

December 2004

Strategic alignment: a performance tool (An empirical study of SMEs)

Nihel Jouirou

Paris IX Dauphine University

Michel Kalika

Paris IX Dauphine University, CREPA

Follow this and additional works at: <http://aisel.aisnet.org/amcis2004>

Recommended Citation

Jouirou, Nihel and Kalika, Michel, "Strategic alignment: a performance tool (An empirical study of SMEs)" (2004). *AMCIS 2004 Proceedings*. 467.

<http://aisel.aisnet.org/amcis2004/467>

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 2004 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

Strategic alignment: a performance tool

(An empirical study of SMEs)

Nihel Jouirou

Paris IX Dauphine University, CREPA
nihelj@yahoo.fr

Kalika

Paris IX Dauphine University, CREPA
michel.kalika@dauphine.fr

ABSTRACT

The purpose of this research is to investigate whether the alignment of IT with the strategy (particularly the partnership strategy or cooperation practice) and organizational structure of an SME could have a decisive influence on its performance. We constructed a model and tested it empirically using data from 381 SMEs operating in different sectors. A multivariate perspective, modelled with structural equations, was used to test the alignment between strategy, structure and IT. The alignment is considered as a covariation of a set of theoretically related variables. The results indicate that the alignment of IT with corporate strategy and organizational structure could generate the best performance levels for an SME.

Keywords

IT, SME, strategic alignment, strategy, organizational structure, performance

INTRODUCTION

To solve the problem of measuring Information Technology (IT) productivity, different perspectives must be found to evaluate IT-based systems implementation (Strassman, 1997).

Strategic alignment's importance is well known. Papp (1995) indicates that the importance of this concept has been documented since the late 1980s (McLean and Soden, 1977; Mills, 1986; Parker and Benson, 1988; Brancheau and Wetherbe, 1987; Venkatraman, 1989; Dixon and John, 1991; Niederman, et. al., 1991; Earl, 1993; Henderson and Venkatraman, 1993) and continuous to be ranked one of the most important issues faced by business executives (Luftman, 1996; Croteau, Bergeron & Raymond, 2001; Nickerson & al., 2003, Kalika & Kefi, 2003, ...). Most of these investigations examine the impact of firm performance, given the firm's current alignment perspective.

Existing tools for performance analysis and instructions for their implementation have been primarily developed for large firms. Compared with large enterprises, small and medium-sized enterprises (SMEs) have fewer financial resources, less technical expertise and poorer management skills (Blili & Raymond, 1993) and have only started to use IT relatively recently.

The present research focuses particularly on SMEs and seeks to test if this type of enterprise could achieve best performance levels by aligning strategy, structure and IT.

The population consists of SMEs involved in a partnership. In a strategic alignment context, the conceptual framework of the research is based on studying the relationship between four variables: corporate strategy, IT strategy, organizational structure and co-alignment.

In this paper, we first give a brief review of literature on strategic alignment and information systems success. We then present our research proposition and exploratory hypotheses. Finally, we discuss the results of a study of 381 SMEs.

THEORETICAL CONTEXT

Many researchers recognize that Information Systems (IS) success is a difficult concept to define (Weill & Baroudi, 1990). Delone & McLean (1993), through a comprehensive literature review of IT success measures, concluded that "in searching for an IS success measure, rather than finding none, there are nearly as many measures as there are studies".

Henderson & Venkatraman (1993) argued that the "inability to realize value from IT investments is, in part, due to a lack of alignment between the business and IT strategies of organizations". They have developed a conceptual model, the Strategic Alignment Model (SAM), to address the issue of exploiting IT capabilities in their competitive role and for the strategic management of IT. Luftman (1996) presented the aspects of this model and explained how to develop a synchronous set of strategies and policies within a company.

In this research, we proposed a model and try to show the importance of the alignment of the IT strategy with the internal environment of the firm (strategy orientation and organizational structure). So, our model consists of four constructs: strategy orientation, IT strategy, organizational structure and organizational performance.

Strategy orientation

Atkinson (1990) suggested that the strategic orientation of a firm is crucial to its performance. Thus, if a firm decided to cooperate (or enter into partnership) with other firms, it could improve its organizational performance by reducing costs, improving production etc.

Strategy is a comprehensive master plan stating how the organization will achieve its mission and objectives (Wheelen & Hunger, 1998). It maximises competitive advantage and minimises competitive disadvantage.

Based on past research, Henderson and Venkatraman (1990) classify strategies into three broad categories:

- Corporate strategy (concern interrelationship among businesses)
- Business strategy (focusing on deploying a strategy at a unit or product level that maximises the organization unit or product's comparative advantage to best compete in the marketplace)
- Functional strategy (reflecting efficient allocation of resources allocated to the particular firms)

Organizational structure

Ettlie, Bridges and O'Keefe (1984) indicated that a firm's structure is regarded as fundamental to its strategic technological choices. For that, firms were recently engaged on a revision process of their structure and their organization.

Various researchers have proposed a contingency approach in which a firm's performance depends on the degree of coherence between its structure and its environment (Raymond and al., 1998). Research has shown that integration is necessary to maintain the coherence of a firm's workings.

IT strategy

Venkatraman (1989), in his research on IT impact, suggested that IT could build a development highway for new profitgenerating activities. He argued that IT has an important organizational and strategic dimension.

Cash and Konsynski (1985), Copelnd and McKenney (1988) and Venkatraman and Kambil (1990) have explained that extending beyond the internal, efficiency focus, the capabilities now exit for organizations to deploy new IT applications that leverage information and technology attributes to obtain differential sources of competitive advantages in the marketplace.

Recent research shows that IT has tended to transform traditional firms into numeric digital enterprises (Isaac, 2002). They enable enterprises to establish electronic relations with their clients and suppliers through Exchange Electronic Data technology (EED)), to share markets and electronic platforms with their competitors (notably through marketplaces) and to easily reach new global markets.

The internet and the interconnection of different partners' production systems have increasingly facilitated cooperation (Isaac, 2002). EED technology, for example, amplifies interactions between two partners by facilitating social exchanges and the coordination of resources and modes of adaptation and cooperation (Baile, 2003).

Organizational performance

Robinson (1983) argued that performance could be measured in two ways: objectively or subjectively. Objective measurements are generally based on financial data (such as financial results). However, subjective measurements are based on managers' evaluations relative to their perception of IT impacts. According to Miller (1987), subjective measurements are

better than objective measurements since accounting information is not readily available and not usually reliable since they could be manipulated by owners for various reasons.

In our research we used a tool developed by Venkatraman (1989), based on the subjective approach, to evaluate organizational performance. Thus, we evaluated performance according to four criteria: improved production, cost reduction, the ability to innovate and customer satisfaction.

Strategic alignment

Various terms and definitions have been used in the literature to describe the concept of business strategy and IT strategy alignment: “strategic alignment” (Henderson and Venkaraman, 1993; Luftman, 1996; Chan and Huff, 1993, Papp, 1995), “linkage” (Reich and Benbasat, 1996) and “harmony” (Woolfe and Cash, 1992). For, Woolfe and Cash (1992), “strategic alignment” occurs when a company has harmonised its overall strategy and its IT systems. Chan and Huff (1993) explain that organizations typically achieve “strategic alignment” by passing through three levels: awareness, integration and alignment. The awareness level indicates that the firm has reached a level of awareness in recognising and acting upon the importance of having Information System (IS) more closely connected with the business. The second level is concerned with integrating operational business and IS plans and activities. The final level (strategic alignment level) concern integrating IS with the organization’s fundamental strategies and core competencies.

Papp (1995) defines ‘strategic alignment’ as the appropriate use of IT in the integration and development of business strategies and corporate goals.

Strategic alignment model of the research

The figure below shows the strategic alignment model we tested:

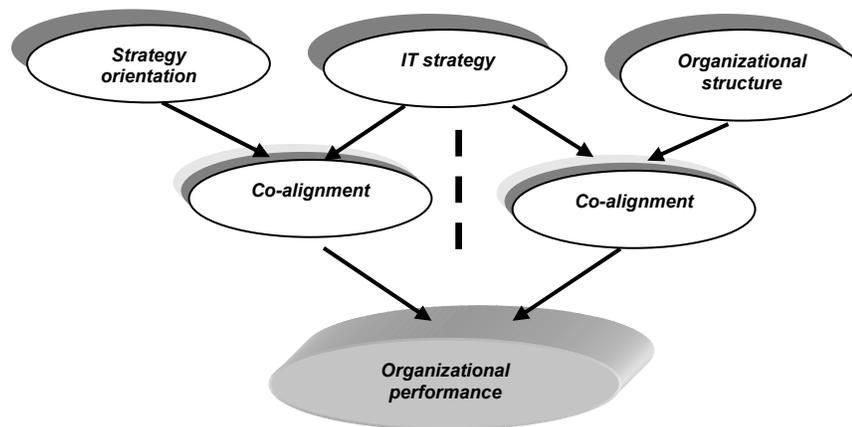


Figure 1. Strategic alignment model

This figure shows that, if a firm wants to generate best performance levels, it should align its IT strategy with its strategy and its organizational structure. In others words, firms can achieve best performance levels by aligning IT strategy with corporate strategy and structure.

RESEARCH PROPOSITION AND EXPLORATORY HYPOTHESES

In this study, we investigate the following question:

What is the impact on SMEs' performance of the alignment of IT with their corporate strategy and organizational structure?

To answer the question we first constructed two sub-hypotheses:

H1: If IT strategy is aligned with corporate strategy (partnership), performance improves.

H2: If IT strategy is aligned with the firm's organizational structure, performance improves.

We then have grouped these two hypotheses in a global hypothesis:

GH: If IT strategy is aligned with the firm's corporate strategy and organizational structure, performance improves.

The hypotheses are summarized in the figure below:

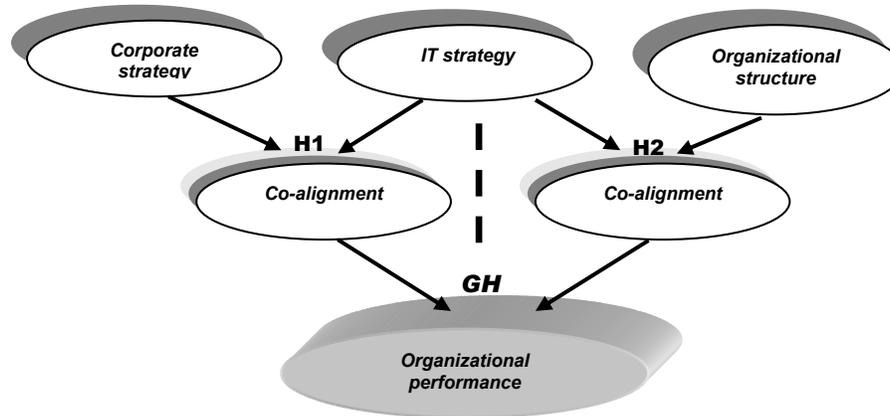


Figure 2. Summary of hypotheses

METHODOLOGY

To test the hypotheses, we first took a sample of 381 SMEs from the Dauphine-Cegos Laboratory¹ database. The SMEs have between 50 and 500 employees and operate in different sectors (manufacturing, industry, communication, etc.)

Our model is constructed from four constructs, shown above: corporate strategy, organizational structure, IT strategy and performance.

To measure these constructs, we have operated them by different items. These items were collected every year using a questionnaire which was established by Dauphine-Cegos Laboratory and was distributed to executive managers to evaluate IT impact on firms management. Moreover, these items were measured by Likert scales using 5 point scales (see appendix).

Then, a multivariate perspective was used to test the alignment between strategy, structure and IT. Strategic alignment is considered as a covariation, or an internal coherence, of a set of theoretically related variables (Venkatraman, 1989).

We analyzed the data in two stages. First, we undertook a descriptive analysis using SPSS software which enabled us to describe our sample and analyze measurement scales. This factor analysis is used to validate the scales and confirm the factors researched. Second, we used AMOS 4.0 structural equation modelling software to test our research model. This allowed us to simultaneously evaluate our propositions and our measurements for the model in question.

ANALYSIS AND DISCUSSION OF RESULTS

The principal aim of factor analysis consists on structuring items and summarizing them in a small number of variables named factors (Evrard et al., 2000). This method allows us to select from a set of initial items those which predominate in describing phenomena. Six factors have been obtained. The first one allows to operationalise our first construct (strategy orientation) and corresponds to the practice collaboration (“PRAT”), characterizing the partnership between firms. Then, the three others identified factors operationalise IT strategy construct. They correspond respectively to integration degree (“INTE”), in terms of consolidation production, purchasing, quality, etc., to IT infrastructure (“INFR”), and communication (“COM”), in terms of facilitating direct communication between members.

¹ www.observatoireemangement.com

The fifth one corresponds to coordination (“CORD”) and allows to operationalise the third construct (organizational structure). The latest and sixth factor (“PERF”) enables the measure of organizational performance construct. It regroups four items corresponding to individual productivity improvement, cost control improvement, company’s innovation capacity increasing and customers’ satisfaction. The following chart summarizes the method:

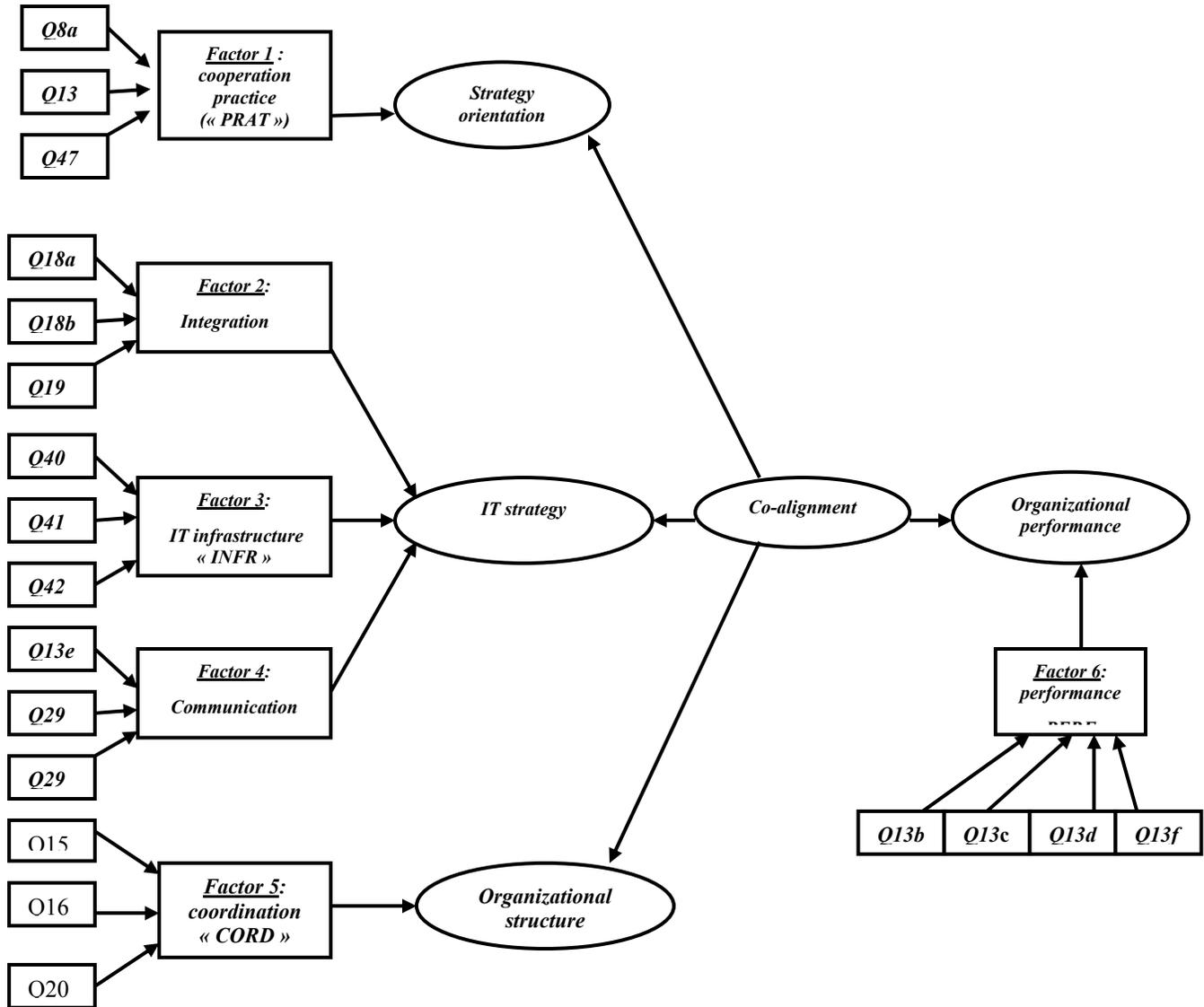


Figure 2. Items and factors summary

We used the maximum likelihood method to assess our structural model. The convergent reliability and validity of the alignment were evaluated by examining the adjustment level of the model and the causality coefficient linking alignment and performance constructs.

For the absolute fit measure, chi-square test results are 39.766 for 9 degrees of freedom. The GFI has a value of 0.970. The Root Mean square Residual (RMR) is 0.066, which is within the acceptable range of 0.08 or less. Another measure that attempts to correct the tendency of the chi-square statistic with a sufficiently large model is the Root Mean Square Error of Approximation (RMSEA), where values ranging from 0.08 to 0.12 are deemed acceptable. The proposed model’s RMSEA is 0.095 and falls within that range.

The parsimonious measure of AGFI is 0.931. The second parsimonious measure is the named chi-square ($\chi^2/d.f$), which has a value of 4.418. This falls within the recommended level of 5.0 (Jöreskog & Sörbom, 1993).

Having assessed the structural model, the estimated coefficients can now be examined on both practical and theoretical grounds. As a measure of the entire structural equation, an overall coefficient of determination (R^2) is calculated. It provides a relative measure of fit for each structural equation.

Standardized estimation coefficients are another means of evaluation. The coefficients closely approximate effect sizes shown by beta weights in regression. Coefficients near zero have little, if any, substantive effect, whereas an increase in values corresponds to increased importance in the causal relationships. These results are summarized in the following table:

Standardized estimation coefficients	Estimator
GSTIC <-- ALIG	0.477
STRA <-- ALIG	0.560
STRU <-- ALIG	0.569
PER <-- ALIG	0.597
INFRASTR <-- GSTIC	0.751
COMMUNIC <-- GSTIC	0.441
INTEGRAT <-- GSTIC	0.253
PRATCOLL <-- STRA	0.770
COORDINA <-- STRU	0.772
PERFORMA <-- PER	0.780

The structural equation fit of the endogenous constructs, the co-alignment, shows that strategy orientation (ie, partnership strategy) accounted for 31% of its variance, IT strategy for 23% and organizational structure for 32%. These results demonstrate the importance of the fit between these three constructs.

The results of the structural equation method are shown in the following figure:

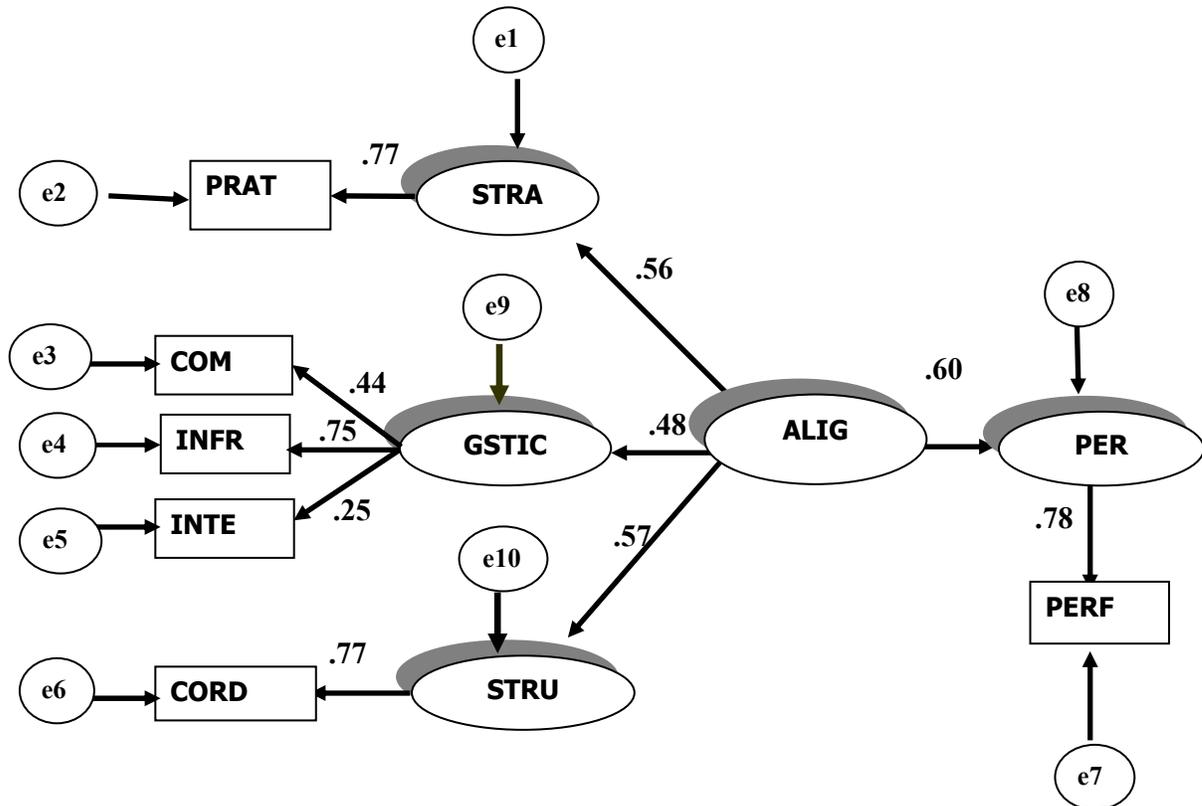


Figure 3. Final fitted model

The results suggest that there is a significant relationship between strategic alignment and performance ($\gamma=0.60$, $p<0.001$). This result confirms our principal hypothesis (GH) which suggests that if IT strategy is aligned with the firm's strategy and organizational structure, performance improves.

The findings for the two sub-hypotheses ($\gamma_1=0.56$ and $\gamma_2=0.48$ and $\gamma_3=0.57$) indicate that IT strategy could be aligned with the firm's corporate strategy and organizational structure to generate best performance levels.

Most indices suggested that the proposed model is acceptable. The Goodness of Fit and Chi-square measures for the overall model are adequate ($\chi^2 = 39.766$, $GFI = 0.970$). Evidence of internal consistency is provided by the composite reliabilities and variance extracted measures. The R^2 of the endogenous constructs also exhibited statistical significance for the structural model.

CONCLUSION

The results of the research indicate that aligning IT strategy with an SME's partnership strategy and organizational structure generates best performance levels. To put it another way, the results suggest that there is a direct positive link between strategic alignment and organizational performance. The data from 381 SME support our propositions.

The results also suggest that if an SME embarking on a cooperation practice aims to generate better performance, it should align its adopted technology with its internal organization (corporate strategy and organizational structure). Thus, to achieve a successful partnership strategy SMEs need to analyze the organizational impact of adopting technologies. More importantly, firms need to understand how to align IT strategy with their corporate strategy orientation and organizational structure. Thus, the positive relationship between alignment and performance indicates how important it is for firms to get the right fit.

On managerial field, this research contributes to encourage managers of SMEs to more considerate, when adopting a new technology, the importance of the alignment to generate a better organizational performance.

This study's results show, like other previous researches, the importance of the strategic alignment concept.

The study has two main limitations. First, the data used in the study were taken from the Dauphine-Cegos Laboratory database. Data reliability was not guaranteed since the data derived from managers' opinions. Second, other items, such as the role of managers, could be added to explain constructs.

There are several avenues for future research. For example, research could focus on SMEs in only one sector, such as manufacturing for example. So, a new questionnaire could be constructed to better evaluate the constructs of the structural model used in the research.

REFERENCES

1. Atkinson, R.A. (1990) Strategic planning: the motivations for strategic planning, *Journal of Information Systems Management* 53-56
2. Baile, S. (1995) Bénéfices et avantage comparatifs des EDI pour les PME, *Revue Internationale des PME*, 8, 2, 8-47
3. Baile, S. (2003) Business Partnership alignment to electronic partnership with EDI: an empirical study of success with structural linear equation model, *5è colloque de l'AIM*, Montpellier, Novembre
4. Blili, S. and Raymond, L. (1993) Information Technology: threats and opportunities for Small and Medium sized Enterprises, *International Journal of Information Management*, 13, 6, 3-12
5. Brancheau, J., & Wetherbe, J. (1987) Issues In Information Systems Management, *MIS Quarterly*, 11(1), 23-45.
6. Cash J.J. & Konsynski B. (1985) IS redraws competitive boundaries, *Harvard Business Review*, 63 (2)
7. Chan Y. & Huff S. (1993) Strategic information systems alignment, *Business Quarterly*, 58 (1)
8. Chan Y., Huff S., Barclay D.W., and Copeland D.G. (1997) Business strategic orientation, information system strategic information orientation, and strategic alignment, *Information Systems Research*, 8, 2, 125-150
9. C. Nickerson R., Jamie, Eng and Lisa C. Ho, (2003) An exploratory study of strategic alignment and global information system implementation success in fortune 500 companies, *AMCIS*, August
10. Croteau A.M., Bergeron F., Raymond L. (2001) *Business strategy and technological deployment: fit and performance*, *Information System and Management*, 6, 4
11. Copeland D.G. & McKenney J.L. (1988) Airline reservations systems: lessons from history, *MIS Quarterly*, 12
12. Delone, W.H. and McLean, E.R. (1992) Information system success: The quest for the dependent variable, *Information System Research*, 3, 1, 60-95
13. Dixon, P., & John, D. (1989) Technology Issues Facing Corporate Management in the 1990s, *MIS Quarterly*, 13(3), 247-55.

14. Drazin R., and Van de Ven A. H. (1985) Alternative forms of fit in contingency theory, *Administrative Science Quarterly*, 30, 514-539.
15. Earl, Michael J (1993) Experience in Strategic Information Systems Planning, *MIS Quarterly*, 17(1), 1-24
16. Ettlie J. E., Bridges W. P. and O'Keefe R. D. (1984) Organization Strategy and structural Differences for Radical versus Incremental Innovation, *Management Science*, 30, 682-695
17. Evrard, Y., Pras B. and Roux E. (2000) Market – Etudes et recherches en marketing, *Dunod*, Liège, Belgique
18. Henderson J., & Venkatraman N. (1990) Strategic Alignment: A model For Organizational Transformation Via Information Technology, *Working Paper 3223-90, Sloan School of Management*, Massachusetts Institute of Technology.
19. Henderson J. C. and Venkatraman N. (1993) Strategic Alignment: A Model for Organizational Transforming via Information Technology, *Oxford University Press*, New York.
20. Henri I. (2002) L'entreprise numérique : enjeux et conséquences de nouveaux systèmes d'informations, *Revue française de gestion*, N°130, Juillet
21. Hitt, L.M, and Brynjolfsson, (1996) Productivity, Business Profitability, and Consumer Surplus: Three Different Measures of Information Technology Value, *MIS Quarterly*, 20, 2, 121-141
22. Jöreskog K.G. and Sörbom D., (1993) LISREL 7; a guide to the program and applications, *Chicago*, SPSS Inc
23. Kalika, M., Ledru, M., Isaac, H., Beyou, C., Josserand, E., (2003) Le e-management : quelles transformations pour l'entreprise ?, *Editions Liaisons*
24. Kefi, H. and Kalika, M. (2003) Choix stratégique de l'entreprise étendue et déploiement technologique : alignement et performance, *5^{ème} colloque de l'AIM*,
25. Luftman, J. (1996) Competing in the information age: strategic alignment in practice”, New York: Oxford University press
26. Luftman, J., Papp, R., & Brier, T. (1999) Enablers and Inhibitors of Business-IT Alignment, *Communications of the AIS*, Volume 1, Article 11, March, 1999
27. McLean, E., & Soden, J., (1977) Strategic Planning for MIS, *New York, John Wiley & Sons*
28. Mills, P., (1986) Managing Service Industries, *New York Ballinger*
29. Niederman, F., Brancheau, J., & Wetherbe, J. (1991) Information Systems Management Issues For the 1990s, *MIS Quarterly*, 15(4), 475-95
30. Papp, R. (1995) Determinants of Strategically Aligned Organizations: A Multi-industry, Multi-perspective Analysis, (Dissertation), *Stevens Institute of Technology*, Hoboken, New Jersey
31. Raymond, L., Bergeron, F., Leclerc, C. & Gladu, M. (1998) The contribution of information technology to the performance of the SMEs: Alignment of critical dimensions, *6th European conference on information systems*, Aix-en-Provence, France
32. Reich B.H & Benbasat I. (1996) Measuring the linkage between business and information technology objectives, *MIS Quarterly*, 20 (1)
33. Strassman P.A (1997) Computers have yet to make companies more productive, *Computersword* 6/21/97, vol.31, Issue 37
34. Venkatraman, N. (1989) The concept of fit in strategy research: toward verbal and statistical correspondence, *Academy of management review*, 9, 513-525.
35. Venkatraman N. & Kambil A. (1990) Strategies for electronic integration: lessons from electronic filing of tax returns. CISR Working Paper N°209
36. Weill, P., and Baroudi, J. (1990) An empirical investigation of the relationship between firm performance and system success, *Working paper N°15, University of Melbourne*, The Graduate School of Management
37. Weill, P., and Olson, M. H. (1989) An Assessment of the Contingency theory of Management Information Systems, *Journal of Management Information Systems*, 6, 1, pp. 59-86.

APPENDIX

Operationalising constructs (the questionnaire)

The "strategy orientation" construct

Three items have been identified to operationalise this construct:

Q_{8a}: "Your company's strategic growth is based on partnerships."

Q_{13a}: "ITs have enabled you to move from a confrontational relationship with your suppliers to a collaborative one."

Q₄₇: "You and your partners have embarked on cooperations that use information sharing tools."

The "IT strategy" construct

Nine items have been identified to operationalise this construct:

Q_{13e}: "ITs have increased your company's ability to react."

Q_{18a}: "The information system automatically consolidates sales data in order to constitute indicators for steering purposes."

Q_{18b}: "The information system automatically consolidates production, purchasing, quality and marketing data in order to constitute indicators for steering purposes."

Q₁₉: "The indicators are updated in real time (24h)."

Q₂₉: "Information technologies facilitate direct communication between the members of project groups."

Q₃₀: "The results of group work are directly accessible online in the information system."

Q₄₀: "Customers are billed automatically by computerised data exchanges (EDI, extranet)."

Q₄₁: "Suppliers pay their bills automatically by computerised data exchanges (EDI, extranet)."

Q₄₂: "Stocks (customers-suppliers) are automatically reconstituted via EDI."

The "organisational structure" construct

Three items have been identified to measure this construct:

Q₁₅: "Generally speaking, ITs have ensured better coordination between departments."

Q₁₆: "Information sharing has improved thanks to ITs."

Q₂₀: "Departmental decisions and strategic guidelines are systematically communicated in electronic form (mail, intranet)."

The "organisational performance" construct

Four items have been chosen to operationalise this construct:

Q_{13b}: "ITs have improved individual productivity in your company."

Q_{13c}: "ITs have improved cost control."

Q_{13d}: "ITs have increased your company's capacity for innovation."

Q_{13f}: "ITs mean that customers' expectations can be better addressed."