

# Analysis of the congruence between manufacturing strategy and production system in SMME

Kristina Säfsten<sup>a,\*</sup>, Mats Winroth<sup>b</sup>

<sup>a</sup>Department of Mechanical Engineering, Division of Production Systems, Linköping University, SE-58183 Linköping, Sweden

<sup>b</sup>Department of Industrial Engineering and Management, School of Engineering, Jönköping University, SE-55111 Jönköping, Sweden

---

## Abstract

A production system must reflect a company's manufacturing strategy and the chosen competitive priorities. Tools to assess the congruence between the manufacturing strategy and the production system can hence support the companies' competitive position. In this paper, the usability of an analysis model suggested by Miltenburg [How to Formulate and Implement a Winning Plan, Productivity Press, Portland, OR, 1995], aiming at mapping manufacturing strategy and production system, is investigated. The usefulness of the analysis model is investigated in terms of how easy it is to use and in terms of the obtained results. The investigation is performed by means of empirical studies in two medium sized manufacturing companies. The result is that the model seems to be useful in the sense that, if knowledge about the underlying principles in the analysis model is at hand, it is possible to investigate the congruence between a manufacturing strategy and a production system. It is, however, believed that the analysis model needs some further development to be considered an easy to use tool, e.g. for a SMME production manager. © 2002 Elsevier Science B.V. All rights reserved.

*Keywords:* Manufacturing strategy; Production system; Analysis model; SMME

---

## 1. Introduction

The research interest for manufacturing and the impact of manufacturing on the companies' financial results has been considerable ever since the beginning of the 20th century. The researchers have discovered that Japanese organizations have been in an exceptional position regarding long term approaches, which are required for effective management of manufacturing [1,2]. Toyota Company has been leading the progress in many respects and their production system has been described in detail [3,4]. The issue of being outstanding in manufactur-

ing, so-called world-class, has been discussed by several researchers [1,5,6]. It has also been shown through empirical studies that the originally suggested framework by Hayes and Wheelwright [1] is still valid [7].

It has been found in several studies [8], that it is hard for manufacturing to claim their proper status and position in many manufacturing companies. Manufacturing was recognized as only executing what others have decided. This attitude is even more surprising since many producing companies may tie up to 70% of their total capital in manufacturing related investments. The plan for how to use this large capital in the best possible way to get competitive advantages can be called manufacturing strategy. Hill [2] gave two ways in which manufacturing could strengthen a company:

---

\* Corresponding author.

E-mail addresses: krisa@ikp.liu.se (K. Säfsten), mats.winroth@ing.hj.se (M. Winroth).

- (1) provide manufacturing processes that give the company competitive advantages. These processes should be unique in one way or another and hard for other manufacturers to copy;
- (2) manufacturing could choose processes and infrastructure, which help the company to win orders and match them to the criteria that win orders.

These processes are building the production systems based on the strategies on operational level, i.e. the manufacturing strategies. The production system comprises the facilities, labour, and the managerial functions required to manufacture physical products and other outputs from material and other inputs [9]. To be supportive in the achievement of competitive priorities, it is essential that the production system reflects the chosen manufacturing strategy. A manufacturing strategy comprises:

a series of decisions concerning process and infrastructure investment, which, over time, provide the necessary support for the relevant order-winners and qualifiers of the different market segments of a company [2].

Is it possible to determine, or at least indicate, if a production system is supportive to the achievement of a company's competitive priorities? Chenhall [10] carried out a study focusing on one strategy, manufacturing flexibility. The results supported the view that the link between strategies of manufacturing flexibility and manufacturing performance is stronger where the management uses manufacturing performance as a part of the evaluation. This supports the findings of Drucker [11], Kaplan [12], and Vollman [13]. The complexity of the relationships between operations strategy and organizational performance has been thoroughly studied by Ahmed et al. [14]. Their main conclusion is that it is indeed important to have manufacturing strategies, but it is better for a company to focus on a few very important strategies than to try to implement 'all' strategies and in this way losing the possibility of evaluating the outcome.

Different analysis models have been developed describing the congruence between various aspects of the manufacturing strategy and the production system. Some indications on how to assess the support from the operations function are given by Slack et al. [15]. They describe the role and contribution from the

operations function in four stages, ranging from internally neutral to externally supportive. This description is to a large extent based on [1], who provide a tool for the assessment of manufacturing's strategic role. Hayes and Wheelwright [16] also introduced the well-known product/process-matrix. Hill [2] suggested product profiling as an analysis model for assessment of the match between market, product, and process. Draaijer and Boer [17] performed a large study, comprising 19 cases, testing a framework for evaluating production systems. Their conclusion is that the framework is useful when describing and analysing a production system and explaining its performance in the marketplace. The largest benefit of the analysis is however, that it forces the management to consider market demands, competitive position, business implications of production, control and maintenance technologies, and organizational arrangements.

As a mixture of these models and tools, Miltenburg [18] suggested an overall framework for performing an analysis of a company's manufacturing strategy in terms of congruence with the production system, its products, and its capabilities. The main structure can be seen in Fig. 1. Miltenburg originally presented the analysis in three steps, but during the work with the model it was found suitable to increase the steps to five. The different steps are further explained in Section 3.

Most of the examples given in the literature, where those tools are used, come from larger companies in the UK or the USA. Due to its comprehensive structure the analysis model described by Miltenburg [18] is assumed to be a suitable tool for a smaller company with limited resources. One single framework is sufficient to get an overview of the manufacturing situation in terms of congruence between manufacturing strategies and production systems. Apart from the relevance of investigating the usefulness of the analysis model per se, it is also interesting to study the applicability of the model within small and medium sized manufacturing companies (SMME<sup>1</sup>).

The purpose of the research described in this paper is to investigate the usability of the framework, sug-

---

<sup>1</sup>A distinction between small and medium-sized enterprises (SME) and small and medium-sized manufacturing enterprises (SMME) can be useful when focusing on the manufacturing organisations [19].

متن کامل مقاله

دریافت فوری ←

**ISI**Articles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات