

# Evolution in the strategic manufacturing planning process of organizations

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Received 11 August 2003; received in revised form 1 November 2005; accepted 9 November 2005

Available online 23 May 2006

## Abstract

This study examines how strategic manufacturing planning processes vary systematically with respect to planning characteristics, and how the planning process appears to evolve over time. Through an empirical evaluation of over 200 U.S. manufacturers, we document the existence of four strategic manufacturing planning groups. These groups vary with respect to the degrees of “rationality” and “adaptability” of planning. In addition, the strategic manufacturing planning history and level of planning maturity differs between these groups, providing evidence that the planning process changes and evolves over time from “non-rational adaptive” mode towards a more “rational adaptive” approach. Firms between these polar extremes appear to take different paths in their movement toward a “rational adaptive” mode, with some “focusing on rationality” first and others “focusing on adaptability” first. We also show that irrespective of the firm’s environment, a greater degree of “rational adaptivity” is correlated with better planning outcomes and business performance. As such, it represents a “best practice” approach to strategic manufacturing planning. Insights created by this work not only make an important contribution to the manufacturing strategy literature, but can also be used by senior manufacturing managers to facilitate their progress towards more effective planning.

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*Keywords:* Manufacturing strategy; Strategic planning; Empirical research

## 1. Introduction

Attention given to the manufacturing strategy by both academics and practitioners has been increasing since the time of Skinner’s (1969) seminal work in this area. Although obviously intertwined, work in the area has generally been categorized as addressing the

content, or “what”, of the manufacturing strategy rather than the process, or “how” the decisions are made. The vast majority of published work has focused on the content. Dangayach and Deshmukh (2001), in their extensive review of the manufacturing strategy literature, found that 91% (237 out of 260) of the published studies in the area addressed content issues and only 9% (23 out of 260) addressed process issues. But as Dean and Sharfman (1993) observed with respect to organization-level planning, the “how”, or strategic planning process, affects the “what”, or the resulting strategy. Thus there have been numerous calls for more work focusing on understanding the strategic planning process within the manufacturing

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area, and we address this need in the study described here.

An important part of the planning process is in understanding how the “objectives, policies, and plans are formulated” (Garvin, 1993). How each firm conducts its strategic manufacturing planning (SMP) is captured, in part, by the “strategic planning system”, which is the pattern of planning characteristics that organizes and coordinates the activities of those involved in the planning process (Lorange and Vancil, 1977; Lederer and Sethi, 1996). Even though the content and implementation of the strategy are important, the planning system itself does contribute to its success or failure. For instance,

“Managers have the power to influence the success of strategic decisions, and thus the fortunes of their organizations, through the processes they use to make key decisions.” (Dean and Sharfman, 1993, p. 399).

This paper conducts an empirical evaluation of how SMP processes and system evolve over time, and thereby seeks to contribute to the development of “a body of literature on the manufacturing planning process” (Adam and Swamidass, 1989, p. 183). In addition, research reported in this paper should assist firms in better understanding and improving the performance of their SMP system and eventually the bottom-line profitability of their firms.

In the next section, the relevant literature is reviewed and propositions are developed. Section 3 describes methodology-related issues pertaining to data collection, operational measures, and pre-testing and validation of the instrument. The results are presented in Section 4, and discussed in Section 5 along with the contributions and limitations of this research. The final section offers concluding remarks.

## 2. Theory and proposition development

### 2.1. Manufacturing strategic planning

Research in the manufacturing strategy process area, which has largely been exploratory, has focused on both formulation and implementation (Dangayach and Deshmukh, 2001; Leong et al., 1990). The work focusing on formulation has tended to address two major areas: design and planning. Within the design area, research has been conducted both at a macro-level (Kim and Arnold, 1996), addressing agreement between the manufacturing strategy and the business or marketing strategies (i.e., Fine and Hax, 1985; Garvin, 1993; Hill, 1996; Jouffroy and Tarondeau, 1992; Menda and

Dilts, 1997), and at a more detailed level (Kim and Arnold, 1996), focusing on what improvement programs should be pursued in support of certain competitive priorities. With respect to planning, a major stream of research includes case studies about the planning processes used by businesses to develop their manufacturing strategies (Blenkinsop and Duberley, 1992; Marucheck et al., 1990; Persson, 1991; Schroeder and Lahr, 1992; Voss, 1992). Finally, several tools have been reported to aid in the development of the manufacturing strategy (Crowe and Cheng, 1996; Platts and Gregory, 1990).

Less research has addressed specific characteristics of the SMP system. Marucheck et al. (1990) examined strategy formulation and implementation processes in six firms and observed several characteristics of the process. They observed that SMP tended to be top-down, done on a regular basis, and formal with respect to procedures and documentation. Anderson et al. (1991) also examined several process variables associated within strategic planning. Working with a larger sample of firms, they observed that manufacturing strategic planning was documented and was linked to the budgeting process. Mills et al. (1995) incorporated five different planning modes found in the strategic management literature (entrepreneurial, planning, ideological, adaptive and grass roots), that vary with respect to the degree of rationality and degree of emergence, in building a framework for designing the manufacturing strategy. Swamidass et al. (2001) examined planning with respect to whether it was top-down or an alternative to that approach. They proposed that alternatives exist to the traditional top-down approach including an emergent approach, adoption of improvement programs as a result of more bottom-up efforts, and one focusing on developing core competencies. Building on this research along with that found in the strategic management literature, Papke-Shields et al. (2002) examined in detail the planning characteristics of the manufacturing strategy formulation process. Finally, Lee (2002), in examining differences between the manufacturing strategy content and process in Japanese and Korean firms addressed several planning characteristics reflecting rational versus emergent approaches including flow and formality.

Several characteristics of planning approaches commonly discussed in the strategic management literature were identified in these studies. These include flow, formality, degree of documentation of the manufacturing strategy, an aspect of formality, frequency or intensity (identified by Lee, 2002; Marucheck et al., 1990; Mills et al., 1995; Swamidass et al., 2001)

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