

**Enabling the business strategy of SMEs through e-business capabilities:
A strategic alignment perspective**

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Abstract

SMEs face pressures from an increasingly competitive business environment. They are called upon to implement strategies enabled and supported by information technologies and e-business capabilities. Based upon the Internet and Web technologies, these capabilities are identified in the form of e-communication, e-commerce, e-intelligence and e-collaboration. From a contingency theory perspective, and using survey data obtained from 107 Canadian manufacturing SMEs, this study examines the alignment of e-business capabilities with business strategy, based on Miles and Snow's strategic typology. The performance outcomes of this alignment in terms of growth, productivity and financial performance are also examined. Results indicate that the ideal e-business profiles vary in the relation to the firms' strategic orientation, whether it is of the Defender, Analyzer or Prospector type.

1. Introduction

E-business is now a standard in industry. In Canada for instance, more than 45 % of firms possess an e-business capability in one form or the other, up 3 % in the last three years (Statistics Canada, 2007). A number of business activities such as communicating, transacting, environmental scanning and collaborating with other organisations are now done through the Internet and the World-Wide-Web. However, the choice of e-business capabilities that firms must develop could be critical to their success. The complexity of technological choices, implementation difficulties, personnel training costs and the continuous updating of systems demand that organisations target their e-business activities upon their business strategy. The issue of information technology's (IT) *alignment* with the firm's business strategy constitutes one of the five main problems faced by IT managers in large enterprises (Luftman, Kempaiah and Nash, 2006).

But what about small and medium-sized enterprises (SMEs), and especially in the manufacturing sector given these organisations' specificities at the strategic and operational levels, including

their dependency upon certain business partners such as large prime contracting firms (Dangayach and Deshmukh, 2001)? Is the strategic alignment of their e-business activities as critical? Does this alignment allow manufacturing SMEs to perform better in terms of growth, productivity, and profitability? Since IT alignment with business strategy has been shown to significantly contribute to the business performance of SMEs (Chan and Horner Reich, 2007a), the alignment of e-business activities on business strategy should also be of the utmost importance for these organizations.

Based on survey data obtained from 107 Canadian SMEs, the present study aims at a deeper understanding of the alignment between e-business and business strategy in terms of Miles and Snow's (1978) recognised strategic typology that includes Prospectors, Analyzers, and Defenders. The first of the three objectives of this research is to identify the consequences of e-business alignment for the organisational performance of manufacturing SMEs. The second objective is to verify if these consequences are valid for all types of business strategies or only for some of these. And finally, this research aims at determining what e-business capabilities would be most appropriate for each type of business strategy. The research question is then formulated as follow: *Can SMEs enhance their performance by aligning their e-business activities with their business strategy?*

2. Theoretical and empirical context

The study's theoretical and empirical context is constituted by IT alignment research that is founded upon contingency theory. The notion of strategic alignment emanates from strategic management and organisation theory research whose fundamental proposition is that organisational performance is a consequence of the coherence or "fit" between two or more factors such as strategy, structure, and technology (Burns and Stalker, 1961). In this perspective, coherence is a dynamic search that seeks to align the organization with its environment and to organize resources internally in support of this alignment (Miles and Snow, 1984, p. 11). Given that strategy is the mediating force between the firm and its environment, it constitutes in concrete fashion the basic alignment mechanism, and the organization's technology, Internet and Web-based technology here, must be compatible with this strategy if a significant competitive advantage is to be created.

2.1 Strategic Alignment of E-business

Two research perspectives can be taken to examine how e-business alignment creates value for the firm (Amit and Zott, 2001). The first perspective reflects a market power imperative, and viewing the firm as a bundle of strategic activities aimed at attaining a competitive position in the market in response to environmental forces (Porter, 1980). In an e-business context, it is best exemplified by Porter (2001) who sees the Internet as a means by which firms can gain competitive advantage by altering the competitive forces that collectively determine industry profitability. E-business capabilities can contribute to this alteration of competitive forces by contributing to either lowering costs or enhancing differentiation. The second perspective, the resource-based view of the firm, conceptualizes the enterprise as a bundle of resources and dynamic capabilities that are inherently valuable, thus contending that the firm's strategy should in essence be defined by its unique resources and capabilities (Barney, 1991; Teece, Pisano and Shuen, 1997). In an e-business context, this perspective sees e-business capabilities themselves as a source of competitive advantage (Bharadwaj, 2000).

A number of studies have shown that strategic alignment between IT and the business strategy plays a significant role in explaining business performance (Chan and Horner Reich, 2007a). Generally speaking, these studies define alignment as the extent to which IT activities and capabilities support business strategy (Chan and Horner Reich, 2007b). While researchers contend that e-business should be pursued as a strategic initiative (Hackbarth and Kettinger, 2000; Chang, Jackson and Grover, 2003; Azumah, Koh and Maguire, 2007) and thus propose e-business planning models (Kao and Decou, 2003; Burn and Ash, 2005; Ferguson and Yen, 2007), there have been as of yet very little conceptualisation and empirical investigation of e-business alignment and its effect on organizational performance in both SMEs and large enterprises.

2.2 E-Business Capabilities

The development of e-business capabilities in the organisation can come in different forms. The most frequent is in the form of "e-communication", referring to the promotion of the firm, its products and services, including brochureware, online catalogs, and other types of Internet uses

(i.e., intranets and extranets) and Web sites designed to communicate with customers and employees (Turban, Lee, King and Chung, 2000). The second form is “e-intelligence” (sometimes called e-business intelligence) wherein the nature and breadth of information now available on the Internet allow the firm to scan its technological, commercial and competitive environment in search of ways and means to improve its operations and decision-making, and seek new product-market opportunities (Hill and Scott, 2004). The third form of e-business development, namely “e-commerce”, is of a transactional nature, and is still rather difficult to implement successfully, for SMEs in particular. It concerns the buying and selling of goods and services through the Internet and Web-based technologies (Rayport and Jaworski, 2001). Another manner in which e-business can be applied is “e-collaboration”. It consists in integrating and sharing, through the Internet or extranets, information on the extended value chain linking the firm with its upstream and downstream business partners. This allows stakeholders within the same industry or network organisation that share the same objectives to collaborate in the design, development, production and management of products and services at different stages of their life-cycle (Cassivi, Lefebvre, Lefebvre and Léger, 2004).

The four types of e-business capabilities can be classified under two dimensions, one horizontal the other vertical. Based on the business processes they are meant to support, e-communication and e-intelligence would be viewed as informational, whereas e-commerce and e-collaboration would be viewed as relational (Amit and Zott, 2001). From a different perspective, a classification of e-business capabilities based on the managerial and decision support level would place e-communication and e-commerce at the operational level, whereas e-intelligence and e-collaboration would be placed at the strategic level (Karagozoglu and Lindell, 2004).

2.3 Business Strategy Types

While many definitions of business strategy can be found in the literature, Porter’s (1980) perspective will be adopted here, wherein strategy is constituted by offensive and defensive actions undertaken to counter competitive forces and thus provide the firm with an increased return on its investment. Approaches to identifying a business strategy can be textual, multivariate, or typological (Hambrick, 1980). The typological approach is recognized as creating a better understanding of the strategic reality of an organization, since all types of

business strategy are viewed as having particular characteristics but a common strategic orientation.

While several typologies have been proposed (e.g., Ansoff and Stewart, 1967; Freeman, 1974, Porter, 1980), the most frequently used in empirical research is Miles and Snow's (Zahra and Pearce, 1990). With regard to business strategy, Miles and Snow (1978) typology has been the most recognized and widespread classification scheme for the last twenty-five years (DeSarbo, Di Benedetto, Song and Sinha, 2005). A firm is thus classified as a Prospector to the extent that it is innovative in introducing new technologies and seeking new markets, as a Defender if it is engineering-oriented and aims to maintain its position in a relatively stable market, or as an Analyzer if it adopts a "second but better" orientation based on a trade-off between the minimisation of risk and the maximisation of business opportunities. Being applicable independently of the industrial sector (Hambrick, 1983), this typology has been validated and used in numerous empirical studies, including some in the context of SMEs (e.g., Aragón-Sánchez and Sánchez-Marín, 2005; O'Regan and Ghobadian, 2005).

Note that Miles and Snow's (1978) typology initially included a fourth type, namely *Reactor*, that is, enterprises that do not demonstrate any coherent business strategy. As was later done by Miles and Snow (1984) themselves and as is done in most empirical studies that have used this typology, Reactors are excluded from the present study (Delery and Doty, 1996; Sabherwal and Chan, 2001).

2.4 Research Model on E-business Alignment

The research model underlying the present study is presented in Figure 1. In enabling firms to create value and sustain competitive advantage, different strategic capabilities, and IT capabilities in particular, are clearly related to different strategic types (DeSarbo *et al.*, 2005). There is thus reason to believe that different e-business capabilities would be appropriate for each type of business strategy, that is, for Defenders, for Analyzers, and for Prospectors. As defined by Miles and Snow (1978), many aspects of their typology can be affected by the firm's e-business strategy, including the Defenders' emphasis on operational efficiency in terms of production and sales costs, the Prospectors' need for innovation in terms of product and market

development, and the Analysers' need for flexibility to balance both operational efficiency and innovation.

----- Figure 1: Research model on the strategic alignment of e-business in SMEs -----

Manufacturing SMEs whose business and e-business strategies are aligned should be less vulnerable to changes in their business environment and to internal inefficiencies. They should also perform better as Internet and Web-based technologies provide the systems and support the processes required to successfully implement their business strategy, focused on the development of networks, products and markets.

In line with previous research results on the strategic alignment of IT (Bergeron, Raymond and Rivard, 2004), one can surmise that a high level of alignment between the manufacturing SME's e-business capabilities and its business strategy demonstrates that the use of Internet and Web-based technologies and applications is targeted on its competitive needs and its strategic priorities, and thus allows it to increase its performance. Thus the following research hypothesis:

H1: Greater alignment of e-business capabilities with business strategy is associated to greater performance.

Note that with regard to organisational performance, the research model includes two proximal indicators, that is, growth and productivity, directly related to the e-business capabilities, and one distal indicator, that is, profitability. And whereas organisational size can play a potentially determining role in the e-business development and the performance of manufacturing SMEs (Sadowski, Maitland and Van Dongen, 2002; Yang, Yang and Wu, 2005), this factor will be included as a control variable in the research model. Apart from its size, the firm's age or organizational lifecycle may come into play as younger firms generally face higher information costs and financing constraints (Hartarska and Gonzalez-Vega, 2006), which may also influence their capacity to invest in e-business (Chan and Lin, 2007). Industry effects are seen to explain in part the heterogeneity of SMEs with regard to performance and strategic behaviour (Mauri et Michaels, 1998), and also with regard to e-business capabilities (Piscitello and Sgobbi, 2004; Coltman, Devinney and Midgley, 2007). A competitive force that also comes into play, for

SMEs especially, is related to the power of customers, as large prime contractors or important customers may impose strategic behaviour upon these firms (Freel, 2000), including e-business technologies such as EDI (Raymond and Bergeron, 1996). The underlying hypothesis is that size, age, industry and power of customers will have a moderating effect on the relationship between e-business alignment and performance.

Inferred from the attributes of Miles and Snow's typology and the implications of this typology for the development of e-business in manufacturing SMEs, the ideal e-business alignment profiles for Defenders, Analyzers and Prospectors are presented in Table 1. The profile deviation approach for measuring alignment is the most appropriate approach in this context (Sabherwal and Chan, 2001)

----- Table 1: Ideal e-business profile for each type of business strategy -----

Defenders are organisations that concentrate their effort into relatively secure niches within their industry. They usually engage in little or no development of new products, services and markets. These firms compete primarily on the basis of operational effectiveness with low-cost, high quality products, speed of delivery and quality of service, and obtain efficiency by relying on economies of scale (Hambrick, 1983; Doty, Glick and Huber, 1993). Defenders invest in equipment and infrastructure but make limited use of technologies. As such, given their strategic objectives, their use of technologies will likely be targeted toward the integration of inter and intra-firm manufacturing processes in order to rationalize their production and distribution costs, improve their productivity and increase their customers' satisfaction. These objectives can be attained by the use of technologies such as EDI and ERP for internal and external value chain efficiency (Markus, 2000). The e-business capabilities that would best support this type of business strategy, given their basic function, are e-communication and e-commerce, whereas e-intelligence and e-collaboration capabilities would not be supportive in this regard. Thus, from a strategic alignment perspective, the "ideal" e-business profile of the Defender is assumed to include e-communication and e-commerce capabilities. Defenders who have developed these two capabilities should obtain greater business performance than Defenders who have not done so or have instead implemented other types of e-business capabilities.

H2: For Defenders, a better alignment with their ideal e-business profile is associated with a better performance.

Analyzers share some common characteristics with Defenders and Prospectors, being oriented toward operational effectiveness and increased production in stable markets (like Defenders) but also, to some extent, in more turbulent environments (like Prospectors) (Slater and Narver, 1993). Analyzers try to optimize their business activities by analysing their market, their past and projected performance, and minimising risk, a task that can be partly supported by business intelligence. They are less aggressive and pro-active than Prospectors but more than the Defenders. On one hand, Analyzers must maintain a complete and efficient line of products that have been proven successful on the market, which requires intra- and inter-organisational integration. This can be supported by e-communication and e-commerce capabilities. On the other hand, they also try to benefit from occasional or emerging product/market opportunities, that can be explored through e-intelligence capabilities, and that require both product innovation and (production and distribution) process innovation. Their potentially conflicting needs for both competitiveness and operational effectiveness would drive Analyzers to exploit technologies that increase the flexibility of their production and distribution processes, and thus allow them to benefit from increased demand for their products (Beach *et al.*, 2000). The e-business capabilities that would support this type of business strategy are e-communication, e-commerce, and e-intelligence. Thus assuming that the ideal e-business profile includes these three capabilities, it is hypothesised that Analyzers who have developed all of these will perform better than those who have not done so, or have only developed one or two of these capabilities, or have developed an e-collaboration capability instead.

H3: For Analyzers, a better alignment with their ideal e-business profile is associated with a better performance.

SMEs of the Prospector strategic type are focused on developing new products and new markets. They frequently change their product line and compete primarily by seizing new market opportunities (Hambrick, 1983). Investing in research and development, these firms continuously innovate and regularly launch new products/services (O'Regan and Ghobadian, 2005). Prospectors adapt to a turbulent business environment by emphasising environmental scanning

(Daft and Weick, 1984), a function that is supported by e-intelligence. Experimenting with a larger number of technologies, they employ more complex coordination and communication mechanisms, and rely on participative and decentralized decision-making. Prospectors can thus count on e-communication for such purposes. Their strategic priority would be the technologies that improve their innovation capacity but also those that increase their flexibility and reduce their new products' time-to-market (Aragón-Sánchez and Sánchez-Marín, 2005), this objective being well-suited for e-commerce. As these firms benefit from collaborating with partners in the design of new products and services (Lee and Chang, 2007), an e-collaboration capability would be very appropriate for them, while it would be less important for Analyzers and not required by Defenders. Thus, it is assumed that the Prospectors' ideal e-business profile would include e-communication, e-commerce, e-intelligence and e-collaboration, hypothesising in this last case that all four types of e-business capabilities will jointly contribute to improving organisational performance.

H4: For Prospectors, a better alignment with their ideal e-business profile is associated with a better performance.

3. Research method

The research data were obtained from the XXXTM database¹ created by a university research center, containing information on 307 Canadian manufacturing SMEs. With the collaboration of an industry association to which most of these firms belong, the database was created by allowing them to participate in a benchmarking exercise, that is, by having the firms' chief executive and functional executives such as the controller, human resources manager, and production manager fill out a questionnaire to provide data on the practices and results of their firm and add their firm's financial statements for the last five years. In exchange for these data, the firms were provided with a complete comparative diagnostic, that is, their overall situation was benchmarked in terms of performance and vulnerability (further information on the diagnosis system and on data collection and validation can be found in Yyyy and Zzzz, 2006).² One year later, 107 of these firms renewed the benchmarking exercise, and in so doing, answered

¹ Not named at this stage to preserve the authors' anonymity in the reviewing process

² Reference not included at this stage to preserve the authors' anonymity in the reviewing process

a second questionnaire on their use of the Internet and the Web. Data from the initial questionnaire were also updated on this occasion.

Annual sales of the sampled organisations vary from 1.4 million \$ (CAD) to 55 million, with a median of 7.6 million. Approximately 40 % of these firms are small (19 to 49 employees), whereas the others are medium-sized (50 to 336 employees), the median being 60 employees. More than 15 manufacturing sectors are present, including metal products, wood, plastics and rubber, electrical products, food and beverage, and machinery. A total of 27 SMEs (25 %) operate in a sector whose technological intensity is low, 66 (62 %) in a medium to low-tech sector, and 14 (13 %) in a medium to high-tech sector (OECD, 2005). There are no high-tech firms.

Following a self-classification approach previously used (James and Hatten, 1995; O'Regan and Ghobadian, 2005) to identify the firm either as a Prospector, Defender, Analyzer or Reactor, it was asked of the CEOs to choose among the following statements the one that best described their business strategy (the strategic type, not mentioned in the original questionnaire, is included here for the benefit of the reader):

- I continuously innovate and regularly launch new products/services (*Prospector*).
- My first goal is to maintain my current market share with existing products/services by lowering their price or increasing their quality (*Defender*).
- I rely primarily on existing products, while I cautiously introduce products or services that have already been proven successful on the market (*Analyzer*).
- I am quite satisfied with the current situation. I will revise the price or quality of my products or eventually introduce new products or services only if my firm is facing a major threat that endangers its survival (*Reactor*).

E-business capabilities are measured by asking CEOs to indicate the business activities for which the Internet (including intranets and extranets) and the Web are used in their organisation. The nine activities proposed are grouped under four categories, namely e-communication, e-commerce, e-intelligence and e-collaboration. This categorisation corresponds to various levels of e-business development observed in previous studies (Raymond et Bergeron, 1996; Kula et Tatoglu, 2003; Levy et Powell, 2003; Xu, Zhu et Gibbs, 2004), and adapted to the SME context. The firm is considered to have attained a particular level (dichotomous variable) if it uses the

Internet and the Web for in at least one of the business activities associated to that level, that is, for each of the four categories.

Organisational performance is assessed from growth, productivity and profitability indicators commonly employed in strategic management research (Venkatraman, 1989a). Thus growth is evaluated by the average growth in net sales over the last 3 years. The productivity of labour is measured by the gross margin per employee. And profitability is indicated by the return on assets (ROA).

Alignment is hence conceptualised and measured from a “profile deviation” perspective (Venkatraman, 1989b), that is, the less Defenders, Analyzers and Prospectors deviate from their “ideal” e-business profile (as defined in Table 1), the better will be their performance. Following the method used by Sabherwal and Chan (2001), values of 1 and 0 are assigned as ideal values (yes and no), the measure of alignment being calculated from the euclidean distance between the firm’s actual strategic profile and its ideal profile, for each type of business strategy:

$$\text{Alignment}_{\text{Defender}} = 1 - \left[[e\text{-Communic.} - 1]^2 + [e\text{-Commerce} - 1]^2 + [e\text{-Intelligence} - 0]^2 + [e\text{-Collab.} - 0]^2 \right]^{1/2}$$

$$\text{Alignment}_{\text{Analyzer}} = 1 - \left[[e\text{-Communic.} - 1]^2 + [e\text{-Commerce} - 1]^2 + [e\text{-Intelligence} - 1]^2 + [e\text{-Collab.} - 0]^2 \right]^{1/2}$$

$$\text{Alignment}_{\text{Prospector}} = 1 - \left[[e\text{-Communic.} - 1]^2 + [e\text{-Commerce} - 1]^2 + [e\text{-Intelligence} - 1]^2 + [e\text{-Collab.} - 1]^2 \right]^{1/2}$$

where e-Communication, e-Commerce, e- Intelligence and e-Collaboration respectively take on a value of 1 or 0 depending if the particular e-business capability is possessed or not, and noting that the deviation score is subtracted from 1 in order to obtained a measure of “alignment” rather than “misalignment”.

4. Results

As shown in Figure 2, all of the sampled manufacturing SMEs use Internet-based technologies to develop e-communication internally and/or with their present and potential customers. A good proportion of firms (77 %) have also developed e-intelligence activities, using the Web to scan the commercial environment and/or prospect for new markets. However, much less SMEs (35 %) have developed e-business applications to sell their products and services. Even less practice

e-collaboration (30 %) by using the Internet to interact in R&D with their business partners in order to develop new products and services.

----- Figure 2: E-business capabilities of manufacturing SMEs (n=107) -----

As to their business strategy, 51 firms were classified as Prospectors (47.7 %), 35 as Analyzers (32.7 %), 21 as Defenders (19.6 %), and none as Reactors (0 %). The greater proportion of Prospectors may be due to the sample being composed of firms that have voluntarily undertaken a benchmarking exercise for a second consecutive year. Analysis of variance results presented in Table 2 also indicate that these three groups do not differ with respect to their e-business capabilities, that is, in terms of their developing e-communication, e- intelligence, e-commerce and e-collaboration. There thus appears to be no direct link between the SME's strategic orientation and its e-business capabilities, in conformity with the contingency approach underlying the research model.

----- Table 2: E-business capabilities by type of business strategy -----

One may recall at this point that a “universalistic” or “best practices” argument posits that the most-recognised strategic capabilities would have a positive effect whenever they are applied (Delery and Doty, 1996; Ketokivi and Schroeder, 2004). Thus, simply applying one or more capability would directly and positively influence organisational performance. Whereas the contingency argument suggests that IT capabilities are effective to the extent that they are “aligned” with the business strategy (Bergeron, Raymond and Rivard, 2004). In the present study, this last argument implies that it is neither the business strategy nor the e-business capabilities as such that affect performance but rather their alignment, and thus there is no “one best way” in matters of e-business.

Moreover, as indicated in Table 3 and conforming to Miles and Snow's (1978) initial assertion, none of the three strategic types is associated as such to better performances, neither to a particular environmental or organizational context. Indeed, for strategic management, the basic postulate of contingency theory is that no strategy is universally superior, whatever the environmental or organisational context (Venkatraman, 1989b). Thus, the absence of a direct link

between strategic orientation and performance is again in conformity with the contingency argument that underlies the research model.

----- Table 3: Context and performance variables by type of business strategy -----

Further evidence with regard to the contingency versus the universalistic or “best practice” argument is presented in Table 4, wherein the direct link between e-business capabilities and organizational performance is estimated by zero-order and partial correlation coefficients. When the environmental and organizational contexts are taken into account, it is essentially only in terms of productivity that e-business is shown to positively impact the sampled SMEs. More specifically, firms who use the Internet for e-commerce, for e-intelligence, and especially for e-collaboration purposes are more productive. E-commerce is also associated, but less significantly, with greater profitability.

----- Table 4: Correlation of e-business capabilities with performance -----

From a “best practice” perspective, e-business capabilities have become necessary to the extent that they enable manufacturing SMEs to be more productive by increasing the “reach” and the “richness” of their business processes (Sambamurthy, Bharadway and Grover, 2003). For e-commerce, the significant effect upon productivity, and eventually upon profitability, is realised through Web-enabled processes that integrate the firm with its customers, suppliers and other business partners for purposes of supply chain management and customer relationship management. For e-intelligence, it is the greater reach and richness of the market, technological and competitive intelligence captured and shared throughout the organisation that translates into improved productivity. Whereas the SME becomes more productive through e-collaboration by its ability to leverage the resources and competencies of customers, suppliers and other business partners within IT-enabled by inter-firm processes such as joint product research and development. However, greater leverage from e-business capabilities, while it may lead to improved productivity, does not necessarily lead to increased growth and profitability. Thus, in light of the study’s premise and objectives, one expects that the strategic alignment of e-business, through the contingency argument, to be a better predictor of business performance than e-business capabilities alone, through the universalistic argument.

The results of testing the research hypotheses are presented in table 5, that is, the correlation between strategic alignment, as measured by the gap between the firm's actual and ideal e-business profiles, and the three dimensions of organizational performance, namely the firm's growth, productivity and profitability. Zero-order correlations are first presented, followed by partial correlations, i.e. by controlling for the potential effects of the size and age of the firm, the technological intensity of the industry in which it operates and the power of its customers. Correlations are calculated for the sample as a whole (*H1*) as well as for each type of business strategy, that is, for Defenders (*H2*), Analyzers (*H3*) and Prospectors (*H4*).

----- Table 5: Correlation of e-business alignment with performance -----

These results partially confirm the basic hypothesis of this research (*H1*) in that greater alignment of e-business capabilities with the SME's business strategy is associated to an improved organizational performance. This relationship is observed to be significant for productivity ($r = 0.20$) and profitability ($r = 0.18$) but not for growth. The three other hypotheses are also partially confirmed. For SMEs whose strategic orientation is of the Defender type (*H2*), greater alignment of their e-business activities is associated to stronger growth ($r = 0.52$) and greater profitability ($r = 0.45$) but not to greater productivity. For Analyzer firms (*H3*), this alignment is also associated to growth ($r = 0.40$) and profitability ($r = 0.44$). Whereas for SMEs whose strategic orientation is of the Prospector type, alignment is associated only to productivity ($r = 0.33$). One may recall here that the conceptualisation of "alignment" is in terms of the gap between the firm's actual profile of e-business activities and its ideal profile for such activities, as determined by its type of business strategy.

When comparing these last results to the previous ones relating to the universalistic argument (Table 4), that is, when comparing the strength and direction of the correlation coefficients, it is quite evident that a greater proportion in the variance in performance is explained in general through the contingency argument, and in particular for growth and profitability in the case of Defenders and Analyzers, and for productivity in the case of Prospectors.

From complementary resource-based and competitive strategy perspectives (Rivard, Raymond and Verreault, 2006), the different impacts of e-business alignment on different dimensions of performance is also seen to compensate for the potential weaknesses of manufacturing SMEs with regard to their strategic orientation, if one recalls that Defenders tend to develop inward-oriented capabilities that are less apt to impact growth, whereas Prospectors tend to develop outward-oriented capabilities that are less apt to impact productivity. Indeed, returning to Table 5, e-business alignment is associated to increased sales growth for Defenders whereas these firms rather aim to be more productive, to increased productivity for Prospectors whereas these SMEs rather aim for growth in terms of market share, new product and services and increased sales.

It is possible that e-business contributes to the Defenders' performance in terms of productivity if it is assumed that Defenders are already productive before the implementation of e-business applications. In that case, the contribution of e-business is noticeable particularly in terms of sales growth and profitability, two indicators of performance. The sales of their standardized products would gain from being accessible by a larger customer base through the Internet.

For the Prospectors, e-business does not directly contribute to sales growth possibly because these firms' customers are generally large manufacturing firms or prime contractors, with whom long term business relationships have been established and where Internet accessibility is not a critical issue in delivering new services or products to these customers (Raymond and Blili, 2001). However, it is understandable that Prospectors are more productive since e-collaboration provides significant benefits in terms of the duration, cost and effectiveness of collaborative R&D and product design projects. As for the Analyzers who occupy the strategic middle ground between Defenders and Prospectors, they benefit from e-business alignment in about the same way as Defenders but in addition to growth and profitability, they also show a sizable positive (but not significant) relationship between alignment and productivity.

Overall, the Analyzers seem to draw the most diversified benefits from their development and alignment of e-business. E-business alignment is associated to an increased sales volume and a better return on assets for Analyzers, in conformity with these firms' aim for a dynamic equilibrium between growth and profitability through selective exploitation of product/market

opportunities and realisation of cost economies. In this sense, e-business alignment creates the most value for Analyzers because their strategic choices require the most flexibility (Beach *et al.*, 2000), and it is this flexibility that is enhanced by developing e-business capabilities.

5. Discussion

A number of contributions and implications of this research can be identified. This is one of the first studies to have used a rigorous conceptualisation and measure of alignment to confirm the theoretical validity and empirical usefulness of this notion and of the strategic contingency approach for research on e-business, and to compare this approach with the universalistic approach founded upon “best practices”.

Without the notion of strategic alignment, no direct link between the business strategy and the type of e-business applications can be demonstrated. Here, it is the combination of the e-business application types that makes the difference. This combination of applications, that is, the SME’s “profile” of e-business capabilities, is critical to its organisational performance. A Defender firm should thus aim for e-communication and e-commerce. An Analyzer SME should target e-communication, e-commerce and e-intelligence. A Prospector firm should aim for e-communication, e-commerce, e-intelligence and e-collaboration. One should note that for Defenders in particular, the e-business applications actually implemented do not conform at all to their ideal profile. Indeed, these SMEs favour e-intelligence more than Analyzers or Prospectors, whereas it is e-commerce that should contribute more to the Defenders’ performance. In other words, these SMEs invest in e-intelligence to no avail, whereas they would be better advised to invest in e-commerce applications.

This research also shakes the notion of the “tried-and-true” in matters of e-business, often associated to the experience of practitioners. A purely descriptive approach would have indeed shown the most prevalent forms of e-business in manufacturing SMEs to be e-communication, followed by e-intelligence, e-commerce, and finally e-collaboration. Consequently, one could have prescribed to these firms the implementation of e-business applications in that order, that is, to “follow the leaders”, which would have been a first error. Such an approach would also have demonstrated that, apart from e-communication, e-intelligence is the most prevalent form of e-

business for SMEs of the Defender type. Hence prescribing the implementation of e-intelligence in these organizations to the detriment of e-commerce would have been a second error. The strategic alignment perspective thus clarifies the relationship between the various types of e-business and the performance of manufacturing SMEs and, at the same time, brings to light results that contradict the initial descriptive findings.

These results also allow us to emphasise the nature rather than the investment value of the SMEs' IT investment, given that certain forms of e-business would be more appropriate for certain firms, depending upon their strategic orientation. For instance, SMEs that would have the most interest in implementing a Web site of a transactional nature (e-commerce) would be of the Defender type, given the positive impact this would have on their financial performance, whereas Prospectors would benefit more from a Web-based business intelligence system (e-intelligence) with regard to their productivity. Imitation would thus be a valid e-business strategy only to the extent that the firm shares the same type of business strategy with the competitor or competitors it is trying to imitate.

Having examined the rather complex relationship between the strategic alignment of e-business and organisational performance, we have confirmed the existence of certain associations, a number of which depend upon the business strategy. For instance, a positive association between alignment and growth was observed for Defenders and Analyzers but not for Prospectors. In a similar way, a positive association between alignment and productivity was found only for Prospectors. This implies that strategic alignment cannot in turn be prescribed in universal fashion. However, these results are taken on added validity and transferability in that they take into account the contextual diversity of the SMEs' e-business activities, be it in terms of the size and age of these firms that conditions their resources and competencies, the power of customers that is imposed upon their business processes, and the institutional forces present in the industry in which they operate.

There is another relevant implication with regard to the assimilation of e-business in manufacturing SMEs. For owner-managers of such firms that require greater manufacturing flexibility, increased systems integration, products and services of better quality, and higher

levels of product and process innovation, the results of this study allow us to prone an examination of their firm's level of e-business assimilation, this being done in conjunction with their strategic intent. Identifying the extent to which various forms of e-business have been developed and assimilated is essential to determine if these are aligned with the firm's strategic objectives and competitive environment. For example, this would help in answering a question that is now posed to a number of manufacturing SMEs under pressure from competition that is now global and from large prime contractors in particular, that is, if they must participate in e-markets and in what form (Brown and Lockett, 2004).

6. Limitations

This study has certain limitations that must be mentioned. The enterprises sampled may not be fully representative of Canadian manufacturing SMEs with regard to size and industry. Given that these are firms that have chosen to undertake an organisational diagnostic exercise, there might be a sample bias in that the sampled SMEs may differ from the general population in terms of their strategic orientation, their e-business profile and their performance (Cassell, Nadin and Gray, 2001). Other than the nature of the sample, a limitation associated to the survey method lies in the use of perceptual measures that demand prudence in generalising results. Relying on the perceptions of one key informant, the CEO, for the self-typing of the firm's IT-strategy alignment may also imply cognitive biases; however, previous empirical studies have demonstrated this type of measurement to be valid. The cross-sectional rather than longitudinal nature of the study implies that causality cannot be inferred, and that the results do not necessarily reflect the nature of alignment as a process as well as the changes that can occur in the SMEs' strategy, given their level of development or their competitive environment. Finally, while it has been used in this research to describe the strategic behaviour of SMEs with clarity and parsimony, Miles and Snow's typology inevitably simplifies reality to the extent that firm may adopt hybrid strategies that combine certain characteristics of Defenders, Analyzers and Prospectors (DeSarbo *et al.*, 2005).

7. Conclusion

It is recognised that SMEs must be flexible and readily adaptable to change, be it competitive, strategic, operational or technological in nature. In a business environment that has become more complex, a number of these enterprises have already possess e-business capabilities in the form of e-intelligence, e-commerce and e-collaboration in order to improve their competitive position. In the continuation of the present research results, one should not however propose such practices to SMEs as being “the best”, to be adopted by all firms whatever their strategic orientation, but rather in a contingency perspective. As demonstrated, investments in e-business alone are not sufficient to improve business performance, especially if they are not coherent with the environment and strategic objectives of SMEs. To this end, these enterprises must improve their technology management capability, and thus they must receive added support from researchers and knowledge transfer agents. For purposes of comparison and extension of these findings, further research on the strategic alignment of e-business in SMEs must be pursued, using other strategic typologies than that of Miles and Snow, such as Porter’s (1980) generic competitive strategies, and examining other manifestations of e-business such as the business models that result from developing e-business capabilities.

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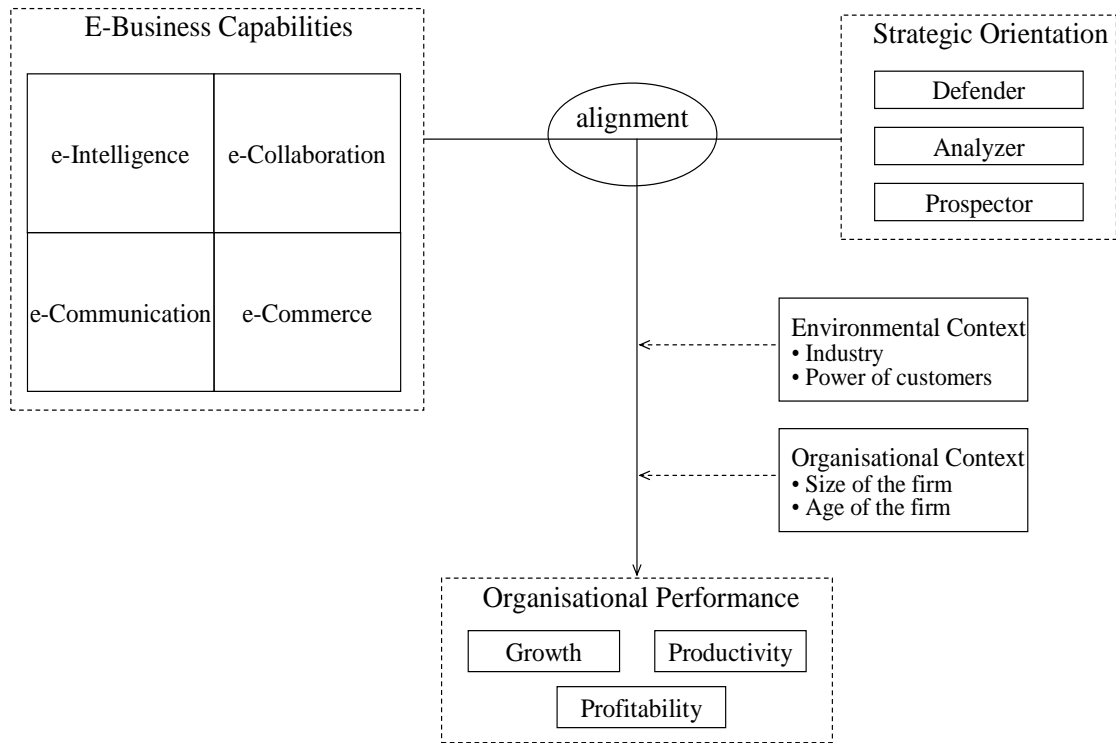
Figure 1: Research model on the strategic alignment of e-business in SMEs

Table 1: Ideal e-business profile for each type of business strategy

Business Strategy	Defender	Analyzer	Prospector
e-Business Capabilities			
e-Communication	yes	yes	yes
e-Commerce	yes	yes	yes
e-Intelligence	no	yes	yes
e-Collaboration	no	no	yes

Figure 2: E-business capabilities of manufacturing SMEs (n=107)

	<p>e-Intelligence (n = 82)</p> <p>Develop business intelligence (43%)</p> <p>Prospect for new customers overseas (55%)</p> <p>Prospect for new customers nationally (65% of SMEs)</p>	<p>e-Collaboration (n = 32)</p> <p>Interact with business partners in R&D to develop new products and services (30% of SMEs)</p>	
strategic			
Managerial decision			
	<p>e-Communication (n = 107)</p> <p>Interact with customers to develop new products and services (58%)</p> <p>Develop internal communications (67%)</p> <p>Promote products and services (75%)</p> <p>Promote the firm (89% of SMEs)</p>	<p>e-Commerce (n = 37)</p> <p>Sell products and services (35% of SMEs)</p>	
operational			
	informational	Business process	relational

Table 2: E-business capabilities by type of business strategy

E-business capabilities ^a	All SMEs mean. (n = 107)	<i>Defenders</i> mean (n = 21)	<i>Analyzers</i> mean (n = 35)	<i>Prospectors</i> mean (n = 51)	ANOVA F (p)	ANOVA F (p) with covariates ^b
e-Communication	1.00	1.00	1.00	1.00	0.0 (n.s.)	0.0 (n.s.)
e-Commerce	0.35	0.33	0.31	0.37	0.2 (n.s.)	1.1 (n.s.)
e-Intelligence	0.77	0.90	0.74	0.73	1.4 (n.s.)	0.0 (n.s.)
e-Collaboration	0.30	0.33	0.31	0.27	0.1 (n.s.)	0.1 (n.s.)

n.s.: non significant ($p > 0.1$)

^afunction for which the Internet is used (dichotomous variable, 1:yes, 0: no)

^bSize and Age of the firm, Industry, and Power of customers

Table 3: Context and performance variables by type of business strategy

Context and performance variables	All SMEs mean (n = 107)	<i>Defenders</i> mean (n = 21)	<i>Analyzers</i> mean (n = 35)	<i>Prospectors</i> mean (n = 51)	ANOVA F (p)	ANOVA F (p) with covariates ^h
Size of the firm ^a	79	85	71	82	0.5 (n.s.)	-
Age of the firm ^b	28	29	32	24	2.9 (n.s.)	-
Industry ^c						
low-tech sector	0.25	0.14	0.37	0.21	2.2 (n.s.)	-
medium to low-tech	0.62	0.76	0.51	0.63	1.7 (n.s.)	-
medium to high-tech	0.13	0.10	0.12	0.16	0.3 (n.s.)	-
Power of customers ^d	0.44	0.49	0.43	0.42	0.8 (n.s.)	-
Growth ^e	0.155	0.148	0.103	0.193	1.5 (n.s.)	0.7 (n.s.)
Productivity ^f	0.011	0.008	0.010	0.012	0.7 (n.s.)	0.4 (n.s.)
Profitability ^g	0.125	0.110	0.105	0.145	2.3 (n.s.)	1.4 (n.s.)

n.s.: non significant ($p > 0.05$)

^anumber of employees

^bnumber of years since creation

^ctechnological intensity associated to the industrial sector under the OECD's (2005) classification

^dpercentage of sales to the 3 main customers

^eaverage growth in net sales over the last 3 years

^fgross margin per employee = gross profit / net sales / number of production employees

^greturn on assets = earnings before income taxes / total assets

^hSize and Age of the firm, Industry, and Power of customers

Table 4: Correlation of e-business capabilities with performance

correlation (n = 107)	e-Communication		e-Commerce		e-Intelligence		e-Collaboration	
	0-order	partial ^a	0-order	partial	0-order	partial	0-order	partial
Growth	- ^b	-	0.05	0.04	-0.09	-0.14*	-0.00	-0.00
Productivity	-	-	0.16**	0.19**	-0.01	0.14*	0.22**	0.27***
Profitability	-	-	0.16**	0.14*	-0.07	-0.07	-0.16**	-0.13

*: p < 0.1 **: p < 0.05 ***: p < 0.01

^awith control of Size and Age of the firm, Industry, and Power of customers

^bvariable is constant (= 1 in all cases)

Table 5: Correlation of e-business alignment with performance

Correlation	alignment All SMEs (n = 107)		alignment <i>Defenders</i> (n = 21)		alignment <i>Analyzers</i> (n = 35)		alignment <i>Prospectors</i> (n = 51)	
	0-order	partial ^a	0-order	partial	0-order	partial	0-order	partial
Growth	0.06	0.10	0.37**	0.52**	0.16	0.40**	-0.01	-0.05
Productivity	0.13*	0.20**	0.08	0.03	0.04	0.22	0.19*	0.33**
Profitability	0.14*	0.18*	0.35*	0.45*	0.18	0.44***	0.14	0.13

*: p < 0.1 **: p < 0.05 ***: p < 0.01

^awith control of Size and Age of the firm, Industry, and Power of customers