

An exploratory study of manufacturing strategy practices of machinery manufacturing companies in India

G.S. Dangayach^a, S.G. Deshmukh^{b,*}

^aDepartment of Mechanical Engineering, Malaviya National Institute of Technology, Jaipur 302017, India

^bDepartment of Mechanical Engineering, Indian Institute of Technology Delhi, New Delhi 110 016, India

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Abstract

This paper presents findings of a survey on manufacturing strategy practices adopted by the Indian machinery manufacturing companies (IMMC). Based on the survey, three companies have been selected for detailed case studies. Their experiences in the manufacturing strategy process are analyzed. Although the companies represented diversity in terms of product type, sales volume, and geographic location, they share several commonalities including use of advanced manufacturing technologies and use of several improvement techniques. The process of strategy formulation varied among the companies in terms of participants, complexity and degree of formalization. Competitive priorities, order winners and critical success factors are also identified for these companies. Based on strategic manufacturing issues, manufacturing competence index and business performance index for the companies has been worked out.

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1. Introduction

Manufacturing companies are under increasingly diverse and mounting pressures due to more sophisticated markets, changing customer choice and global competition. The market for products is becoming increasingly international. In such a competitive scenario companies have to search for new processes, new materials, new vendors, new shop floor design, and new channels to deliver their products and services at competitive price. Indian companies are no exception to this. Indian companies have quite often followed an

opportunistic approach to growth as opposed to a capability driven approach that seeks to strengthen key aspects of manufacturing and paid very little strategic attention to their shop floors in the last few decades [1]. This was reflected in poor quality of products, lack of awareness about competitiveness, and most importantly no integration of various business functions such as marketing/sales and production.

The industrial environment in India was traditionally identified by its regulative and protective characteristics. Till 1990, the Indian economy was inward-looking and protected from internal and external competition. In the absence of competition, firms did not develop the technological capability needed for penetrating the global market [2]. The short-term orientation was due to high cost of capital, frequent government policy changes, and highly protective environment [3]. The abolition of license system in 1991 meant the end of old regime of protection and control. Today

* Corresponding author. Tel.: +91 11 2659 1056;
fax: 91 11 26857753.

E-mail addresses: gsdangayach@excite.com (G.S. Dangayach),
deshmukh@mech.iitd.ernet.in (S.G. Deshmukh).

Table 1
Overview of Indian machinery manufacturing industry

Parameter	Unit	Value
Invested capital/worth	Billion US \$	4373
	% of total manufacturing sector investment	8.4%
Output	Billion US \$	803
	% of total manufacturing sector output	11.3%
Export	% of total export	0.8%
Employment	% of total manufacturing sector employees	8.5%

Source: Statistical Outline of India [4].

Indian industry is facing competition from imports and from multinational companies in the domestic markets. The new competition is in terms of reduced cost, improved quality, products with higher performance, a wider range of products and better service, all delivered simultaneously to enhance value to customers.

Indian machinery manufacturing companies (IMMC) meets the manufacturing requirements of a variety of sectors of the manufacturing industry. Indian machinery are a major source of inputs for the country's defense, railways and other infrastructural requirements. It is the basic industry providing "mother machines" (as the Chinese call it) to all sectors of the economy. It has performed its role of providing the latest, sophisticated in many cases, machining solutions, that make manufacturing more cost competitive. Table 1 shows an overview (output, exports, and employment) of IMMC. About 4373 billion US \$ worth of machinery industry, contributes to about 1% to the gross domestic product (GDP) of India [4]. This formed motivation for the study. In this light, manufacturing strategy is urgently needed for Indian firms to:

- respond to business strategy and corporate objectives,
- correct present weaknesses or to exploit strengths,
- cope with anticipated environmental changes,
- get distinctive competence which is currently not available,
- make manufacturing function strong,
- achieve internationally competitive performance objectives.

The specific objectives of this study are to:

- find practices followed by IMMC in relation to manufacturing strategy,
- assess competitive priorities of an organization,
- identify order winners for IMMC,
- explore activities of improvements,
- to establish relation between manufacturing competence index (MCI) and business performance index (BPI).

In this research, we conducted a survey of IMMC to get familiar with the practices adopted on manufacturing strategy. Companies are mapped for competitive priorities, order winners, position as per Hayes and Wheelwright's [5] model, and investment in improvement activities. Competitive priorities are major manufacturing objectives of a company, which includes quality, delivery, flexibility, cost and innovation. However order winners are the key criteria due to which customer buy the product. Order winners are such manufacturing related and non-manufacturing related criteria, which are provided by the competitors. Based on the survey, detailed case study of three companies has been conducted. We have also calculated manufacturing competence index (MCI) and business performance index (BPI) for the entire industry and case companies. The organization of the paper is as follows: Section 2 presents the literature review on manufacturing strategy. Section 3 describes the research methodology used. Survey findings are presented in Section 4. Case study of the three companies is given in Section 5. Section 6 deals with MCI calculations and Section 7 describes BPI. Section 8 proposes a linkage model. Conclusions and limitations of the study are given in Section 9.

2. Manufacturing strategy

Skinner [6,7] identified the absence of manufacturing function in the corporate strategic planning process. According to him manufacturing strategy can be used to exploit certain properties of manufacturing function to achieve competitive advantage. He suggested that a proper fit is essential between manufacturing and marketing and identified five decision areas for trade-off in manufacturing organization: plant and equipment, production planning and control, labor and staffing, product design and organization management. Later Hayes and Wheelwright [5] categorized manufacturing organizations in four stages according to manufacturing's strategic role. Stage I: organization reacts blindly to the demands placed on them from the top and offer no strategic advantage to the firm. Stage II: organizations follow the trends of industry practice. Stage III: organizations formulate and pursue manufacturing strategy and their business functions are well integrated. These companies screen every investment for consistency with business strategy. Difference between stage III and stage IV firms lies primarily in their pro-activeness. Organizations in stage IV are characterized by the following:

- Manufacturing is involved up front in major marketing and engineering decisions.
- Efforts are made to anticipate the potential of new manufacturing practices and technologies.
- Long-range programs are pursued in order to acquire manufacturing capabilities in advance of needs.

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