The role of manufacturing and marketing managers in strategy development: Lessons from three companies

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Introduction

A dominant portion of manufacturing strategy literature (e.g. Adam and Swamidass, 1989; Baines et al., 1993; Fine and Hax, 1985; Garvin, 1993; Hayes and Wheelwright, 1984; Skinner, 1969; Swamidass and Newell, 1987; Ward et al., 1994) recommends that the various functions of a business, particularly manufacturing and marketing, should be on an equal footing in the strategy development process. However, research evidence suggests that this is not necessarily true in practice (Wheelwright and Hayes, 1985). Hill (1997) notes that, typically, there has been limited cooperation between the marketing and manufacturing functions. Wheelwright and Hayes (1985) and others have found that, often, the manufacturing function trails other functions in importance in the strategy development process. Similarly, observers (Marucheck et al., 1990; Wheelwright and Hayes, 1985) have found manufacturing in many firms to be reactive to marketing, which may be detrimental to the business. Skinner (1969) made a powerful observation that under a marketing-led business strategy, manufacturing strategy drifts into obscurity and may actually become a drag on the company. One consequence of this is that manufacturing priorities and strategies become rudderless and may not support business or marketing strategies.

By definition, manufacturing strategy content refers to priorities and patterns of decisions of the manufacturing function in the pursuit of competitive advantage. The process by which strategy is formulated and implemented addresses how strategic goals and decisions are reached in an organizational setting (Swamidass and Newell, 1987). A lopsided strategy development process can contribute to goal incongruence among functions. Goal incongruence refers to different functions of the same business pursuing incongruent goals; an example would be the marketing function pursuing strategic goals of product variety, which manufacturing is not capable of delivering. Where strategic goal congruence decreases, the potential for conflict between the two functions increases, which leads to poor corporate performance.

The research method includes a live presentation for about 30 minutes by one of the researchers to managers before they complete a data collection instrument. This design rules out mail and other surveys which can yield a larger sample.

Purpose

The broader objective of this study is to use a novel research method to open up new avenues for rigorous research of manufacturing strategy process. There are three specific objectives for this study; each objective is expressed in the form of a research question (RQ).

Strategic goal congruence between manufacturing and marketing

In their field study, Rho et al. (1994) concluded that manufacturing and marketing "Interface congruence is a prequisite to better competitiveness" (p. 38). They stressed that the importance of this congruence is enhanced in today's fast-changing and volatile market conditions.

Shapiro (1977) as well as Bozarth and Berry (1997) recognize the well-known incongruent behavior between marketing and manufacturing functions. With regard to the content of manufacturing strategy, Shapiro observes that the two groups of managers disagree on product variety, cost control, lead-time, delivery performance, and quality.

Since Shapiro's landmark work, several researchers have investigated the manufacturing-marketing relationship (Parente, 1998). Parente's review revealed that "process is … under-studied. Less than half of the papers under review include process variables …" This exploratory study uses a novel research method to study the involvement of manufacturing and marketing managers in the process of strategy development. The outcome, or content, of manufacturing strategy is important, too; strategy content is captured in the strategic goals set by manufacturing and marketing managers:

RQ 1: What is the nature and extent of strategic goal congruence between marketing and manufacturing managers?

Participation in the strategy development process

If manufacturing and marketing managers participate and contribute equally to the strategy development process, the potential for incongruent strategic goals between these functions can be reduced or eliminated (Hill, 1985; Voss, 1992). The second research question of this study investigates if marketing and manufacturing managers are equally involved in the strategy development process:

RQ 2: Are marketing and manufacturing equally involved in all the various steps of strategy development?

Managers' participation as the strategic role of manufacturing changes

Hayes and Wheelwright (1984) explain the strategic importance of the manufacturing function with their four-stage model (H-W model) of manufacturing's strategic role. In Stage 1 (internally neutral), manufacturing strategy seeks to minimize its negative contribution to the business, whereas in Stage 2 (externally neutral), capital investments assist manufacturing to catch up with the industry norm. In Stage 3 (internally supportive), manufacturing strategy and business strategy are made consistent by making investments in manufacturing in the light of business goals, and longer-term manufacturing developments are systematically addressed. Finally, in Stage 4 (externally supportive), manufacturing strategy results in world class manufacturing (WCM), where manufacturing is a competitive weapon. A premise of this study is that the participation of managers in the strategy development process is higher in plants that are in the upper stages of the H-W model:

RQ 3: How is the participation of manufacturing and marketing managers affected as the strategic role of manufacturing undergoes the changes described by the four stages of the Hayes and Wheelwright model?

Research methodology

The companies selected for the study are manufacturers in the USA and the UK. Data were collected from four companies, one in the USA and three in the UK. The Appendix details the key questions posed to managers in the plants. Table I summarizes the sample of companies.

Presentation and data collection

The research design required the marketing and manufacturing managers of a given subject company to hear a short 30-minute presentation of a multi-step manufacturing strategy development process that has been tried and tested in industrial settings (Mills et al., 1996). The manufacturing and marketing managers of a given company participating in the study may not necessarily be responsible for the same product line.

The presentation performed a norming function: that is, it ensured that managers across companies understood manufacturing strategy content and process uniformly. Additionally, variability in managers' understanding was controlled by using the same researcher to make presentations at all four plants. The purpose of this novel research method was to ensure that all managers participating in the study had a common understanding of what the strategy development process was.

The term "marketing manager" in the study refers to those who had responsibilities including, but not limited to, sales, as defined by Hahn et al. (1994). "Marketing" refers to the function implied in the studies by Ghose and Mukhopadhyay (1993), Konijnendijk (1994), Parente (1998) and Rho et al. (1994). For example, as part of marketing, Rho et al. include marketing strategy, coordination mechanisms, customer relationship development, and vendor

relationship development. Additionally, the marketing function is known to include channel management and distribution as well as sales and advertising.

We used Figure 1 as the basis for describing the strategy development process to managers from manufacturing and marketing. The five-step process in Figure 1 proposed and tested by Mills et al. (1996) has been developed over a number of years and successfully applied in a range of companies. The five steps are:

- Part 1: Identifying product groups. The company's products are divided into groups. Products within a group share a similar market or competitive environment.
- Part 2: What are the objectives of our business and functions? This stage generates a set of manufacturing objectives that are rooted in the business strategy.
- Part 3: What is our current strategy? Identify current strategy; use a strategy content charting tool (Mills et al., 1998) if necessary.
- Part 4: Can current strategy achieve our business objectives? This stage identifies gaps in current and planned strategic actions. It can assess the fit between company strategy and manufacturing capabilities.
- Part 5: Navigating towards our business objectives. This stage is the actual strategy formulation process.

After the presentation, the managers were given a short three-page questionnaire to gather information about the process of strategy development in their company. Some of the questions asked the managers to rate the use of the various steps in Figure 1 in their plant.

Findings

The findings on all three research questions showed consistent trends across Plants 1 to 3. However, Plant 4 displayed markedly different findings. We reasoned that this could be partly due to this plant being characteristically different from the three others in the sample (Table I). The company is very small, only 60 employees, with correspondingly low annual sales. Further, Plant 4 is the only plant in the sample in the electronics industry, and it manufactures a sophisticated product for specialized applications. While the differences in company 4 are thought-provoking, more important to this study are the patterns consistently exhibited across the three large plants for us to draw conclusions; we treat company 4 as an outlier for the purposes of this study based on a few cases. Therefore, the remainder of the paper discusses findings from the first three plants. All three plants are industrial suppliers.

Validating the model of strategy process

First, we tested whether the strategy development process presented to the managers was a valid process in the opinion of the managers across all companies. Accordingly, after the presentation of the process in Figure 1, which was at the core of the presentation to managers, they were asked to complete a questionnaire that asked them if the manufacturing strategy process in the presentation would be "useful to you in the future?" The responses were collected on a seven-point scale where 1 = "not at all," and 7 = "Yes, absolutely."

On the above scale, the average response of marketing managers was 5.67(n = 5) and the average response of manufacturing managers was 5.75 (n = 6), with an average of 5.71 (n = 11) for all managers on a scale of 7.0. This response is considered to be a strong vote in support of the manufacturing strategy process in Figure 1, which was presented to the managers. Further, during the meeting, no manager questioned the credibility of the process. We consider the above as evidence of the validity of a key aspect of the study.

Strategic goal congruence between manufacturing and marketing

To assess manufacturing strategy content (Research question 1), we investigated the congruence between the responses of manufacturing and marketing managers on eight items that are important to product competitiveness in the market. The managers were asked to identify one or more competitive dimensions of their products from the eight options. The eight options given below were extracted from literature and approved by two of the authors with

years of background in manufacturing strategy research. Both manufacturing and marketing managers were directed to check all items in the following list that are critical to their company's competitiveness:

1. (1) Technological sophistication and product features.
2. (2) Flexibility to modify design to suit customers.
3. (3) Price.
4. (4) Lead-time.
5. (5) Delivery performance.
6. (6) Flexibility to modify delivery volumes.
7. (7) Quality conformance or perceived quality.
8. (8) Other, please explain.

The items in the above list are derivatives of the business and manufacturing strategy literature associated with the works of Hayes and Wheelwright (1984), Porter (1980), Skinner (1978), Swamidass (1986), Swamidass and Darlow (2000), Swamidass and Newell (1987), Ward et al. (1994), and others.

The responses from the managers are in Table II, where responses are arranged by company and by managers' function. The findings indicate that marketing managers consistently mention fewer strategic dimensions as critical to their competitiveness than manufacturing managers. Across all companies, manufacturing managers identify an average of 5.33 strategic priorities for their products, whereas marketing managers identify only 3.44 strategic priorities. This indicates that manufacturing managers feel they have to compete on more dimensions than their marketing counterparts. This finding is new and never reported in the literature. We suggest the following hypothesis for more rigorous investigation in the future:

H1: Manufacturing managers pursue a broader set of strategic goals than marketing managers.

In Table II, the strongest disagreement between marketing and manufacturing managers is on delivery performance (a difference of 2.67); while three manufacturing managers identified delivery performance as a key competitive dimension, only 0.33 marketing managers did so. This finding concurs with the finding of Shapiro (1977).

This is an important finding – that manufacturing and marketing managers disagree on the strategic role of delivery performance in their company. It appears that once a sale is completed, marketing managers mentally disassociate themselves from the delivery goal; does this mean marketing managers do not share in the responsibility of on-time delivery to customers? If so, this could be an irritant between the two functions.

By way of explanation, once an order is booked, marketing managers may train their eyes on the next order they want to land, while manufacturing managers assume the responsibility of on-time delivery for orders on hand. This finding gives rise to the following hypothesis for future investigation:

H2: An important source of conflict between the manufacturing and marketing managers is the differential in the strategic importance assigned to "delivery performance" by the two managers; manufacturing managers attach a significantly higher importance to "delivery performance" than their counterparts in marketing.

Table II also shows where agreement between the two managers lies. Both groups of managers agree on quality. The finding concerning quality disagrees with Shapiro (1977); while Shapiro noted that manufacturing and marketing managers disagreed on quality, this study finds that they agreed on quality, which is in line with a more recent finding by Ghose and Mukhopadhyay (1993). Since Shapiro's study, much has changed in the management of quality due to Japanese production methods. Therefore, Shapiro's findings should be discounted.

Actually, in the years since 1977, when Shapiro's work was reported, manufacturing has undergone substantial turnaround, which included a new capability to improve the overall quality level of manufactured goods without sacrificing cost. With much improved quality levels in manufactured goods, it is no wonder that manufacturing and

marketing managers are now closer in their perception of the importance of quality. Thus, this finding is consistent with a 20-year long trend in manufacturing, and, in turn, validates this study. Further, it gives rise to another hypothesis for future investigation:

H3: Manufacturing and marketing managers concur on matters concerning product quality.

Table II also shows that there is no notable disagreement on the strategic role of design flexibility between the two groups of managers. Shapiro (1977) noticed disagreement between manufacturing and marketing managers on matters such as product variety, new products, and design changes. However, with the rise of total quality management and manufacturing flexibility over the last ten years, manufacturers are now more flexible, and are capable of introducing products more rapidly (Swamidass, 1996; 2000). This may explain why manufacturing and marketing managers are now more in agreement on the strategic role of design flexibility in their company.

Participation in the strategy development process

In order to investigate the involvement of marketing and manufacturing managers in the strategy development process (Research question 2), the managers were asked if their company "carries out" each of the five steps in Figure 1. Their average responses are in Table III. In Table III, due to missing values in one company, the average for only four steps of the process is computed across the three companies. Overall, marketing managers perceive that the first four steps of the process are being used in their company; the average for all marketing managers on a seven-point scale is 5.19 (Table III), above the midpoint of 4. However, manufacturing managers do not agree with marketing managers on the use of these same steps of the process; their average of 3.67 (Table III) is below the midpoint. From these findings it may be observed that manufacturing managers may not be involved in the four steps as often or as deeply as marketing managers, which may be reflected as the perceived lack of the use of the process by manufacturing managers. This indicates manufacturing managers think that they are less involved in strategic decisions.

Further, it appears that the use of formal manufacturing strategy processes declines in the three companies after the initial steps: average ratings of use drop below the mid-point after Step 3 for marketing managers, and after Step 2 for manufacturing managers. These findings give rise to two more important hypotheses for future investigations:

H4: Marketing managers are more involved in the following four steps of strategy process than manufacturing managers: identifying product groups; setting business objectives; assessing current strategy; evaluating if current strategy can achieve company objectives.

H5: Manufacturers tend to employ the first three steps of the following stepwise strategy development process more than the latter steps: identifying product groups; setting business objectives; assessing current strategy; evaluating if current strategy can achieve company objectives; navigating towards business objectives.

Future investigations may look into the reasons why the use of the later steps of the manufacturing strategy development process tapers off. Could it be due to the extent of analyses and complexity of analysis? If so, management ought to consider analytical tools and organizational practices that simplify the process.

Managers' participation when the strategic role of manufacturing changes

Respondents were asked: "How much control do manufacturing personnel have over the evolution of the business?" The respondents chose one statement from the following, which correspond to the four stages in the Hayes and Wheelwright model:

1. (1) Very little control (Stage 1).
2. (2) Allowed to form plans, independent of business strategy (Stage 2).
3. (3) Manufacturing plans screened against business strategy (Stage 3).
4. (4) Manufacturing plans are key to business strategy (Stage 4).

The average response from the managers from each company was used to ascertain the plant's stage in the H-W model (Hayes and Wheelwright, 1984). Companies 1 and 2 were found to be at Stage 2, whereas the average response for the managers at company 3 was 3.5, indicating a stage in between 3 and 4, or 3+.

Table IV combines the findings for companies 1 and 2 (the Stage 2 companies), and compares them to the findings from company 3 (above Stage 3). This table enables us to compare Stage 2 and Stage 3+ companies. Table IV shows that manufacturing managers in a Stage 3+ company show greater involvement in the various steps of the strategy process than their counterparts in a Stage 2 company (4.75 vs 3.13). The same is true for marketing managers (6.50 vs 4.55). Thus, a notable finding is that, although the participation of manufacturing managers increases with each stage of the four-stage model, their participation is less than that of marketing managers at all stages. This gives rise to the following hypothesis for future investigation:

H6: Manufacturing and marketing managers participate more in the strategy formulation process as plants progress to higher stages on the Hayes and Wheelwright (1984) four-stage model; however, the participation of manufacturing managers is less than that of marketing managers in all stages.

Validity, reliability and generalizability

The validity of the study was ensured by using as input to managers a manufacturing strategy development process that has been field tested and used in industry by Mills and associates (Mills et al., 1996). Similarly, the list of strategic goals presented to respondents is drawn from dominant literature. Further, the Hayes and Wheelwright (1984) framework employed here is also widely accepted, which ensures additional construct validity. In the future investigations, the question that is used here to position a company on the H-W framework could be improved. For example, multiple questions may be used for the purpose.

Even though a small set of cases are used here, the reliability of data collecting instruments was ensured across cases by using a formal data gathering document to ensure that the questions are consistently and uniformly worded across managers and companies.

Conclusions

Overall, this study has been successful. The proposed hypotheses above are a good summary of the findings of this study, but they also provide precise directions for more rigorous investigations in the future.

Regarding the first research question, relating to the strategic priorities, manufacturing managers do indeed pursue more strategic priorities than marketing managers across the three companies. This could be a source of unfocused manufacturing, or this places a greater burden on manufacturing managers. To ensure the validity of this line of research, it is important to compare manufacturing managers, who have a role in manufacturing strategy development and implementation, with marketing managers, whose responsibilities include sales as well as marketing strategy.

Findings show that manufacturing managers are less likely to participate in the various stages of the strategy process than the marketing managers. If this indicates that manufacturing managers are somewhat in the dark compared to their marketing counterparts, then manufacturing managers are more likely to be pursuing inappropriate strategic goals than marketing managers. This possibility deserves further in-depth investigation.

In this study, the plants were classified into Stages 2 and 3+ in the H-W model. However, none of the participating plants were classified into Stage 1 or Stage 4. An investigation of plants in all four stages is recommended, and such a study should enhance our understanding of the manufacturing strategy process in all manufacturing firms. Further, this study does not answer the question of precedence: Does the role of manufacturing and marketing managers in the strategy process increase as a company advances to a higher stage in the H-W model, or vice versa? This is to be investigated in the future.

This study is notable for using firms from the USA and the UK in the sample. This is justified because a recent study comparing manufacturing technology adoption practices in the USA and the UK found that the average manufacturing plants in the two countries are similar in many respects (Swamidass and Winch, 2000).

Table 1.Characteristics of participating companies

	Plant 1	Plant 2	Plant 3	Plant 4
Country	USA	UK	UK	UK
Employees at plant	900	420	450	60
Annual sales ($ million)	215	50	[a]	3.7
Products	Magnetic tape	Diesel engines	Steel strip	TV studio equipment
Share of principal market (%)	10-20	10-20	Over 30	Over 30
Number of direct competitors	1	3	2	1

Note: [a] = missing data (withheld)

Figure 1.Outline of the strategy process presented [not available on this version]

Table II.Important dimensions of competitiveness identified by marketing and manufacturing managers – Companies 1-3

Important dimensions for competitiveness	Company 1 (Stage 2) Mk[a] (n = 3)	Company 1 (Stage 2) Mf[a] (n = 3)	Company 2 (Stage 2) Mk (n = 1)	Company 2 (Stage 2) Mf (n = 1)	Company 3 (Stage 3+) Mk (n = 1)	Company 3 (Stage 3+) Mf[a] (n = 2)	Total Mk (n = 5)	Total Mf (n =6)	Difference (Mf-Mk)
1 Technical sophistication/product features	0	2/3	0	0	1	1	1	1.67	0.67
2 Design flexibility	2/3	2/3	1	1	1	1	2.67	2.67	0
3 Price	1/3	1/3	0	1	1	1	1.33	2.33	1
4 Lead-time	0	0	1	1	0	1	1	2	1
5 Delivery performance	1/3	1	0	1	0	1	0.33	3	2.67
6 Delivery volume flexibility	0	1/3	0	0	1	1	1	1.33	0.33
7 Quality conformance or perceived	1/3	1	1	1	1	1	2.33	3	0.67
8 Other, please explain	2/3	0	0	0	0	0	0.67	0	–0.67
Average number of items per respondent:	2.33	4	3	5	5	7	3.44	5.33	1.89
Total employment:	900		420		450				

Notes: [a] = Entries in these columns are averaged over the number of respondents.

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Appendix. Questions posed to managers

What is the total number of employees on site at this plant?

Are you a manager in manufacturing or marketing?

Rate, from 1 to 7, whether the following step of the strategy development process from our presentation would be useful to you in the future (1 = not at all, 7 = yes, absolutely).

Step 1: identifying product groups (1 2 3 4 5 6 7)

Step 2: What are our business objectives? (1 2 3 4 5 6 7)

Step 3: What is our current strategy? (1 2 3 4 5 6 7)

Step 4: Can our current strategy achieve our objectives? (1 2 3 4 5 6 7)

Step 5: Navigating towards our business objectives (1 2 3 4 5 6 7)

The complete five-part strategy development process (1 2 3 4 5 6 7)

How do your products principally compete? (Check as many as applicable)

Technological sophistication and product features

Flexibility to modify design to suit customer

Price

Lead-time

Delivery performance

Flexibility to modify delivery volumes

Quality conformance or perceived quality

Other, please explain:

Rate, from 1 to 7, whether you carry out the following steps of the strategy development process from our presentation (1 = not at all, 7 = yes, absolutely).

Step 1: Identifying product groups (1 2 3 4 5 6 7)

Step 2: What are our business objectives? (1 2 3 4 5 6 7)

Step 3: What is our current strategy? (1 2 3 4 5 6 7)

Step 4: Can our current strategy achieve our objectives? (1 2 3 4 5 6 7)

Step 5: Navigating towards our business objectives (1 2 3 4 5 6 7)

The complete five-part strategy development process (1 2 3 4 5 6 7)

How much control do manufacturing personnel have over the evolution of the business?

1. (1)=Very little control
2. (2)Allowed to form plans, independent of business strategy
3. (3)Manufacturing plans screened against business strategy
4. (4)Manufacturing plans are key to business strategy