



Pergamon

Technovation 23 (2003) 705–715

technovation

www.elsevier.com/locate/technovation

Linking manufacturing improvement programs to the competitive priorities of Canadian SMEs

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Abstract

The capacity of small manufacturing firms to maintain reliable and continuously improving manufacturing processes appears to be a key condition for ensuring long-term sustainability. Governments have been very active in helping them tackle this challenge, in particular by supporting the adoption of world-class manufacturing practices. Despite the many benefits of this support, its application is not always based on exhaustive knowledge of the target firms. Programs aimed at the wholesale promotion of technology, without reference to the competitiveness orientations of the firms concerned, can produce unsatisfactory results. The study described here examines this issue based on a survey of 229 small and medium-sized manufacturing enterprises (SMEs) having received assistance under such a program. Four separate positioning profiles emerge from the study, namely potential practices, emergent practices, priority practices and realized practices. The study also provides a way to associate manufacturing improvement programs and practices with the competitive positioning sought by SMEs. The results of the research should be extremely useful to business assistance programs and to corporate decision-makers.

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Keywords: Improvement programs; SMEs; Manufacturing strategy; Value-added production

1. Introduction

The increasing availability of reliable advanced manufacturing technologies and improvement programs offers a real potential weapon for manufacturing SMEs trying to cope with today's challenges of changing markets and rapid development. When coupled with appropriate corporate and manufacturing strategies, new technologies offer a way of improving both financial and non-financial performance (Cagliano and Spina, 2000; Lefebvre et al., 1995; Bessant, 1994).

This is particularly valuable in a context where firms are competing on a much broader scale than ever before. Managers must deal with a high level of complexity that affects many of their firms' assets, including the customer base, the product line and the relationships with business partners. With regard to the customer base, it is clear that a growing number of SMEs need to conduct

part of their business activities on foreign markets (OECD, 1997; Wagner, 1995; Bonaccorsi, 1992). In small domestic markets in particular, SMEs are forced to seek new opportunities beyond national borders. This in turn creates additional pressure to strengthen technological and organizational capabilities. Complexity also affects the way products and services are developed and delivered to customers. Today's intense competition requires that firms excel simultaneously in several areas without trade-off, including innovativeness and responsiveness to their customers (Small and Yasin, 1997; Hill, 1994). The last decade has also brought major changes in the way business partners deal with one another. The intense development of information technologies (including the Internet) has generated new opportunities for improving the way products are designed, developed and sold on industrial markets. The resources invested in the development of supply-chain management systems in large firms are a typical example of the pressures that SMEs—which often act as subcontractors—must face vis-à-vis an increasing demand for quality and flexibility (Lefebvre et al., 2001).

In such a challenging environment, the capacity of a

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firm to maintain reliable and continuously improving business and manufacturing processes appears to be a key condition for ensuring its sustainability in the long run. Over the years, many SMEs have chosen to embark on a renewal of production technologies as well as improvement programs that have yielded positive results in larger firms (e.g. ISO standards). Although the adoption rate of such practices seems to be reasonably high among SMEs (Swamidass, 1995), empirical evidence has also shown that the mere fact of adopting technologies and improvement programs does not guarantee immediate benefits or immediate performance improvements. Several empirical studies indicate that while most firms do obtain some benefits (De Meyer and Ferdows, 1990; Bartezzaghi and Spina, 1998; Boyer, 1998), some implementation projects do not lead to full exploitation of the system's capabilities (Boyer et al., 1997; Small and Yasin, 1997). In many cases, too much focus on a few specific and well-publicized improvement techniques such as JIT and TQM is both inadequate and ineffective. A 'pick and choose' strategy such as this may have a lesser impact than a more systematic approach combining technology and organizational characteristics. Research has shown that improvement programs will not generate tangible and positive results unless they are clearly in line with the firm's strategic orientations (Gilgeous and Gilgeous, 1999; Allen, 2000).

The aim of the paper is to shed some light on these issues by proposing an original way of linking manufacturing improvement programs and practices to strategic orientations of small and medium-sized firms. This study has been conducted in the context of a Canadian province where lots of efforts have been invested, over the years, by the government agencies in the promotion of an integrated approach, aimed at improving the manufacturing competitiveness of these firms. More specifically, this government's approach was designed to get manufacturing firms to increase the value of their production by specifically seeking three direct manufacturing improvement goals, namely improvement of response time, elimination of waste, and economies of scope. In more practical terms, it consisted in promoting the use of a series of world-class manufacturing improvement programs within the SME community and across a large range of industries.

2. Background: Manufacturing improvement programs for better strategic actions on the part of SMEs

Numerous studies have shown the value of improvement programs for the enhancement of competitive position (Swamidass, 1996; Meredith, 1987). Although some aspects of the new manufacturing program adoption process are still not fully understood (Lagacé, 2000),

particularly in the implementation process (Schroder and Sohal, 1999; Small and Yasin, 1997), there is nevertheless some agreement on the importance of linking the adoption of manufacturing improvement programs to the firm's corporate strategies. From the earliest studies in the early 1980s (e.g. Hayes and Wheelwright, 1984; Schonberger, 1982) to the empirical work done in the 1990s (e.g. De Meyer and Ferdows, 1990; Flynn et al., 1995; Kim and Arnold, 1996), research has confirmed the importance of linking such decisions to the firm's strategic priorities, in terms of their competitive position. Overall, this suggests that the choices made by decision-makers also need to be consistent with the firms' technical and organizational characteristics, as argued by Cagliano and Spina (2000):

Today's external consistency seems to demand: multiple simultaneous performance, rapid priority changes, responsiveness and timeliness, greater quality in working life and, in general, more involving and motivating tasks for an increasingly educated workforce. To match these requirements, internal consistency is also needed: global optimization, a process focus in organizational design, a perspective beyond rigid company boundaries, the development of internal capabilities and local problem solving, and the alignment of the manufacturing and new product development processes.

In practice, however, such coherence may be difficult to achieve, particularly for small firms. As shown in previous research, firm size does have a critical impact on the way firms are managed and a fortiori on the way new technologies or manufacturing improvement programs are acquired and adopted (Lefebvre et al., 1996; Gagnon and Toulouse, 1996; Robinson and Pearce, 1984). It has also been argued that the adoption of new manufacturing changes by SMEs may be hampered by the firms' rather limited financial and human resources. However, the flexibility often associated with SMEs may counterbalance this difficulty, provided that managers are capable of defining a clear manufacturing strategy (Chapman and Hyland, 2000). Other researchers have found that the drive to invest in new improvement programs is influenced mainly by senior management, regardless of firm size (Schroder and Sohal, 1999).

These mixed perspectives on the adoption of new manufacturing strategies in SMEs are certainly one of the reasons why many governments are actively creating support programs aimed specifically at those firms. Recognizing the key role they play in the economy (Schreyer, 1996), many governments deliberately engage in various forms of assistance, ranging from information services and training to financial support. The support option seems to be emphasized particularly in those cases where limited local markets create such a level of

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