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To cite this version:
Louis Raymond, Josée St-Pierre. ENTREPRENEURIAL ANTECEDENTS AND PERFORMANCE OUTCOMES OF ORGANISATIONAL DEVELOPMENT IN MANUFACTURING SMEs. VIe Conférence internationale sur le management par la qualité et le développement organisationnel, QMOD2003, 2003, Paris, France. hal-01702541

HAL Id: hal-01702541
https://hal.archives-ouvertes.fr/hal-01702541
Submitted on 6 Feb 2018

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ENTREPRENEURIAL ANTECEDENTS AND PERFORMANCE OUTCOMES OF ORGANISATIONAL DEVELOPMENT IN MANUFACTURING SMEs

Louis Raymond
Josée St-Pierre
Institut de recherche sur les PME
Université du Québec à Trois-Rivières
C.P. 500
Trois-Rivières, Qc
Canada G9A 5H7
email : louis_raymond@uqtr.ca

Abstract

Now facing global competition and increasing demands from major customers and prime contractors, many manufacturing SMEs feel growing pressure to develop their organisation and become world-class enterprises. An empirical study of 201 Canadian manufacturing SMEs was designed to answer the following research questions: What is the relationship between levels of network development, market development and product development? What is the impact of the entrepreneur on the level of organisational development? And what is the impact of organisational development on enterprise performance?

Keywords: organisational development, SME, innovation, R&D, internationalisation, export, network, performance.

1. Introduction

Globalisation, the internationalisation of markets, the liberalisation of trade, deregulation, the knowledge economy, e-business, and new forms of organization, all of these interrelated phenomena pose new challenges to small and medium-sized enterprises (SMEs) (Raymond, 2000). Most often less endowed in human, financial, and technological resources than large enterprises, SMEs nonetheless have advantages in terms of flexibility, reaction time, and innovation capacity that make them central actors in the new economy.

In this complex business environment, SMEs must develop themselves in order to remain competitive and thus survive, grow, and prosper. Now facing global competition, many manufacturing SMEs in particular feel growing pressure from major customers and prime contractors to become “world-class” enterprises (Hendry, 1998). Such development can take place basically in three non-mutually exclusive ways. One way is for the small manufacturer to develop new markets for its products, that is to expand from a local or a regional market to a national or international market (Levratto, 2002). Another way is through product innovation, that is to create new products for present and prospective customers (Roper and Love, 2002). In the new knowledge-based economy however, a third way has become a pre- or co-requisite of the first two, that is the development of the firm’s networks or relational capital. For the manufacturing SME, this implies collaboration and partnerships with customers, suppliers, distributors, competitors and other organisations such as consulting firms and research centres (Gulati, 1998). These collaborations are essential to SMEs that do not dispose of all the resources necessary to effectively accomplish these developments. They can thus preserve their flexibility and share with others human, financial, and relational capital in order to reduce the risks associated with the new global business environment.

In entrepreneurial firms, fundamental choices in terms of organisational development are made by their owner-manager (Kotey and Meredith, 1997). It thus stands to reason that entrepreneurs’ knowledge and skills, as well as their strategic orientation with respect to new markets, new products, and new technologies will influence the organisation. In turn, this level should have an impact on the firm’s performance in terms of growth, productivity and profitability. An empirical study of 201 Canadian manufacturing SMEs was designed to answer the following research questions: What is the relationship between levels of network development, market
development and product development? What is the impact of the entrepreneur on his or her firm’s level of organisational development? What is the impact of organisational development on enterprise performance?

2. Organisational Development of SMEs

Authors such as Ansoff (1957) surmised early on that SMEs could develop themselves along two axes, namely markets and products. Increasing sales of existing products to existing markets (market penetration), finding new markets for existing products (market development), creating new products for existing markets (product development), and creating new products while for new markets (diversification) constitute four basic growth strategies for these organisations. More recently however, with the advent of globalisation, new organisational forms such as the “extended” enterprise, and new information and communication technologies in particular, some small and medium-sized firms, and high-growth firms in particular, have been found to develop themselves along a third axis, that is in terms of networks that link them with customers, suppliers, peers, and other business partners in collaborative relationships (Morgan and Hunt, 1999). The typological schema presented in Figure 1 indicates that SMEs are considered to be “world-class” when they are sufficiently developed along all three axes to be competitive on a global scale (Harrison, 1998).

![Figure 1: Axes of SME development](image)

Each axis of development has been subjected to empirical investigations seeking to understand three basic question. The first question is concerned with understanding the nature of the development activities themselves, be they related to internationalisation, innovation or networking. The second regards the environmental, organisational and individual determinants or antecedents of these activities. The third is concerned with identifying the impacts or consequences of organisational development, especially upon organisational performance.

In SMEs, researchers have looked at the product innovation process in particular, including its entrepreneurial and internal context (resources and organisation), and its effect on performance (e.g., Koufteros et al., 2002; Simon et al., 2002; van Dijk et al., 1997). The exporting activities of small firms have also been examined, focusing on the determinants of their export propensity and export success (e.g., De Toni and Nassimbeni, 2001; Moini, 1995; Sharmistha, 1999; Wolff and Pett, 2000). Finally, the participation of entrepreneurs and their firm in various types of social or commercial networks has been studied as to its nature, antecedents and consequences (e.g., Ebers and Jarillo, 1998; Freel, 2000; Hakansson and Schakenraad, 1994), including the effect of networks upon the exporting and innovation activities of SMEs (e.g., Hanna and Walsh, 2002; Lee and Jang, 1998).
3. Research Model and Hypotheses

Given the research questions posed and the literature reviewed, the present study seeks to deepen our knowledge of organisational development in SMEs by proposing and testing a model that comprises three sets hypotheses. As shown in Figure 2, the first set is concerned with the entrepreneurial and strategic environments that are associated with organisational development, i.e., that are conducive to higher levels of network, market and product development in small and medium-sized manufacturing firms. The second set postulates network development as an antecedent to market and product development in these firms, whereas the third set of hypotheses focuses on the performance impacts of organisational development.

Small firms are deemed to be “organic” to the extent that their strategy, structure, and culture are embodied by their owner-managers. The primary goals and characteristics of entrepreneurs are thus crucial in determining the firm’s level of innovation and orientation toward product novelty and technological sophistication (Miller, 1993). In this regard, studies have shown that the previously acquired knowledge and experience of small business owners condition their managerial behaviour (Thong, 1999). In addition, a key component in the small firm’s learning experience is the owner-manager’s individual learning (Riemenschneider and Mykytyn, 2000). Domain-specific knowledge that comes with experience in a specific manufacturing sector as well as more general knowledge obtained from a higher education would thus influence the entrepreneur’s awareness of the various organisational development practices to be assimilated and integrated by the organization, hence the first research hypothesis:

H1a - Organisational development will be influenced by the education and experience of the SMEs’ owner-manager.

A firm’s strategic orientation or posture is its response to its environment. As this environment becomes more hostile or complex, SMEs with an aggressive, entrepreneurial orientation increase their competitiveness by seeking new markets and putting emphasis on technological leadership and new product innovations (Özsomer, Calantone and Di Benedetto, 1997). This broad orientation translates into a manufacturing strategy based on cost and/or differentiation and/or strategic alliances that require increasing integration or flexibility, product variety, quality, and precision (Dean and Snell, 1996). Given that development practices such as the adoption of advanced manufacturing technology has been linked to its manufacturing strategy (Lefebvre et al., 1992), the next hypothesis follows:

H1b - Organisational development will be positively influenced by a more aggressive strategic orientation.

Figure 2: Research model of SME development
Given the new threats and opportunities in its environment brought about by globalisation, and its own strengths and weaknesses in terms of flexibility an resources, many manufacturing SMEs view their participation in new forms of organisation based on dense networks as their principal mean of development (Julien and Lachance, 2001). To be in a better position to seize opportunities and compensate for weaknesses, small firms wanting to expand into new markets can establish distribution or marketing partnerships with other firms at home or abroad (Sethuraman, Anderson and Narus, 1988). SMEs can also establish design and R&D partnerships with competitors, prime contractors to reduce commercial uncertainty (St-Pierre and Mathieu, 2003), and research centres and/or universities to increase their capacity for innovation and product development (van den Ende and Wijnberg, 2001), thus the hypothesis that follows:

H2 - The development of the manufacturing SME’s networks will positively influence the development of its markets and the development of its products.

The development of new markets, new products, and networks is not end in itself for the manufacturing SME but a mean to enhance its operational, financial, and competitive position, subject to the specific strategic objectives of the entrepreneur (growth versus perenniality and autonomy) (Julien and Marchesnay, 1996). Thus, SMEs may seek to export and create new products to increase their sales when local markets are stagnant. Innovation may be used to render the firm more profitable by reducing manufacturing costs (Docter, van der Horst and Stokman, 1989). Whereas participating in networks may render the SME more productive by enhancing its supply chain management (Raymond and Blili, 1997) and its customer relationship management (Kalwani and Narayandas, 1995). Given that specific organisational development practices such as exporting, innovation and R&D, and strategic alliances have been previously linked to small business performance, the last hypothesis is the following:

H3 - The organisational development of a manufacturing SME will positively influence its organisational performance.

4. Methodology

The data used in the study were obtained from the LaRePE (Laboratory for Research on the Performance of Enterprises, www.uqtr.ca/inrpme/larepe) database that contains information on 201 manufacturing SMEs located in the province of Quebec, Canada. With the collaboration of a 850-member industry association to which most of these firms belong, the database was created by having the SMEs’ chief executive and functional managers 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 are provided with a complete comparative diagnostic of their overall situation in terms of performance and vulnerability. The number of employees of the sampled organisations ranges from 6 to 405, with a median of 49, while annual sales range from 0.4 to 55 million dollars, with a median of 5.3 million. Over fifteen industrial sectors are present, including metal products (30% of the sampled firms), wood (14%), plastics and rubber (9%), electrical products (8%), food and beverages (7%), and machinery (5%). These firms are fairly representative of Canadian manufacturing SMEs in terms of size and sector.

As the key informant on the firm’s strategic orientation, the CEO is asked to rate the aggressiveness with which new markets were developed and new products are launched, and the proactiveness with which new technologies are introduced, on scales adapted from Covin and Slevin (1989) and Julien and Raymond (1994). The level of network development is measured by the number of distribution, marketing, design and R&D partnerships established by a firm with customers, suppliers and other third-parties such as research centres. Market development is measured by the percentage of sales that is exported and by the frequency with which the firm prospects for new markets (St-Pierre, 2003). Product development is measured by three ratios : product R&D budget over sales, sales of new and modified products over sales for the last two years, and number of R&D employees as a percentage of total labour force (Raymond and St-Pierre, 2002; St-Pierre and Mathieu, 2003). A first dimension of organisational performance, namely productivity, is measured by one indicator, gross margin per employee. A second dimension, growth, is assessed by the average sales increase over the last three years. The third dimension, profitability, is measured by one commonly used ratio, the net margin (net profit / sales). While many other indicators can be employed, these last three are fairly representative and comprehensive in expressing information on operational and financial performance.
5. Results and Implications

In terms of size, the median SME has 44 employees, with a minimum of 6 and a maximum of 406, whereas its median sales are equal to 5.3 million (Canadian dollars), with a minimum of 0.4 and a maximum of 55. The descriptive statistics of the research variables follow in Table 1.

To test the multivariate relationships hypothesised by the research model, structural equation modelling was also used. The partial-least-squares (PLS) method was chosen in preference to the better-known method implemented in the LISREL program, since it is more appropriate in the initial phase of developing and verifying theories (Fornell and Bookstein, 1982). PLS is also robust in that it does not require a large sample or normally distributed multivariate data (Fornell and Larcker, 1981). Figure 3 summarises the results obtained.

Table 1: Descriptive statistics of the research variables (n=201)

<table>
<thead>
<tr>
<th>variable</th>
<th>mean</th>
<th>med.</th>
<th>s.d.</th>
<th>min.</th>
<th>max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education and Experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>education level of the owner-manager(^a)</td>
<td>3.3</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>experience in industry (number of years)</td>
<td>17</td>
<td>15</td>
<td>10</td>
<td>1</td>
<td>45</td>
</tr>
<tr>
<td>Strategic Orientation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>development of new markets and products(^b)</td>
<td>2.2</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>introduction of new technologies(^c)</td>
<td>3.0</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>Development of Networks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>distribution partnerships(^d)</td>
<td>0.6</td>
<td>0.0</td>
<td>0.9</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>design and R&amp;D partnerships(^d)</td>
<td>1.1</td>
<td>1.0</td>
<td>1.4</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>marketing partnerships(^d)</td>
<td>0.8</td>
<td>0.0</td>
<td>1.1</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Development of Markets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sales exported / sales</td>
<td>19.3</td>
<td>5.0</td>
<td>27.7</td>
<td>0</td>
<td>99</td>
</tr>
<tr>
<td>frequency of prospecting for new markets(^e)</td>
<td>3.3</td>
<td>3.0</td>
<td>1.3</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Development of Products</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>product R&amp;D budget / sales</td>
<td>.017</td>
<td>.003</td>
<td>.047</td>
<td>.000</td>
<td>.359</td>
</tr>
<tr>
<td>no. of R&amp;D employees / no. of employees</td>
<td>.041</td>
<td>.020</td>
<td>.080</td>
<td>.000</td>
<td>.720</td>
</tr>
<tr>
<td>sales of new and modified products / sales(^f)</td>
<td>0.37</td>
<td>0.25</td>
<td>0.34</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Profitability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>net margin (%)(^g)</td>
<td>3.98</td>
<td>3.79</td>
<td>6.47</td>
<td>-25.54</td>
<td>29.94</td>
</tr>
<tr>
<td>Productivity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gross margin per employee (%)(^g)</td>
<td>1.75</td>
<td>0.69</td>
<td>3.04</td>
<td>0.06</td>
<td>22.29</td>
</tr>
<tr>
<td>Growth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>annual sales growth (%)(^g)</td>
<td>16.3</td>
<td>12.4</td>
<td>26.6</td>
<td>-46.7</td>
<td>111.6</td>
</tr>
</tbody>
</table>

\(^a\) grade school (2.5%) : 1, high school (19.5%) : 2, college (27%) : 3, university (51%) : 4
\(^b\) reactive (28%) : 1, defensive (24%) : 2, innovative (48%) : 3
\(^c\) very prudent (9%) : 1, prudent (27%) : 2, competitive (24%) : 3, innovative (40%) : 4
\(^d\) number of partnerships with prime contractors, customers, suppliers, competitors, research centres, colleges and universities, and other SMEs
\(^e\) low frequency : 1, 2, 3, 4, 5 : high frequency
\(^f\) for the last two years
\(^g\) average for the last three years

5.1 Test of the measurement model

The PLS method simultaneously assesses the theoretical propositions and the properties of the underlying measurement model. Internal consistency of measures, i.e., their unidimensionality and their reliability must be verified first. The observable variables measuring a non-observable construct (or latent variable) must be unidimensional to be considered unique values. Unidimensionality is usually satisfied by retaining variables whose loadings (lambdas) are above 0.5, indicating that they share sufficient variance with their related construct. A loading of 0.45 thus indicates that one variable, the percentage of sales of new or modified products, does not load sufficiently on its associated construct and could be removed from the measurement model.
Reliability can be verified by considering the value of the rho coefficient, defined as the ratio between the square of the sum of the loadings plus the sum of the errors due to construct variance. A rho greater than 0.7 indicates that the variance of a given construct explains at least 70% of the variance of the corresponding measure, as is the case for all constructs in the research model (see Table 2). The third property to be verified is discriminant validity. It shows the extent to which each construct in the research model is unique and different from the others. The shared variance between a construct and other constructs (i.e., the squared correlation between two constructs) must be less than the average variance extracted (i.e., the average variance shared between a construct and its measures). Table 2 shows this to be the case for all eight constructs.

Figure 3: Test of the research model (PLS, n=201)

Table 2: Reliability and discriminant validity of the research constructs

<table>
<thead>
<tr>
<th>construct</th>
<th>ρα</th>
<th>1.</th>
<th>2.</th>
<th>3.</th>
<th>4.</th>
<th>5.</th>
<th>6.</th>
<th>7.</th>
<th>8.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education and Experience</td>
<td>.78</td>
<td>.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic orientation</td>
<td>.78</td>
<td>.04</td>
<td>.80</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of networks</td>
<td>.87</td>
<td>.13</td>
<td>.09</td>
<td>.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of markets</td>
<td>.70</td>
<td>.21</td>
<td>.19</td>
<td>.21</td>
<td>.73</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Development of products</td>
<td>.78</td>
<td>.17</td>
<td>.31</td>
<td>.16</td>
<td>.75</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profitability</td>
<td>1.0</td>
<td>-.11</td>
<td>-.04</td>
<td>.09</td>
<td>.15</td>
<td>-.09</td>
<td>1.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Productivity</td>
<td>1.0</td>
<td>-.02</td>
<td>.08</td>
<td>.05</td>
<td>-.04</td>
<td>.17</td>
<td>.21</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Growth</td>
<td>1.0</td>
<td>.09</td>
<td>.11</td>
<td>.05</td>
<td>.18</td>
<td>.21</td>
<td>-.16</td>
<td>-.10</td>
<td>1.0</td>
</tr>
</tbody>
</table>

ρα = reliability coefficient = \((\Sigma \lambda_i)^2/((\Sigma \lambda_i)^2 + \Sigma(1-\lambda_i^2))\)

Diagonal: (average variance extracted)\(^{1/2}\) = \((\Sigma \lambda_i^2/n)^{1/2}\)

Sub-diagonals: correlation = (shared variance)\(^{1/2}\)

The first research hypothesis, namely that the owner-manager’s education level and industry experience influence the organisational development of his or her firm, is confirmed by significant path coefficients for market (γ = 0.18) and product development (0.14), but not so for network development (0.13). Note the negative sign for the experience variable, meaning that while higher education is associated with higher levels of...
development, greater industry experience is associated with less development. This result supports the notion that younger, less-experienced but better-educated entrepreneurs are more motivated by growth, seeking through internationalisation and innovation to eventually achieve “world-class” status for their firm.

The hypothesis that a more aggressive strategic posture is conducive to organisational development is also confirmed by significant path coefficients, for market ($\gamma = 0.17$) and especially for product development (0.29) but again not for network development (0.08). SMEs in which the competitive strategy is based on regular new launching new products, or on maintaining market share with existing products by lowering their or increasing their quality would thus tend to put more emphasis on organisational development. Similarly, firms whose strategic orientation toward the introduction of new technologies is more proactive so as not to lag behind the competition would also tend to be more proactive in terms of market and product development.

As predicted in hypothesis 2, the positive influence of network development on market development is confirmed by significant path coefficients ($\gamma = 0.17$). SMEs whose networks are denser in terms of the number and nature of partnerships or alliances established with other organisations achieve higher levels of internationalisation through exporting and prospecting. In the same manner, network development positively influences product development ($\gamma = 0.12$). Innovation and R&D activities thus require small firms to establish more ties with its environment, both weak and strong, to obtain the “rich” information that is essential to the success of such activities.

As predicted in hypothesis 3, growth is positively influenced by market ($\gamma = 0.15$) and product development ($\gamma = .19$), but not to network development ($\gamma = .02$). Expanding markets and product lines would evidently help SMEs to attain a status as a high-growth firm or a “gazelle”. Profitability is also positively influenced by market development ($\gamma = 0.17$) but negatively by product development, and again not by network development ($\gamma = -.13$). Expanding markets should allow the small firm to be more in control of its prices, and thus achieve higher returns. The negative result can be explained by the added investment required for the design and R&D activities to create new or modified products, which would pay off in the longer term through more competitiveness but reduce profits in the shorter term. Productivity for its part is only influenced by product development ($\gamma = 0.18$), the other two path coefficient for market ($\gamma = -.07$) and network development ($\gamma = .05$) being non significant. As R&D costs are not taken into account by the gross margin, R&D activities that generate added value (quality) to products would allow the firm to sell them at a higher price with the same labour, thus increasing productivity.

Overall, this also indicates that the influence of network development on performance is indirect rather than direct, that is, through its influence on the other two dimensions of organisational development. Note also in Table 2 that while productivity and profitability are positively correlated ($r = .21$), growth is negatively related to profitability ($r = -.16$). Globally, export activities and R&D intensity explain a significant amount of variance in productivity (4 %), growth (7 %) and in profitability (4 %). There are obviously many other factors that explain why certain manufacturing SMEs are more productive and profitable than others such as the quality of their management and labour force, and the sophistication of their information and production technology. To the extent that organisational development requires level changes in these factors, productivity, growth and profitability will be affected.

Given the antecedents of organisational development identified in this study, the basic link of organisational development with strategy stands confirmed, in accord with the entrepreneur’s individual motivations and objectives. How the owner-manager perceives new technology and the extent to which he or she pursues product and process innovation can thus be a predictor of the firm’s development. In this regard, identifying a mismatch between the firm’s manufacturing strategy and its level of development should trigger corrective action. One must also take into the new realities of global competition in which large and small firms work together within networks. Managers of small firms who enter into long term agreements with prime contractors or who act as subcontractors for a few large customers must be prepared to increase their firm’s development under pressure from their business partners. While investments in organisational development may be quite large and induce major changes, they should procure increased operational and business performance to the SMEs that make them.

There are also implications of these findings for the business models adopted by manufacturing SMEs. Returning to Figure 1, some of the firms studied can be characterised as “local”, being content to adequately serve a local market with one or two basic products, with minimal networking. Others can be qualified as “exporting” firms, attempting to reach new markets for their tried and true products, by establishing networks with distributors or foreign partners. Some SMEs are more of the “innovative” type, seeking to expand sales in
their present markets by creating new products, including their participation in design and R&D networks. Finally, the “world-class” firms constitute the fourth type, advancing along all three development axes simultaneously, through dense networking, internationalisation, and innovation. It is thus important to understand the different types of manufacturing SMEs one is dealing with in order to support them appropriately (St-Pierre, Audet and Mathieu, 2003).

6. Concluding Remarks

With the advent of global competition and new organisational forms based on networks of collaborating firms, the organisational development of SMEs is essential for their survival, growth, and competitiveness. Given the dearth of empirical knowledge in this regard, the present study has contributed to a better understanding of the nature and state of organisational development in small manufacturing firms, and of the antecedents and outcomes of this development. It is recognised that these organisations are highly flexible and adaptable to change, be it environmental, operational or technological. Some of these are already world-class enterprises and, in the now global business environment, others must follow suit with internationalisation, innovation and networking to improve their competitive position. Organisational development efforts cannot insure greater performance unless they are coherent with the competitive environment, strategic goals, and structure of manufacturing SMEs. To this end, these organisations must increase their ability to manage their development, and thus will require continued support from researchers and practitioners.

Acknowledgement

The authors would like to thank the Canada Research Chairs Program, the Canada Foundation for Innovation, and Canada Economic Development for their financial support of this research.

References


**Louis Raymond**, Ph.D., Canada Research Chair on Enterprise Performance, is Professor of information systems at the Université du Québec à Trois-Rivières. His research has been published in journals such as the MIS Quarterly, Entrepreneurship Theory and Practice, and the Journal of Management Information Systems.

**Josée St-Pierre**, Ph.D., J. Armand Bombardier Chair on Interenterprise Relations and Risk Management, is Professor of finance at the Université du Québec à Trois-Rivières. Her research has been published in journals such as the Journal of Corporate Finance, Small Business Economics, and the Canadian Journal of Administrative Sciences.