</td>
<td>3.11</td>
<td>7.00</td>
</tr>
<tr>
<td>Performance measures</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth</td>
<td>4.71</td>
<td>4.83</td>
<td>1.31</td>
<td>1.33</td>
<td>7.00</td>
</tr>
<tr>
<td>Profitability</td>
<td>4.64</td>
<td>4.60</td>
<td>1.21</td>
<td>1.60</td>
<td>7.00</td>
</tr>
</tbody>
</table>

<sup>a</sup> 7-point scales.
<sup>b</sup> Extent to which rules, procedures, and activities are written.
<sup>c</sup> Number of managers/number of employees.
<sup>d</sup> Number of professionals/number of employees.
<sup>e</sup> Number of distinct job titles in the organization chart.
<sup>f</sup> Number of organizational levels below the chief executive.
5. Results

Structural equation modeling was used to assess the measurement model, using an EQS technique [6]. The validity of the research constructs was assessed from an estimation and respecification of the measurement model by confirmatory factor analyses [2].

5.1. Assessment of construct validity

Using the data from the 110 small firms sampled, maximum likelihood (ML) estimates of the measurement model's parameters (standardized factor loadings, correlations, error variances, and the \( \chi^2 \) goodness-of-fit statistic) were obtained from the EQS program [5]. The primary question here was to determine the unidimensionality of the constructs, so that they could then be related within the coalignment model.

As shown in Figs. 2–6, the constructs were shown to be reliable and valid overall. For the business strategy construct, namely strategic orientation, the riskiness dimension was found to be unreliable, however, as indicated by Cronbach's \( \alpha \) coefficient, thus it had to be removed for the EQS program to obtain convergence. The weak loading also indicated that aggressiveness would not be a constitutive element of strategic orientation as initially posited. Again, this is in line with an earlier finding that both aggressiveness and riskiness did not correlate significantly with any of the other four dimensions, but only with each other.
Given this last result, it was decided to delete both riskiness and aggressiveness from the measurement model in order to ensure the unidimensionality of the strategic orientation construct.

For the business structure construct, both centralization and professionalization initially loaded below the 0.5 level. The problem here was the heterogeneity of a sample composed in equal parts of small manufacturing and service firms, as relationships involving centralization and professionalization differed between these two sectors of activity. As a result, the measurement model was respecified by deleting the two indicators that did not work out as planned, thus restricting the assessment of the firm's business structure to its formal complexity.

5.2. Test of the research proposition

As it is the most appropriate way to examine it from a gestalt perspective, cluster analysis was used to test the research proposition of the study [76]. This approach groups organizations so that their membership is homogeneous with respect to certain characteristics. Here, the characteristics (or clustering
variables) are the four components of coalignment: business strategy, business structure, IT strategy, and IT structure. A second aim is that each group differs from others with respect to the same characteristics. Given this study’s focus on multivariate coalignment, Ward’s hierarchical clustering method was used, as it forms groups by maximizing within-group homogeneity (i.e. within-cluster sum of squares), thus producing groups that are compact [68].

A four-cluster solution was found to be most parsimonious in identifying groups of firms that could be clearly distinguished from one another, based on a meaningful pattern of relationships among the four clustering variables [34]. Three and five-cluster solutions were also discarded on the basis of clustering statistics that evaluate the consequences of forming a new cluster at any given step, such as the root-mean-square standard deviation (RMSSTD) that measures the homogeneity of the cluster formed.

Table 6 presents the means and standard deviations of the clustering variables for each of the four clusters.

One-way analysis of variance (ANOVA) was used to evaluate the equality of variable means across the clusters and thus assess the distinctiveness of each derived cluster. The $F$-tests presented on the bottom line confirm that these means differ significantly across the four groups for all four clustering variables. Added tests of significance of pairwise contrasts (Duncan’s multiple range test) indicate certain similarities however. Clusters 1 ($n = 31$) and 4 ($n = 26$) did not differ with regards to business strategy, IT strategy, and IT structure, but did differ significantly in business structure. Also, clusters 2 ($n = 34$) and 3 ($n = 19$) are not distinguishable in terms of IT strategy.

To present these results in summary form, the group mean of each clustering variable was categorized as “high” (H), “moderate” (M), and “low” (L). Thus, clusters 3 and 4 appear to be the most internally congruent while the other two are less so. Firms in group 4 are characterized by a business strategy with a strong strategic orientation, a complex structure, a

<table>
<thead>
<tr>
<th>Clustering variable</th>
<th>Business strategy (strategic orientation)</th>
<th>Business structure (formal complexity)</th>
<th>IT strategy</th>
<th>IT structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster</td>
<td>Mean</td>
<td>S.D.</td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>Four groups of firms obtained from hierarchical cluster analysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 ($n = 31$)</td>
<td>5.6 a</td>
<td>M</td>
<td>0.5</td>
<td>2.8 c</td>
</tr>
<tr>
<td>2 ($n = 34$)</td>
<td>5.1 b</td>
<td>M</td>
<td>0.5</td>
<td>3.8 b</td>
</tr>
<tr>
<td>3 ($n = 19$)</td>
<td>4.3 c</td>
<td>L</td>
<td>1.1</td>
<td>2.0 d</td>
</tr>
<tr>
<td>4 ($n = 26$)</td>
<td>5.9 a</td>
<td>H</td>
<td>0.6</td>
<td>4.4 a</td>
</tr>
<tr>
<td>All ($n = 110$)</td>
<td>5.3</td>
<td>0.8</td>
<td>3.4</td>
<td>1.1</td>
</tr>
<tr>
<td>F (ANOVA)</td>
<td>24.4**</td>
<td></td>
<td>26.1**</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clustering variable</th>
<th>Growth</th>
<th>Profitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cluster</td>
<td>Mean</td>
<td>S.D.</td>
</tr>
<tr>
<td>Breakdown of growth and profitability by cluster</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 ($n = 31$)</td>
<td>5.2 a</td>
<td>H</td>
</tr>
<tr>
<td>2 ($n = 34$)</td>
<td>4.3 b</td>
<td>M</td>
</tr>
<tr>
<td>3 ($n = 19$)</td>
<td>4.1 b</td>
<td>M</td>
</tr>
<tr>
<td>4 ($n = 26$)</td>
<td>5.1 a</td>
<td>H</td>
</tr>
<tr>
<td>All ($n = 110$)</td>
<td>4.7</td>
<td>1.3</td>
</tr>
<tr>
<td>F (ANOVA)</td>
<td>5.0*</td>
<td></td>
</tr>
</tbody>
</table>

Within columns, different letters indicate significant (at $P < 0.05$) pairwise differences on Duncan’s multiple range test.

* $P < 0.01$.
** $P < 0.001$. 

*Mean in upper (high)/middle (moderate)/lower (low) third percentile (33%) of the total sample.
Table 7
Characterization of the clusters by type of alignment

<table>
<thead>
<tr>
<th>Alignment type</th>
<th>Cluster 1</th>
<th>Cluster 2</th>
<th>Cluster 3</th>
<th>Cluster 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic alignment (strategy-IT strategy)</td>
<td>M (M-H)</td>
<td>L* (M-L)</td>
<td>L* (L-L)</td>
<td>H (H-H)</td>
</tr>
<tr>
<td>Structural alignment (structure-IT structure)</td>
<td>M (M-H)</td>
<td>L (H-L)</td>
<td>H (L-L)</td>
<td>H (H-H)</td>
</tr>
<tr>
<td>IT alignment (IT strategy-IT structure)</td>
<td>H (H-H)</td>
<td>H (L-L)</td>
<td>H (L-L)</td>
<td>H (H-H)</td>
</tr>
<tr>
<td>Cross-dimensional alignment 1 (structure-IT strategy)</td>
<td>M (M-H)</td>
<td>L (L-L)</td>
<td>L* (L-L)</td>
<td>H (H-H)</td>
</tr>
<tr>
<td>Characterization of overall alignment</td>
<td>2H 4M no conflict</td>
<td>1H 2M 3L conflict</td>
<td>4H 2L no conflict</td>
<td>6H no conflict</td>
</tr>
</tbody>
</table>

a “Non-strategic” IT has “low” alignment with any level of strategic orientation.
b “Non-strategic” IT has “low” alignment with any level of formal complexity.

The analysis of the results leads us to generally accept the research proposition that conflictual coalignment patterns of business strategy, business structure, IT strategy, and IT structure will exhibit lower levels of business performance. There are, however, particularities that must be discussed. Out of the four groups of organizations (Groups 1-4), three of them (Groups 1, 3, and 4) show non-conflicting patterns, and one group (Group 2) exhibits a conflicting pattern. Following our proposition, Groups 1, 3 and 4 should all be associated with firms exhibiting higher performance in terms of growth and profitability. This is true for Groups 1, and 4, but not for Group 3 which has a non-conflicting alignment associated with lower performance. Group 2, showing a conflictual pattern, conforms to the research proposition by being associated with lower performance.

6. Discussion

strong IT strategy, and a sophisticated IT structure; i.e. an “H–H–H–H” pattern. The opposite is true of Group 3 whose members are not strategically oriented, have a simple structure, a weak IT strategy, and a basic IT structure; i.e. an “L–L–L–L” pattern. Group 1 firms differ from those in Group 4 in that their structure was of moderate complexity, and their strategic orientation was of moderate to high strength; i.e. an “M–M–H–H” pattern. Group 2 firms differed from those in Group 3 in that their strategic orientation was moderate and their structure complex; i.e. an “M–H–L–L” pattern that is the least congruent of the four.

The central proposition of this study was that certain alignments or patterns of strategy, structure, IT strategy, and IT structure would outperform others in terms of business growth and profitability. Thus, one-way ANOVAs were used to test for performance differences across the four clusters. An F-test indicated that group means significantly differed across groups for both performance measures. Added tests of significance of pairwise contrasts (Duncan’s test) indicated that Groups 1 and 4 were similar in achieving high-performance, with the former showing high levels of growth and profitability and the latter being also composed of high-growth firms with a moderate to high level of profitability, whereas both Groups 2 and 3 were composed of firms whose growth and profit performance was only moderate.

Each of the four clusters was then characterized following the alignment framework shown in Table 3. This characterization was synthesized in Table 7. First, the level of alignment was assessed for each of the six alignment types. Second, when the number of “high” (H) alignments was larger than the number of “low” (L) alignments, overall alignment was considered to be high and characterized as a “no conflict” alignment. When the number of “low” alignments was larger than the number of “high” alignments, overall alignment was considered to be low and was labeled “conflict”.

6.1. Strong performers

Group 4 is the one that shows the greatest coalignment among the four clustering variables since each variable is rated as high (H). In Group 4, all variables were highly related and aligned. These organizations displayed important characteristics. First, they acted strategically in spending time and money to analyze
large amounts of data on their past and present performance, trying to identify tendencies and predict the future, and being proactive relative to new markets and new products or services. Second, they adopted a complex organization structure where tasks were highly formalized, specialized, and vertically differentiated. Third, their IT strategy put much emphasis on environment scanning and on the strategic use of IT so that their portfolio of IT applications was fully justified in terms of profitability, cost-effectiveness, and organizational priorities. Finally, associated with high levels of growth and profitability in Group 4 was an IT function structured such that IT personnel followed systematic and comprehensive development methods for the implementation and management of IT, completing "by the book" each of the steps of planning, acquisition or development, implementation, and control.

Another group that showed a non-conflictual pattern of coalignment was Group 1, a group that performed as well as Group 4, even though its level of congruence between the four alignment domains was not as high. Group 1 showed a high level of business alignment although the organizations in this group displayed on average only a moderate level of strategic orientation matching a moderate level of structural complexity. In comparison to Group 4, they spent less time analyzing their business data, searching for explanations for variations in growth and profitability, developing scenarios of the future, or searching for the "killer" product or service. Accordingly, their structure was only moderately formalized, with only a little specialization and some vertical differentiation. IT alignment was strong in Group 1, with high nominal levels of IT strategy and IT structure. These organizations were very similar to Group 4 in their way of scanning their environment, emphasizing the strategic use of IT and adopting a highly structured process in managing IT.

Group 1 showed only moderate levels of congruence in terms of the four other types of alignments, these being strategic alignment, structural alignment, and the two cross-dimensional alignments. The moderate strategic alignment results formed a mismatch between the business strategy, which was at a moderate level, and the IT strategy, which had a high level. At first glance, this situation could seem somewhat counter-intuitive, since one might think that the IT strategy should support the business strategy, and not the other way around. However, this was previously observed in a study, where business strategy and strategic IT management showed mutually moderating effect in relation to performance [8]. In this case we had a group of organizations where the IT personnel was eager to find and implement profitable IT applications for the business, whereas this was only a moderate concern for the organization as a whole. Structural alignment was also at a moderate level in Group 1 where the IT function was well structured, as reflected in the managers' use of comprehensive project management methods whereas the business structure was only of moderate complexity. Given these results, the two cross-dimensional alignments were also at a moderate level. Hence, alignment domains were not perfectly coaligned; still, there were not so misaligned as to inhibit business growth and profitability. Given Group 1's overall characterization as being non-conflicting, added credence was thus given to the validity of the research proposition.

6.2. Moderate and weak performers

While Groups 1 and 4 were both strong performers, Groups 2 and 3 were not. Group 2 presented a conflictual coalignment situation, given that of six possible alignments, one was high (IT alignment), two were moderate (business alignment and the strategy-IT structure cross-alignment), and three others were low. The low nominal levels of IT strategy and structure played a major role. Their moderate to low levels of congruence with business strategy and structure domains characterized coalignment as being conflictual overall. As firms in Group 2 were not strong performers on average, this again provided empirical support for the research proposition.

The last group, Group 3, was a most interesting one, since it seemed to contradict the research proposition. Yet it was composed of firms that were not strong performers. Indeed, with low nominal levels for all four alignment domains, four types of alignments end up as high and two as low. On the one hand, it was a surprise to find so many firms (nearly 30% of the sample) showing minimal levels of strategic orientation, structural complexity, IT strategy, and IT structure. Their status as small and medium-sized enterprises (SMEs) might be the reason why this
was so. On the other hand, the other 70% were also SMEs. Thus, one had to wonder why the former did not perform as well as the latter in terms of growth and profitability since they did display a non-conflicting coalignment pattern. A similar result was reported and analyzed in a prior study, indicating that the “low–low” coalignment pattern of strategic orientation and strategic IT management was less plausible a priori and less effective empirically in explaining performance than the “high–high” pattern, contradicting the bivariate “matching” alignment perspective. More recently, using a bivariate “profile deviation” alignment perspective, no significant relationship was found between coalignment and performance for organizations whose strategic activities were minimal in terms of aggressiveness, proactiveness, and analysis [62]. It was concluded that “the importance of aligning IS strategy and business strategy may not be as universal as previously believed”. Using a multivariate gestalt approach, the results of the present study leads one to conclude that using the fit between business dimensions and IT dimensions to explain performance is valid only if organizations have attained minimum thresholds on all four alignment domains; i.e. are not systematically at the low end of the spectrum.

7. Implications

In reconciling our research findings with previous theoretical and empirical work, potential implications can be drawn. Having lent empirical credence to the concept of coalignment and its relationship with performance impact, this study has some implications for researchers. First and foremost, coalignment constitutes a valid theoretical foundation on which to further investigate the fundamental IT problem for organizations, namely how to achieve value from ever-increasing IT investments. On a methodological basis, the gestalt perspective seems effective in its capacity to describe, predict, and explain the performance of IT.

This research also has prescriptive implications for managers and IS practitioners. When shifts in the business environment, both external and internal, require strategic choices or provide strategic opportunities, resulting changes must be inter-linked and assessed continually across all four of these domains in a systemic manner if the firm wants better performance. The coalignment approach thus transcends both strategic integration (bivariate fit between business strategy and IT strategy) and operational integration (bivariate fit between business structure and IT structure) to achieve “systems” integration and increase performance.

When strategic orientation is the driving force, management must see to it that its formulation of a new or enhanced business strategy is simultaneously implemented in two forms, one being the formulation of an appropriate IT strategy (how IT can be used to support strategic objectives and satisfy information needs), the other being the design of an organizational structure with the appropriate levels of formalization and differentiation. The newly designed IT strategy and structural configuration in turn require an appropriate IT infrastructure in the form of enhanced IT planning, acquisition, implementation, and control processes.

For instance, a small textile manufacturing firm whose business strategy is formulated in terms of lowering production costs and increasing productivity executes this strategy through an integrative IT strategy based on ERP software [23]. If this firm is to achieve performance gains, implementing such an application would entail conforming to the software’s underlying business model (e.g. R/3 in the case of SAP), usually requiring added formalization of the organizational structure, if not added horizontal and vertical differentiation. And the successful planning and execution of such an inherently complex project would obviously require more in terms of the small firm’s IT management competencies.

Alternatively, when IT strategy is the enabling force, management seeks to determine how emerging IT capabilities can be used to enhance the firm’s strategic orientation. With information obtained from scanning the IT environment, management should envision the potential competitive uses of IT to adapt the firm’s business strategy, with new or expanded strategic thrusts in the form of product/service differentiation and innovation, and new or expanded strategic targets in the form of growth and strategic alliances. Such changes also require a corresponding adaptation of IT structure to analyze and meet the increasing needs of both internal and external IS customers. The newly emerging business strategy
and increased service level required of the IS management function may, in turn, require that the firm's structure be improved by creating support units and new staff positions.

For instance, a small maker of interactive industrial kiosks, operating in "make-to-order" production mode, sees an opportunity in being the first in its industry to develop a commercial web site [17]. To translate this choice into higher performance levels, the firm's business strategy would have to be adapted for the resulting sales growth. Also, IT management would now have to plan, implement, and evaluate inter-organizational IS to provide pre- and post-sales service to on-line customers (customer-relationship management), and to strengthen links with business partners (supply-chain management). This in turn would imply creating a better adapted structure to enable the small firm to respond to changes in its environment.

8. Limitations and conclusion

This study has attempted to define the concept of strategic alignment and demonstrate the influence of this complex managerial process on business performance. Given such an endeavor, the research findings have inherent limitations. The most significant resides in the range of constructs developed to represent strategic alignment. When compared with IT strategy and IT structure found in the literature, only some aspects of complexity have been captured here. Other alignment domains not present, such as environmental uncertainty, must later be included. Also, given that coalignment is an emergent process that continues to change after it has been achieved, a longitudinal rather than cross-sectional investigation would have provided deeper knowledge and truer confirmation of causal relationships.

Another limitation pertains to a possible response bias associated with survey research, particularly the use of a single organizational informant. Multiple informants and triangulation of collected data ideally provide more accurate measures of organizational properties. However, given that the sampled organizations are small businesses [37,50], entrepreneurs or owner-managers "embody" their organization and are thus the best-placed, if not the only individuals, to provide valid and accurate data on their business strategy, IT strategy, and business performance.

Finally, while most empirical studies on strategic IS and alignment have been conducted in large, technologically sophisticated organizations, such as Fortune 1000 manufacturing or service firms, this survey was targeted at small manufacturing and service firms. As such, no claim for external validity and generalization of the results beyond the sampling frame can be made. Small businesses constitute an investigation terrain that is initially more amenable and comprehensive, making it more feasible for researchers to take a systems approach in developing and testing a valid operational model of strategic alignment.

In an economic context that has become fundamentally globalized and virtualized, business enterprises must leverage IT in order to transform themselves into "intelligent" and "agile" organizations, continuously adapting and changing in a process of strategic alignment or fit. Of increasing importance is research that provides more rigorous measurement, more accurate description, and better explanation of this process and its impact on organizational effectiveness. While previous theoretical and methodological works have provided a solid foundation for identifying the dimensions and performance impacts of strategic alignment, and for conceptualizing fit, few attempts have been made to empirically test proposed theory and operationalize fit systemically. As a further step, this study has framed IT strategy and IT structure within the larger framework of organizational strategy and structure to provide a richer view of strategic alignment and how it contributes to business performance.

Appendix A. Items measuring IT strategy and IT structure dimensions

A.1. IT environment scanning

1. Using an external information network to identify your requirements in information technology.
2. Knowing the information technology used by your competition.
3. Instituting a technology watch in order to change rapidly your information technology when necessary.
4. Ensuring that your choice of information technology follows the evolution of your environment.
5. Using the information technologies that will permit a rapid reaction to environmental pressure.

A.2. Strategic use of IT

1. Use of IT to reduce your production costs.
2. Use of IT to make substantial savings.
3. Use of IT to improve your firm's productivity.
4. Use of IT to increase your firm's profitability.
5. Use of IT to improve the quality of products or services.
6. Use of IT to respect the deadlines requested by your customers.

A.3. IT planning and control

1. Mastering current information technology products.
2. Maintaining control over projects involved with the acquisition of new technology.
3. Being considered as a leader in information technology usage.
4. Development of a technological culture in your firm.
5. Having the required human and organizational resources to manage the information systems.
6. Having the ability to effectively identify and fill your needs in information technology.
7. Strategic planning of information systems in relation to the organization’s business objectives.
8. Mastering the technology presently in use in your organization.
9. Using a distributed system to share information within the firm.

A.4. IT acquisition and implementation

1. Structured approach to acquire the needed information systems.
2. Use of specific selection criteria for the acquisition of new information systems.
3. Using financial tools in planning the acquisition of new information systems.
4. Choosing information technology related to the strategic orientation of your firm.
5. Knowing the impact that IT will have on the different functions of your firm.
6. Evaluating potential problems related to the strategic orientation of your firm.
7. Knowing the results of a financial feasibility study before the acquisition of IT.
8. Identification of possible sources of resistance to change before implementation.
9. Evaluating the employee’s aptitude to use the chosen IT.

References


François Bergeron is professor of information technology and electronic commerce at Université Laval, Québec. He holds a PhD from the Anderson School of Management, UCLA, and an MBA and an MSc in economics from Laval. His areas of research are in business and IT strategy, IT management, and electronic commerce. Professor Bergeron is the author of six books and one CD-ROM on IT Management and electronic commerce strategy. This is his fifth publication in information & management. His research has been published in several other international journals including the Journal of Strategic Information Systems, Omega, Data Base, MIS Quarterly, Journal of Small Business Management, and, in French, Revue Internationale PME and Revue internationale de Gestion.

Louis Raymond, PhD, professor of information systems at the Université du Québec à Trois-Rivières, is titular of the Canada Research Chair on Enterprise Performance. He has published in various journals such as the Journal of Management Information Systems, the MIS Quarterly, Entrepreneurship Theory and Practice, Information & Management, and Decisions Support Systems and in international proceedings such as the International Conference on Information Systems. His research interests include the alignment of IT and business performance, particularly in the context of small enterprises and network organizations.
Suzanne Rivard is professor of information technology and holder of the Chair of Strategic Management of Information Technology at HEC Montréal. She received a PhD from the Ivey School of Business, the University of Western Ontario. Dr Rivard's research interests are in the areas of outsourcing of information systems services, software project risk management, strategic alignment of information technology, and the adoption of information technology. Her work has been published in journals such as Communications of the ACM, Canadian Journal of Administrative Sciences, Data Base, Information and Management, Journal of Management Information Systems, and MIS Quarterly, and others.