



Manufacturing management programs: are developing economies bridging the strategic gap?

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Abstract

Over the past decade there have been a large number of significant innovations in manufacturing which have resulted in more flexible and cost efficient methods and higher quality products, as manufacturers have set about upgrading their processes, systems and performance. This study compares the use of technologies and improvement programs between OECD and Non-OECD countries, and also between small and large firms, and examines differences in the use and outcomes across the economies and different sized firms. The empirical analysis provides an opportunity to test whether the ‘capabilities’ or strengths of a firm can be linked to these activities and examines if developing economies are using technology or management programs such as quality management and business process re-engineering to catch up to manufacturers in developed economies. The analysis utilises data from the second International Manufacturing Strategy Survey (IMSS), which encompasses 703 firms in 23 countries.

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1. Introduction

Ferdows and de Meyer (1990) argue that lasting improvements in manufacturing need to be grounded on a hierarchy of performance in quality, reliability, flexibility and technological leadership. A fifth capability, speed of response, or time, has been added to the first four capabilities by more recent work (e.g. Bartezzaghi et al., 1994). These five capabilities describe a set of criteria for satisfying the market requirements of the manufacturing function. These capabilities should be used by managers to evaluate alternatives and as a means of identifying gaps in the capacity of the manufacturing function to satisfy market requirements (Slack, 1998). The manufacturing sector must ensure that it can compete in areas other than price, if it is to maintain its current importance to a nation’s economy. Manufacturing enterprises in both developed and developing economies need to improve their systems, processes and performance. Decisions regarding improvement to a firm’s manufacturing procedures should

be made within a strategic framework, with an emphasis on enhancing the organisation’s competitive advantage. The management of technologies involving the use of computer software and hardware in design and engineering, for example, have become vital to the manufacturing function, as well as impinging on a range of other functions and capabilities in the organisation. Similarly, improvement processes related to quality and others such as business process re-engineering, should be designed and implemented so that they strengthen the firm’s competitive position in the marketplace. Many of these programs and activities have been used for a number of years by manufacturing firms in developed economies, but they are not as widely utilised or diffused in many developing economies, which still rely on an excess supply of cheap labour as a source of competitive advantage. In general, larger firms have a greater capacity to introduce a wide range of programs, although some smaller firms may utilise certain activities in an effective manner.

This paper reports on past and planned activities in manufacturing and the payoff firms have experienced from past practices. The study seeks to examine differences in usage between firms in OECD economies and non-OECD economies and to compare the differences in the payoffs. This analysis seeks to determine if the divide between

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operations in developing and developed economies is reducing or if it is the case that operations in developed economies are still achieving greater payoffs than operations in developing regions such as South East Asia and Latin America. Consideration is also given to whether any of these differences are related to differences in firm size in OECD and non-OECD economies.

2. Literature

It is important that decisions concerning improvements to the manufacturing function are not made in isolation. The decision to introduce or upgrade technologies such as computer-aided design, computer-aided engineering, computer integrated manufacturing, automated guided vehicles or the now almost obligatory local area networks (LAN) should be made within a strategic context. As Price (1996) argues, the strategic objective of any business is to maintain a competitive advantage and to attain this goal it must manage its technologies. The management of these technologies involves all functions and capabilities in an organisation, but they are often seen as central to manufacturing. The same is true for improvement strategies such as continuous improvement programs, zero defect programs, business process re-engineering and concurrent engineering; all of these need to be introduced and implemented in ways that increase the firms competitive position in the marketplace. These types of activities and programs have been in place for a considerable time in Australian manufacturing companies and are relatively widespread. In a survey of firms involved in lean manufacturing in Australia (Sohal and Eggleston, 1994) 78% had adopted TQM, 61% were using JIT, 47% were practicing continuous improvement (Kaizen) and only 34% were using a kanban system. Of the firms surveyed 81% had adopted these practices within the last five years prior to 1994. Improvements, innovation and the adoption of technology are critical to the health of any economic sector, and manufacturing is no exception to this generalisation. As Erich Bloch maintains “Today success in the global marketplace means creating and applying new knowledge—which is to say new technology—faster than one’s competitors.” (Price 1996, 38).

Hamel and Prahalad (1989) see the development of technologies, interventions and improvement programs occurring within ‘a strategic context’ rather than a set of highly defined top down plans. The challenge for manufacturing managers is to encourage and at times empower employees to discover the means to accomplish the manufacturing function’s goals and objectives. The outcome of this will be a pattern of decisions that will result in an emergent strategy that may in fact challenge any deliberate strategy of the organisation, but at the same time will reinforce the capacity of the organisation to maintain or improve performance based on past experience.

Managers must create an environment that fosters the development of this capability within the organisation even through it seems to foster a culture that allows the existence of potentially contradictory strategies.

Some models of strategy (and particularly manufacturing strategy) development have been briefly mentioned; these models focus on an evolutionary or cumulative development of capabilities and strategic focus. The cumulative model (Slack et al., 1998) is based on the proposition that a comprehensive manufacturing capability is a progressive development in quality and dependability followed by the introduction of systems and technologies that increase flexibility, response times and reduce the cost of manufacturing. This is in line with the work of Mintzberg (1987) and the decision-making process put forward by Denton (1998), who maintains that business needs to make decisions to achieve goals using plans and tactics. In this process the organisation accumulates information that informs and at times alters choices and prior decisions by asking basic questions of the organisation such as ‘who are we, where do we want to go, how do we want to get there, how do we want to achieve our goal, and what will be the outcomes?’ So in introducing a technology or improvement program, managers should ask similar questions and, in particular, ask how does this fit with the firm’s overall strategy?

Significant problems can occur for enterprises when they attempt to introduce technologies and programs into manufacturing facilities in developing economies, and firms in the developed economies have experienced similar problems in the past. As Baranson (1971) pointed out many of the problems arise because the capabilities that the firms are trying to develop or acquire are the very capabilities they need to operate the technologies and implement the programs in the first place. For example, in introducing quality programs often the managerial philosophy in developing economies, according to Steenhuis (2000), is based on doing the best under difficult circumstances rather than a firm commitment to meet minimum specifications. This view when transferred to improvement programs such as continuous improvement is ‘why fix it if it works and keeps us in a job?’ A similar view is put forward by Mann (1989) who maintains that in plants operated by the American Motors Corporation, manufacturers of Jeeps in China, there was a lack of discipline and attention to maintenance as the Chinese managers were unable and unwilling to control the workforce. It may also be the case that in developing economies, firms introduce programs and technologies as an attempt to catch up with their competitors, without doing so in a strategic context. As far as outcomes in developing economies are concerned Steenhuis (2000) concludes that introducing technology does not result in substantial returns and improvements. This paper, in analysing the differences between OECD and Non-OECD countries, will seek to examine if there has been any changes to outcomes as a result of implementing

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