# MANUFACTURING STRATEGY FORMULATION: A Process for the Identification of Market Qualifying and Order-Winning Criteria in Manufacturing Firms

by

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# Chapter 1. THE NATURE OF THE RESEARCH

This study concerns the process aspect of manufacturing strategy formulation. Specifically, it examines, in-depth, how managers in a manufacturing firm would go about determining the basis of competition for their products.

As an introduction to the thesis report, this chapter first provides a background for manufacturing strategy formulation process, describes the specific problem studied by this research, and explains the importance of the topic. This is followed by a summary of the research approach, definition of its scope, and the statement of study's contribution to knowledge. The chapter concludes with an outline of the remaining chapters' content.

## 1.1. Introduction and General Background

The reasons for the failure of the manufacturing function to achieve strategic competitive advantage were first highlighted by Skinner (1969) in his groundbreaking article, "Manufacturing -- Missing link in corporate strategy." This article both identified the problem and outlined several steps to overcome the failure to join manufacturing and organizational strategies. These ideas became the cornerstone of manufacturing policy and strategy research for over twenty-five years.

One finding which emerged during the research in the ensuing years is that few firms tailor their production systems to perform the tasks that are critical to corporate success. (Skinner, 1986) Indeed, many companies have no formal manufacturing strategy. (McGrath and Hoole, 1992) Instead, manufacturing opts for a blend of low costs, high quality, and acceptable customer service. (Hill, 1983a) What seems to be commonplace is a series of manufacturing decisions made at different times and under different conditions in the company's history. Without a meaningful strategy, firms often make short-term decisions that are in conflict with their long-term goals (St.John and Young 1992), which invariably result in a poor match between the key tasks undertaken by manufacturing and the business strategy pursued by the rest of the firm. Other sporadic attempts by many companies, such as the adoption of best-practice or panacea-driven approaches, which intend to emulate isolated, and well publicized, practices of some (mainly Japanese) firms, have also failed to provide sustained competitive advantage. (Pilkington, 1998) This problem is further underscored by the fact that although most firms within an industry share access to the same processing technology, manufacturing

systems, and infrastructure elements, they are not equally successful in linking those aspects to the criteria which form the basis of competition. (Hill, 1994)

Whereas literature in manufacturing strategy has seen rapid expansion in recent years, research on the process of manufacturing strategy formulation has been neglected in relative terms. (Adam and Swamidass, 1989; Leong et al., 1990; Voss and Winch, 1996) Among the most cited contributions (Wheelwright, 1978; Hayes and Wheelwright, 1984; Fine and Hax, 1985; Skinner, 1985; Platts and Gregory, 1992), a notable one is Hill's (1994) unique five-step process to develop a manufacturing strategy. According to this model, to effectively link the manufacturing strategy of a firm to the needs of the markets, critical competitive factors, or "order-winning and qualifying criteria," must be well understood and agreed upon both by marketing and manufacturing managers in the company. Although the concept of generic competitive factors has been a common content element of manufacturing strategy research, the way in which "qualifiers" and "order-winners" are positioned as an essential link between marketing and manufacturing strategies has an intuitive appeal for practitioners.[1]

As Skinner recently pointed out, the rate of adoption of manufacturing strategy techniques in industry has been very low. (Skinner, 1996) Consistent with this assertion, other than Hill's own writings, little descriptive detail exists in the literature on how practicing managers can go about assessing the market-related competitive factors for their firms.

## 1.2. The Specific Problem Studied

This research attempts to address the general gap in *process* aspect of manufacturing strategy formulation by examining one of its elements, the stage of determining how a firm's products compete in the marketplace. Hill's five-step process of formulating a manufacturing strategy (Hill, 1994) is used as the general framework. The process can be expressed as a chain of activities, starting with developing a clear set of corporate or business unit objectives. In step two an explicit marketing strategy, which directly supports those corporate objectives is articulated. The third stage (the focus of this research) involves the identification of the characteristics that help the company qualify and win orders in each of the market segments identified at the previous stage. This

[1] Details of Hill's approach and the suitability of its specific elements to this study are covered in chapter-2.

provides the necessary link to the establishment of a supportive manufacturing strategy in the subsequent stages, i.e., stage four, strategic choices of structural nature, and stage five, infrastructural decisions. These steps comprise the process of formulating a manufacturing strategy, which are followed by the realization of the necessary capabilities to improve business performance (i.e., implementation).

Correct execution of each one of those steps, including the stage of defining the order-winners and qualifiers (step 3), is necessary for successful implementation of the strategy. Hence the specific question this research attempts to answer can be expressed as follows:

> ***"How do operations managers determine the qualifying and order-winning criteria for their firms' products?"***

This basic research question was addressed within the context of six research propositions which were derived from the gaps identified through literature search (chapter 2, section 2.3).

### 1.3. IMPORTANCE OF THE TOPIC

The need to expand the theoretical and conceptual base in operations management, and particularly in manufacturing strategy, has been highlighted by several researchers. (Flynn et. al., 1990; Leong et al., 1990; McCutcheon and Meredith, 1993; Meredith, 1993; Westbrook, 1995) Coupled with this are repeated calls for higher managerial relevance and for deeper penetration of manufacturing techniques in the industry. Most vocal academics on these issues have been Skinner (1992; 1996) and Hill (1987; 1995; 1997). Both authors have reiterated the importance of developing concepts and usable techniques for practicing managers in manufacturing, and have put the responsibility for achieving this squarely on the researchers. Skinner asserts that "until we offer ... specific help in the form of such 'how to's, managers will be mystified, if not repelled, by the seemingly vague process of developing manufacturing strategies." (Skinner, 1996: 12) He also concludes: "... the literature contains certain ambiguities and lack of clarity, [and] lack of completeness in the 'how to's of implementing [manufacturing in the corporate strategy]." (p. 13) Similarly, Hill emphasizes the applied nature of the production and operations management (POM) field and sees researchers' role as being a "net contributor to the needs of business." (Hill, 1987: 8) Only by developing concepts

and testing them in today's industrial realities, he asserts, can academics contribute to knowledge that is relevant to managers. (Hill, 1997)

If practicing managers are in such need of tools to lead them through the 'how to's of formulating a manufacturing strategy, and if the determination of the criteria that enable companies to qualify and win orders in the marketplace is a key element of those 'how to's (section 1.2), then attempting to answer the research question stated above would be of significant value for operations managers. Put another way, since it is important for operations to focus its systems and resources on the specific criteria that directly contribute to the company's ability to compete, selecting those criteria correctly is key to the development of the right strategy. Having a usable tool (i.e., a process model tested in real life situations) to assist managers in that endeavor is, therefore, of utmost importance.

The outcomes of this research, in terms of the nature of the topic studied and the research methodology used, are also important for academic researchers. First, as will be shown in chapter 2, published literature on the mechanics of strategy formulation lacks both in quantity and in depth. Consequently the conceptual and theoretical base of the subject is underdeveloped. Furthermore, research methodologies best suited for studying business processes in real-life situations and for expanding on existing theories and building new theories (i.e., case and action research) have also been the least favored by majority of POM researchers (chapter 3). This has resulted not only in the strategy process to be under-researched, but, as importantly, in the lack of penetration of case study as a research tool rather than as simply a business school teaching tool. The approach taken in this research, i.e., in-depth study of strategy formulation process using case and action methodologies, therefore, sets out to fill an important void in academic research as well.

## 1.4. THE RESEARCH APPROACH

Since operations management is an applied science, the research conducted in this field must ideally take place in real life organizational settings, and produce results that are relevant to management practitioners. This points to the need for an empirical, field-based methodology. The type of research question addressed in this study (i.e., "how..."), the need to examine this question in a real-life setting, and the importance of including the context (the organization) in the phenomenon being

studied, all make *case study* and its special form, *action research*, the methodology of choice (details on methodology, and its justification are captured in chapter 3).

Five manufacturing companies were used in this multiple case study. In order to achieve a high level of reliability in observing the process "in action" and conducting within-case and cross-case analysis, a field procedure was prepared and carefully followed at each site. The use of multiple respondents at each company, and data triangulation through the examination of data from multiple sources, such as interviews, documentation, and participant observation, were central to the holistic approach taken in this study. This researcher's role during the fieldwork, however, was more involved than that of a typical case researcher's. Since the study involved in-depth examination of a specific process model at multiple sites, the researcher acted as a facilitator for the participants (functional managers), directing their efforts, involving them in the process, and observing them reach the conclusions on their own. These characteristics brought the methodology closer to action research (sections 3.3 and 3.4).

## 1.5. Scope and Key Assumptions

The study covers a specific stage of a typical manufacturing strategy formulation process, namely, the task of identifying the qualifying and order-winning criteria for a manufacturing firm. This task is widely seen as the key link between a firm's business/marketing and manufacturing strategies. The study investigates how firms can establish this link through the involvement of managers from different key functions. As stated earlier, it focuses on the "process" aspect of strategy, rather than its "content," i.e., the research propositions, the choice of research methodology, principal data collection techniques, and the structure of the primary conclusions were tailored to address "how" functional managers can go about achieving the task, rather than "what" those criteria should be.

As with any research, a balance needed to be struck between comprehensiveness and manageability of the study. To that extent, certain assumptions were made to define the scope and improve repeatability. They are listed below.

- The process model developed and subsequently applied to each firm was arrived at through literature search, identification of gaps in existing research, and incorporation of this

researcher's prior experience both in research and practice. The theoretical propositions embedded in the process model were then applied at multiple manufacturing sites using a rigorous, field-based research methodology in order to capture the dynamics of real life organizational settings. It did not attempt to determine the one best process for establishing the competitive factors for a firm, nor did it set out to compare two or more different processes.

- The study did not address the business and marketing strategy making processes in the firms studied—the first two steps of Hill's framework. However, in companies with documented strategic plans, it made extensive use of them as a means of data triangulation.

- Similarly, the last two stages of the manufacturing strategy process, the structural and infrastructural decisions, were also kept outside the scope of this study. However, as will be seen in chapters 5 and 6, an additional stage, translation of market-based criteria to manufacturing-based tasks, was found to be necessary between stages three and four.

- The study's use of sources of evidence, although wide-ranging, excluded the customers of the firms. The perspectives of individual functional managers were combined with evidence collected from other internal sources, which indirectly pointed to the factors that would be important to the customers. This internal assessment was seen as an essential first step—a prerequisite—towards achieving a comprehensive understanding of a company's markets, by encouraging the functional managers to think critically about their own business in a stepwise fashion. This way the firms can develop their own internal hypothesis as to how they qualify and win orders before potentially allowing the data coming directly from customers to override their judgement and make the process more complex and less manageable.

- As with most case study research, it was expected that certain stages of the study would have had to be modified as the idiosyncrasies of individual cases necessitated and as learning from early cases occurred. (Yin, 1989) Therefore some flexibility was built into the field procedure (section 3.5) to accommodate that need. Whenever those necessary deviations took place they were documented in the case descriptions (chapter 4) and discussion (chapter 5).

## 1.6. CONTRIBUTION TO KNOWLEDGE

Unlike in physical science research, relatively little descriptive detail is available in business literature to allow researchers and practitioners to duplicate and build on earlier studies. Few companies which may have conducted studies that generated practical knowledge may be closely guarding their work due to the competitive nature of their findings. Even when this is not the case, the results may not get published due to lack of time on the part of managers involved. These may at least partially explain the dearth of published studies on manufacturing strategy process research.

In addressing the calls from academics for an expanded theoretical and conceptual base in POM, for increased research on manufacturing strategy process, and for higher managerial relevance (see sections 1.3, and 2.2), this study sets out to contribute to knowledge not only in the research aspect of manufacturing strategy formulation, but also in management practice. The principal contribution revolves around the development of a tool, for practitioners and academics alike, for examining the order-winning and qualifying criteria for a firm's products as a key step towards formulating a coherent manufacturing strategy. More specifically, the main contributions of this research can be summarized as follows.

- The study addresses a real-life, complex, and typically unstructured, problem faced by functional managers in manufacturing companies. The proposed, applied, and, as a result, expanded, process model provides operations managers with a 'how-to' tool to help them tackle this task in their own companies. By adding to the pool of tested, documented, and usable techniques available to practitioners, this study fulfills one of the expectations from management research—that it be relevant.

- The depth and richness of information afforded by the field-based methodology allows future researchers and practitioners to get a glimpse into the actual "mechanics" of a portion of manufacturing strategy formulation process. Through its detailed description of the dynamics among functional managers, step-by-step account of the process progression and of the

idiosyncrasies of individual companies, the study highlights the multifaceted and complex nature of strategy formulation in multifunctional settings. This serves as a roadmap for future researchers (especially for those who have not yet attempted to use in-plant, case- or action-based methodologies) in designing studies which take into account organizational factors such as functional affiliation of participants, the subjective nature of survey responses, and the advantages and pitfalls of multifunctional group discussions.

- By exposing the vastly divergent views of functional managers within a firm, and revealing the contradiction between some of those views and data from other and more objective sources, this study contributes to the understanding of the risks associated with the use of questionnaire-based methodologies which target a single respondent in each firm. Although several authors have recently started advocating the use of more than one respondent, no other published study has so explicitly demonstrated the pervasive nature of this phenomenon[2]. The awareness generated by this research may help reshape the way future empirical studies, investigating both process and content issues in manufacturing strategy, are designed. While clearly demonstrating the importance of data triangulation in obtaining a more complete understanding of a firm's competitive market criteria, this study also points to the way triangulation should be achieved, i.e., not only by using multiple sources of the same type (surveying more than one respondent in each company), but also through the use of data sources of different types (unstructured interviews, documentation, and participant observation).

- In spite of the initial disparity in participants' individual perspectives, the research demonstrates that a facilitated group discussion, aided by the information obtained from other sources internal and external to the company, could be an effective way to bridge those gaps, improve collective understanding, and enable managers' transition to the subsequent stages of strategy formulation. Although the benefits of such a consensus-seeking approach for practitioners are more substantial, academic research in manufacturing strategy could also benefit from the use of this more inclusive and holistic method of surveying company executives.

[2] One exception is this author's earlier work (Menda and Dilts, 1997).

- This study also casts some doubts on the common assumption that respondents with such titles as manufacturing manager, director of operations, or vice-president of manufacturing are the most knowledgeable about their firms' markets and basis of competition (for example, see Ward et al., 1998). Sufficient evidence from the cases points to a general need for "handholding," facilitating, and guiding of participating managers at various stages of the process to help them better comprehend the conceptual difference between qualifiers and order-winners, and better assess the relative importance of those criteria. This further supports the need for operations management research that is close to plants and their people.

- Finally, the pervasiveness of the differentiated nature of the firms' markets or product lines points to the risks associated with aggregating companies' competitive market criteria or assessing only their primary product line. In uncovering the existence of several markets, product lines, customer types and levels[3], and the different ways in which participants segmented those markets, products, and customers, the study demonstrates the multifaceted nature of operations managers' task and further highlights the need to take a holistic and inclusive approach to manufacturing strategy research design.

## 1.7. The Structure of the Thesis Report

This report uses the standard linear-analytic structure and is organized in the following manner.

Following this introductory chapter which described the nature of the research, **chapter 2** contains a review of manufacturing strategy formulation process literature, and outlines several important gaps in existing research. These gaps are used to develop a primary research question and several related research propositions. A process model, structured around those propositions, provides the general framework for data collection in each replication (case study).

[3] Customer levels, as termed by this author, represent the different types of customers that "touch" a manufacturer's products until they reach the end-user. This issue is covered in detail in section 5.2.3.

**Chapter 3** starts with a review of research designs suitable for organizational and management studies, and continues with the justification of the specific design strategy used in this study. Following a detailed explanation of various data collection methods used, the chapter concludes with the presentation of the field procedure (study protocol).

Individual case descriptions are provided in **chapter 4**. Each description follows a sequential composition structured around the steps in the field procedure. A two-column structure aims to recount the outcomes of each process step and the related analysis in an easy-to-follow format.

**Chapter 5** is an in-depth analysis of within-case and cross-case patterns within the context of the research propositions. Some additional observations, relevant to the primary research question, but not initially included as part of the propositions, are also discussed here.

The report is concluded in **chapter 6** by a summary of the primary conclusions, presentation of the expanded process model, evaluation of research rigor, and a discussion of the study's limitations and suggestions for further research. Final remarks are also offered at the end of the chapter.

# Chapter 2. REVIEW OF PRIOR RESEARCH AND THE DEVELOPMENT OF RESEARCH PROPOSITIONS

## 2.1. Manufacturing Strategy Formulation Process

While the amount of literature in manufacturing strategy is expanding rapidly, research on the process of manufacturing strategy formulation has been relatively neglected and has not received sufficient field study. (Adam and Swamidass, 1989; Leong et al., 1990; Voss and Winch, 1996; Bozarth and McDermott, 1998) This point was given prominence during the Production and Operations Management Society's annual meetings in 1998 and 1999 with the formation of two panel discussions on the subject. The panels (which also included this author) attempted to explore the latest developments in the field of process research through the participation of leading academics and industry practitioners who stressed the need for more structured, and field-based process research. Prominent among the reasons prompting these calls for increased emphasis on the process aspect of manufacturing strategy are the lack of theories grounded in plant-based research (Platts and Gregory 1992), and the unexplored nature of the "mechanics" of manufacturing strategy formulation. (Swink and Way, 1995)

The beginnings of the published process research can be traced back to Skinner's seminal articles (Skinner, 1969; 1974), and his subsequent book "Manufacturing—The Formidable Competitive Weapon" (Skinner, 1985), in which he advocated a top-down manufacturing strategy generation approach to guide manufacturing managers in a structured way. Years later, in their exploratory study of the manufacturing strategy process, Marucheck et al. (1990) observed that within the six companies they studied, the top-down, hierarchical approach to strategic planning was dominant. Wheelwright (1984), Vickery (1991), Kim and Arnold (1996), and Quezada et al. (1999) similarly followed a uni-directional, top-down flow in formulating strategy. One notable departure was Hayes (1985), who suggested an alternative approach which he called the "means, ways, ends" flow. Here companies first develop broad-based internal capabilities and resources (means), then develop plans to exploit them (ways). Companies can then use these plans to shape their corporate objectives and explore new markets (ends). Although the author suggested that this bottom-up

approach should be used either in place of, or in conjunction with, the traditional method, he found the top-down method to be most common.

Most published work on this topic deals with the process aspect of strategy in a superficial manner by furnishing sets of guidelines for formulating a manufacturing strategy, rather than providing a detailed, step-by-step process flow. This way, perhaps, those authors have tried to avoid the appearance of being "too prescriptive." For example, Hayes and Wheelwright (1984) cover different aspects of manufacturing management with special emphasis on the *structural* elements (e.g., plants, processes, technology) which are important for companies seeking to improve their competitiveness. Although rich in insights, and significantly broad-based in terms of categorizations and examples for managers, however, their work did not provide a structured, step-by-step approach to developing a coherent manufacturing strategy. In their subsequent work, Hayes et al. (1988) discussed the *infrastructural* aspects of manufacturing, including management policies, systems, and practices. This work, too, failed to furnish a structured set of steps to follow when tackling the formulation of an operations strategy.

In one of the more prescriptive studies, Fine and Hax (1985) provided "a conceptual framework and a set of pragmatic guidelines" for designing a manufacturing strategy, and illustrated the application of their approach through a case study. As they suggest, the steps provide a "followable" set of guidelines, most of which appear to be similar to Skinner's. They also integrate many ideas from Hayes and Wheelwright's work. Following a similar scheme, Platts and Gregory (1990; 1992) took the "manufacturing audit" approach and suggested a step-by-step, worksheet-driven model to operationalize earlier strategy frameworks in a usable format for practitioners. Their approach was expanded by Mills et al. (1996) to span the entire process of generating a business strategy for manufacturing companies. Presented in a workbook format, it included step-by-step instructions on how to formulate a detailed manufacturing strategy with the help of ready-to-use forms. More recently, Quezada et al. (1999) applied their "years of experience in strategic management" to 15 small and medium-sized Chilean manufacturing companies, although their process focused on the development of an entire business strategy. Miltenburg's work (1996) has been by far the most prescriptive. His book provides a structured, step-by-step, worksheet-driven process to develop a comprehensive strategy. The model incorporates the works of Skinner, Hayes and Wheelwright (product-process matrix), and Hill, in a single, though complex—and somewhat cumbersome—worksheet.

In his influential work, Hill (1983a, 1993, 1994) presented a unique five-step process to develop a manufacturing strategy (Table-2.1). This process provides a formal method for the establishment of a manufacturing-marketing interface, and emphasizes the need to link both (manufacturing and marketing) perspectives in determining the best overall strategies for the firm. According to Hill, this approach is intended to achieve three objectives: (1) close the gap between manufacturing and marketing in terms of corporate strategy formulation, (2) provide a set of principles and concepts which are pragmatic in nature and could be applied to each different part of a business, and (3) offer an analytical approach to the development of manufacturing strategy rather than advocating a set of prescriptive solutions (Hill, 1994: vi). Although the framework in Table-2.1 illustrates a unidirectional sequence of activities flowing from the establishment of the corporate and marketing strategies, through identification of order-winners, and to manufacturing structural and infrastructural decisions, the model is intended to stimulate a bi-directional debate.

Central to Hill's model is the determination of *qualifying* and *order-winning criteria* for the firm's products. Hill defines order-winners as the characteristics which enable a company's products to win more orders (increase sales) in the markets in which they compete. Qualifiers are somewhat different in that they enable companies to get into and stay in specific markets; but emphasizing those capabilities would not win more orders. They can be seen as "the price of entry," or, "minimum requirements to be met" in subject markets. Companies, Hill argues, must work on both sets of criteria, but in different ways. (Hill, 1994)

Although the concept of order-winning criteria appears to be similar to many other researchers' representation of "means of competing"[4] for manufacturing firms, it differs from them in subtle ways. Since this concept, and specifically Hill's terminology, forms the basis of this research, it deserves further attention, and will be discussed in more detail in the following sections.

### 2.1.1. Means of Competing

The set of priorities which enable companies to compete in the marketplace has been named in the literature in different ways. A representative list of these terms and their primary references are provided below.

- "competitor success requirements" (Fine and Hax, 1985);
- "competitive success factors" (Hayes and Wheelwright, 1984);
- "competitive criteria" (Platts and Gregory, 1990, 1992);
- "competitive priorities" (Wheelwright, 1978, 1984);
- "competitive variables" (Marucheck *et al.* 1990);
- "competitive capabilities" (Miller and Roth, 1994);
- "manufacturing capabilities" (Ferdows and DeMeyer, 1990);
- "production competence" (Cleveland *et al.*, 1989);
- "manufacturing task" (Skinner, 1969);
- "market demands" (Skinner, 1985);
- "market requirements" (Platts and Gregory, 1990);
- "qualifying/order-winning criteria" (Hill, 1994).

Although some authors seem to prefer one term over the others, many use multiple terms, such as, "competitive priorities," "manufacturing priorities," and "manufacturing task," interchangeably in a single article (see, for example, Wheelwright, 1984; Swink and Way, 1995; Kim and Arnold, 1996). Nevertheless, with the exception of "order-winning criteria," there is a general agreement that by and large they all mean the same thing. The only differentiation appears to be between "capabilities" and "priorities." Kim and Arnold's (1996) definition provides a good summary:

> *"Competitive capabilities represent an holistic set of tasks which should be performed by the manufacturing function in order to support the business strategy. The degree of relative emphasis given to each of them represents manufacturing's competitive priorities." (p.54)*

Here we encounter the first differentiator among the commonly used terms, i.e., whether the set of criteria are *ranked* in relative importance. Surprisingly, majority of researchers did not deliberately seek to have respondents prioritize those variables at the firm or plant level. Richardson et al. (1985) observed that the CEOs of the companies they studied exhibited low levels of discrimination among

[4] The term "means of competing" has been coined by this author only to make generalized references to the different terminology used by other authors.

the importance of factors in the manufacturing task. In some cases, they observed, all of the manufacturing task variables presented to them were ranked as "very important."

Survey-based studies typically ask the respondents to individually rate the emphasis the firm places on each of a set of generic capabilities using a five- or seven-point Likert scale. Although this allows researchers to use statistical techniques to determine the relative rating of those criteria in cross-sectional studies, individual firms may choose to rate all variables as, for example, "important." Hill's use of order-winners explicitly requires participants to allocate a total of 100 points among the criteria, thus ensuring greater discrimination.

The second differentiator between the concept of order-winning criteria and the terms used by other researchers is what this author calls their "orientation." Whereas order-winning criteria, by implication, are market- or product-based (in a way, outward-looking), most others are either capability-based, and inward-looking, or their externality is not as explicit. A well known example is the difference between the criteria "price" and "cost." Price is market-based and is the criterion that is visible to the customer, whereas cost is a factor that is important to the firm as one of the means to deliver competitive price. Menda and Dilts (1997) used the terms "market-oriented, externally-present" for the former, and, " operations-oriented, internally-derived" for the latter, to highlight the same distinction. This conceptual difference is important in this study, therefore it will be discussed in more detail later.

The third element of distinction between qualifiers/order-winners and other terms which describe the means of competing is whether those criteria are based on the *primary* product line of the company or on *each* of the firm's markets/product lines. With few exceptions (Fine and Hax, 1985; Berry, et al., 1991; Platts and Gregory, 1992), most published research focuses on means of competing at business unit or plant level, without requiring respondents to consider the company's entire range of products/markets. The following question, taken from the 1994 Manufacturing Futures Survey exemplifies the nature of the inquiry:

> *"In order to support effectively the goals and objectives of the business unit strategy, the manufacturing function has to prioritize its competitive capabilities. On the left-hand scale, circle the number [on the seven-point Likert scale] that indicates the importance of each priority for your business unit to compete in the marketplace over the next five years..."*

Hill's (1993, 1994) model, as well as the three exceptions mentioned above, examine the means of competing for all the product lines of the subject company. This distinction, too, is an important element of the research propositions and study design, as will be shown later.

### 2.1.2. The Use of Means of Competing to Link Manufacturing Strategy to Business Strategy

Earliest writings about "defining the manufacturing task" as a way to provide the essential link between manufacturing and business strategies can be traced back to Skinner (1969, 1974) and Wheelwright (1978). Since many of those basic manufacturing priorities involve trade-offs, and a manufacturing plant cannot be equally effective in all measures of performance, the authors asserted, companies should only emphasize one or very few manufacturing tasks derived from the firm's business strategy. According to this logic, only then can companies have coherent manufacturing strategies, and support those few competitive factors exceptionally well. This line of thinking dominated manufacturing strategy research in the years that followed. Recently, however, this "trade-off" model, as it came to be known, has been challenged by Ferdows and DeMeyer (1990) who claimed that those manufacturing priorities can be built one upon the other if companies improve them in a specific order, i.e., quality, dependability, flexibility, and cost. The authors named it "the sand cone model," signifying the mutually supportive (i.e., stackable) nature of the priorities.

While the debate about the validity of these two models continues, research on the presence and the effectiveness of the link between manufacturing and business strategies is still evolving. For example, Schroeder et al. (1986) point out that in their questionnaire-based study of thirty-nine companies they were able to find a good match between those firms' manufacturing and business strategies. Marucheck *et. al.* (1990) observed that all participants in their study addressed the typical competitive variables of cost, quality, delivery, and flexibility during the development of their manufacturing objectives. Notably, however, not all companies rank-ordered those variables; and none used them as the means to link their manufacturing and marketing strategies. Berry, *et al.* (1991) used cluster analysis on a large number of products with different sets of order-winners, and grouped them into segments with different manufacturing implications. Kim and Arnold (1996) examined the pairs of linkages among three important constructs in manufacturing strategy: competitive priorities, manufacturing objectives, and action programs (in this hierarchical order).

Hill places high emphasis on the determination of order-winning/qualifying criteria as a distinct step in the manufacturing strategy formulation process by positioning it as the key link between marketing and manufacturing strategies (table-2.1). The important manufacturing process (e.g., choice of technology; plant size, capacity, and location; process configuration) and infrastructure (e.g., support functions; quality assurance; organizational structure) decisions cannot be made in a coherent manner, he states, unless this key link is established and well understood both by marketing and manufacturing managers in the company. (Hill, 1983a: 1993; 1994)

| Corporate Objectives | Marketing Strategy | How Do Products Win Orders in the Marketplace? | Manufacturing Strategy: Process Choice | Manufacturing Strategy: Infrastructure |
|---|---|---|---|---|
| Growth | Product Markets and Segments | Price | Choice of Alternative Processes | Function Support |
| Survival | Range | Quality | Trade-off Embodied in the Process Choice | Manufacturing Planning and Control Systems |
| Return on Investment | Mix | Delivery Speed and Reliability | Capacity Size, Timing, Location | Quality Assurance |
| Other Financial Measures | Volumes | Demand Increases | Role of Inventory | Manufacturing-Systems Engineering |
| | Standardization vs. Customization | Product Range | | Clerical Procedures |
| | Level of Innovation | Design Leadership | | Payment Systems |
| | Leader vs. Follower Alternatives | Technical Support | | Work Structuring |
| | | Meeting Launch Dates | | Worker Skill Levels |
| | | Existing Supplier Status | | Organizational Structure |

**Table-2.1 Linking manufacturing with corporate marketing decisions. Five steps in formulating a manufacturing strategy, taken from Hill (1994).**

In spite of this degree of attention on means of competing as a key concept in manufacturing strategy literature, no detailed work has been published on how managers can go about determining those factors that are important for their firms.

## 2.2. Gaps in Prior Research and Justification for the Study

The main shortcomings of published literature in production and operations management (POM) strategy, which form the basic justification for this research, are examined in the following sections.

### 2.2.1. Lack of Relevance

This study addresses primarily the *process* aspect of manufacturing strategy formulation using a plant-based methodology. The primary impetus for this is rooted in numerous researchers' call for more process research (Leong et al., 1990; Platts and Gregory, 1992; Swink and Way, 1995; Voss and Winch, 1996; Bozarth and McDermott, 1998), the need for better dissemination of practical applications of strategy development (Swink and Way, 1995), and a need for higher levels of adoption of manufacturing strategy techniques in the industry. (Skinner, 1992; 1996) In fact Skinner goes so far as to suggest that academics should offer specific help to manufacturing managers in the form of "menus" to guide them in their decision making, and provide them with 'how-to's in implementing the latest thinking in the field. Leong et al.'s (1990) assertion that researchers' "goal should be a more rigorous pursuit of the real problems found in practice" is also echoed by others who have been emphasizing the need for managerial relevance. (Hill, 1987; Meredith, 1993; Hill et al., 1995) Since POM is an applied field, one would expect that majority of research would target the unstructured, real life problems operations managers face in the plants. The indication is that this is not the case today.

### 2.2.2. Methodological Gaps

The call from an increasing number of academics for more plant-based research does not seem to be receiving a lot of attention. (Schroeder et al., 1986; Flynn et al., 1990; Hill et al., 1995; Safizadeh et al., 1996) Theory development has also been weak in the field of POM. Flynn et al. (1990), and McCutcheon and Meredith (1993) assert that many areas of POM lack an established base of theory and measurement methods. Leong et al. (1990) share that view by stating that most contribution to

the field have been conceptual and not sufficiently grounded in theory or data. Furthermore, of the limited number of theories which exist, few are based on empirical work; most seem to be "postulated quantitative models." (Meredith, 1993: 10) This is consistent with Swamidass' (1991) finding that majority of research in POM are still based on quantitative modeling, simulation, and similar techniques. Similarly, Wacker's (1998) work on the state of theory-building methodologies in operations management found that of the 2002 POM articles published in top eight academic and practitioner journals in OM between 1991 and 1995, 55% were "analytical mathematical," and only 19% were classified as empirical.

One reason for the lack of broadly-based empirical work, according to Leong et al. (1990), is that manufacturers typically do not want to share sensitive data with researchers. However, the solution to this should not be seen as more empirical work of *any* kind. As Platts (1993) states, many researchers prefer to use "safe" methods, such as surveys, in their empirical studies. In fact, Speier and Swink's (1995) review of empirical manufacturing strategy articles published in the past 20 years found that over 50 percent used surveys as the sole data collection method. Surveys, by their very nature, seek to obtain statistically meaningful and generalizable results, naturally leading researchers to target as high a sample size as possible. This type of generalizations may help them spot overall trends in a segment or groups of industries, but they fail to provide any usable tools for practicing managers. The field, then, would greatly benefit from new empirical research that is plant-based, in-depth, and aimed at theory development.

### 2.2.3. Sources of Data

Two main, and related, issues in the literature regarding data sources are *number of respondents* in the study, and *self report bias.* Due to their interconnectedness, this section examines those aspects together.

A common approach to the solicitation of responses from the companies being studied in manufacturing strategy, as in other POM, research is to survey or interview a single participant from each firm. Speier and Swink's (1995) research found that approximately 80 percent of the studies on manufacturing strategy used a single data source. Malhotra and Grover (1998) had similar results. In their multi-attribute evaluation of 25 survey-based articles published in four top POM journals between 1990 and 1995, they found that only six of them (24%) used any form of triangulation. This reliance on single-respondent studies, particularly in researching manufacturing-marketing/business links,

creates two major difficulties. One is that managers from different functional areas, such as manufacturing, marketing, or finance, may have significantly differing views on their firms' means of competing, and particularly on how those priorities should be addressed by manufacturing. Furthermore, survey-based studies which target operations executives alone tend to rely solely on those individuals' perceptions, but not necessarily on the firms' actual practices[5], i.e., no *data triangulation* is attempted. The second issue is that when a single respondent is asked to state the firm's business and manufacturing strategy in the same survey, there may be a tendency to provide answers that are consistent with each other (self-report bias). One cannot, therefore, conclude that a calculated correlation does in fact confirm the presence of a "good link" between those two strategies, as several studies have done.

For example, Neely et al. (1994) examined the link between the order-winners emphasized by 112 small and medium-sized UK manufacturing firms and the performance measures they used, through a survey mailed to a director at each company. The authors found support for a link between the order-winners and performance measures in companies competing on *time* (delivery) or *quality,* but not in those competing on *price*. Several reasons are offered to help explain this phenomenon, including the possibility of questionnaire bias (which was ultimately ruled out), but no reference is made to the possibility of *respondent bias*—tendency of subjects, in this case, to seek consistency in their responses to questions perceived as related.

Schroeder et al. (1986) point out that in their questionnaire-based study of thirty-nine companies they were able to find a good match between those firms' manufacturing and business strategies. However, they do acknowledge the presence of bias on the part of the respondents, and recognize that they may simply be reporting on the perceptions of those managers. Miller and Roth (1994) also recognize the limitation of using one respondent for all the data gathered in cross-sectional studies. Nevertheless, they see this as a reasonable price to pay in order to collect sufficient data from a large number of organizations. However, if conclusions drawn from these studies are questionable because validity of the responses is suspect, then the price may be too high.

Interestingly, the call for more frequent use of multiple sources of information in strategy research came from Snow and Hambrick as early as 1980. In their study addressing "the major

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[5] This distinction between perceptions and actual practices was first made by Mintzberg (1978). He named the former the "intended" and the latter "emergent" strategy. However, since his work addresses corporate strategy rather than manufacturing strategy, this study does not use his categorization.

theoretical and methodological problems encountered in attempts to arrive at *valid* and *reliable* measures of organizational strategy," they conclude: "reliance on a single data source will almost certainly yield a limited view of the organization's current basis for competing." (Snow and Hambrick, 1980: 537) Somehow this call went unheeded in the POM field until recently when this prevalent practice started receiving some open criticism. (Swink and Way, 1995; Speier and Swink, 1995; Bates et al., 1995; Gupta and Somers, 1996; Boyer and Verma, 1999)

The literature in this field now seems to be at a transition stage during which majority of survey researchers still use a single respondent but at the same time acknowledge its limitations. (for example, Richardson et al., 1985; Gupta and Somers, 1996) In fact the latter goes as far as acknowledging the "propensity of single respondents to seek out consistency in their responses..." Ward et al. (1998), in their mail survey of 114 companies, used a shortened version of the original questionnaire on a second executive in 27 of the responding companies to determine inter-rater reliability for the four generic constructs being measured. The calculated inter-rater agreement coefficients ranged between 0.84 to 0.94 depending on the construct (1.00 being a perfect interchangeability between pairs of responses, and 0.00 being completely random responses), which were considered to be high level of agreement.

Only a small number of empirical studies in which the use of multiple respondents was central to data collection have started to appear in the literature during the last few years. For example, Bates et al. (1995) surveyed 822 respondents (managers and workers) in 41 plants to study the relationship between manufacturing strategy and organizational culture. Managers and workers received different sets of manufacturing strategy questions based on their relevant areas of expertise, and their responses were aggregated (at plant level) to measure the degree to which each plant's manufacturing strategy was aligned with its business strategy and implemented in the plant. The questionnaire did not include questions on the firms' means of competing. Voss and Winch (1996) and Boyer and McDermott (1999), on the other hand, asked their respondents how their plants competed in the marketplace. The former focused on differentiating between manufacturing-based and engineering-based criteria through interviews with 79 managers and engineers in 15 companies, but did not demonstrate the differences, if any, among the managers' responses. The latter study had the purpose of measuring the degree of agreement on the four generic competitive priorities between the organizational levels (managers and operators) in each of the seven companies studied. With the exception of Menda and Dilts (1997), none of those studies demonstrated the degree of

disagreement among functional managers (high level managers with considerable influence on their firms' manufacturing strategy).

### 2.2.4. Gaps in the Way in Which the Concept of Means of Competing is Used

References in the literature to these strategy content variables reveal the evolving nature of the concept. The main gaps which are relevant to this study can be boiled down to three main tendencies in most research: (1) the use of only four to six generic, conceptually aggregated criteria, (2) to base those variables on the overall business, and (3) to use a mix of internal and external criteria. These are addressed in this section.

#### 2.2.4.1. Generic versus Specific Criteria

Most of the published studies dealing with means of competing have used the four generic capabilities of *cost, quality, flexibility*, and *delivery* (also expressed as *dependability* or *time*). (Swink and Way, 1995) *Service* and *innovation* have also been used more recently as the fifth, and sixth generic criteria to capture emerging trends. Many authors state that these generic capabilities are the ones most frequently cited by the manufacturing executives participating in studies. The question is: do the practicing managers name those criteria themselves, or, do the researchers present the respondents with only those choices, or are the respondents asked to rate a larger set of capabilities which are then grouped into four to six generic categories by the researchers? Examination of literature reveals that although all three situations occur, the latter two are most common. Earlier studies tended to use the four generic capabilities up front, whereas the more recent ones start with a larger set which, at the data analysis stage, are grouped into a smaller set of more generic terms.

Perhaps the most widely used database for POM research is the Manufacturing Futures Survey (MFS), which has been improved over the years to incorporate the emerging trends and concepts in the field of POM. One of those improvements is the number of competitive criteria included in the questionnaire to examine the manufacturing strategies of the participating firms. In 1987 respondents were asked to rate 11 criteria; in 1990 and 1992 the number was 15; and 1994 and 1996 surveys had 16 variables, all grouped into the five generic capabilities for analysis. Other examples include Neely et al. (1994) who used eight order-winners grouped into four; Noble (1997) who started with 16, and later grouped them into six; and Vickery et al. (1997) who aggregated 10 manufacturing competitive priorities into four, using factor analysis.

Categorizations, and the resulting generalizations of this kind obviously achieve a statistical "cleanliness," and help researchers interpret the large amount of data collected in cross-sectional surveys. The downside of this focus on statistical generalizability of the results, however, may be that a good deal of detail and specificity at the firm or plant level is being sacrificed (Hill, 1994), reducing the likelihood that the findings of this kind of research would be useful for practicing managers.

2.2.4.2. Criteria Based on Business Unit or Plant versus Multiple Markets

The other issue related to the use of means of competing in manufacturing strategy research has to do with their propensity to be based on the entire business unit or manufacturing plant. As markets become increasingly fragmented, companies are naturally seeking to increase their sales volume by not only growing their existing businesses, but also by entering new markets and discovering new sub-segments of the markets in which they compete. This, invariably, introduces a level of diversity to the firms' basis of competition which would need to be made explicit, rather than "averaged out" for statistical purposes. Interestingly, with the exception of Fine and Hax (1985), Berry et al. (1991), Platts and Gregory (1992), and Menda and Dilts (1997), most published literature focuses either on the business unit/plant overall, or the firm's primary product line, overlooking the real life complexity most manufacturing managers face in dealing with the variety of markets and product lines.

2.2.4.3. Internal versus External Criteria

The third tendency in most published research is their non-discrimination between criteria that are internal and capability-based, and those that are external and market or customer-based. As pointed out in section 2.1.1, priorities such as price, delivery speed, and product performance are factors as they are viewed from the outside, whereas measures such as cost, manufacturing throughput time, and several forms of flexibility are internal to the firm and are capability-based. Most studies use different combinations of these internal and external criteria indiscriminately. However, for the manufacturing function to more clearly define its strategic response to the market demands, finer distinctions among the criteria need to be made rather than attempting broader conceptual aggregations.

Finally, as Swink and Way (1995: 6) also state: "the assessment of [the] priorities [for competitive criteria] in real life settings has proven problematic." Although the authors do not

support that claim in their paper, review of the literature reveals the validity of the statement. While there is only a shortage of manufacturing strategy process research in general, published detailed studies on the way in which means of competing can be assessed by practitioners are almost non-existent.[6]

### 2.2.5. Distinction Between Qualifying and Order-Winning Criteria

Earlier in this chapter it was argued that Hill's concept of order-winning criteria is different from the other expressions of means of competing found in the literature (section 2.1.1). One important characteristic that distinguishes Hill's approach from the rest is his differentiation between market *qualifiers* and order-*winners*. (Hill, 1994) Whereas qualifiers allow companies to enter and stay in their markets, order-winners enable them to differentiate themselves from competitors. According to Hill, qualifiers should be supported at average market levels because improving them would not result in increased sales. Achievement of superior performance on the order-winners, on the other hand, is necessary in order to win more orders and get new customers.

Since Hill coined these terms and articulated the distinction between the two, with very few exceptions (e.g., Berry et al., 1991), no other research exploring this nuance has appeared in the literature. Spring and Boaden (1997: 771), in their conceptual critique of Hill's framework and particularly of the concept of qualifying/order-winning criteria, argue that "much of the work [in identifying those factors] is disappointing." Nevertheless, the approach has significant intuitive appeal, therefore merits attention.

## 2.3. Development of The Research Propositions and the Process Model

This study was grounded in many aspects of prior research and sought to fill several of those gaps pointed out above. The specific aspects of the literature discussed earlier in this chapter and the approach taken in this study to address the main gaps are summarized in table-2.2.

[6] Here the reference is to research published in refereed journals; otherwise, the mechanics of formulating a manufacturing strategy, although rare, can be found in textbook and workbook formats (e.g., Hill, 1994; Miltenburg, 1995; and Mills, 1996).

| ELEMENTS OF POM PROCESS RESEARCH | HOW THIS STUDY ADDRESSES THE MAIN GAPS IDENTIFIED |
|---|---|
| **Relevance** | The study sought to answer a "how to" question relevant to practicing managers in manufacturing through in-depth analysis conducted in real-life organizational settings. The process steps examined and the insights gained can be directly applied in industry. |
| ***Methodology*** | A plant-based, multiple-case, action research methodology was followed, using a variety of data collection techniques, including interviewing, participant-observation, and documentation. |
| ***Data Sources*** | Extensive data triangulation was undertaken through the use of multiple respondents in each case, as well as data obtained from other sources such as company records and market data. |
| ***Number of Criteria Used*** | A set of varying number of criteria (rather than a fixed set of generic constructs), unique to each case, was derived from a comprehensive master list, and used as the starting point in each structured interview with participants. The set was also supplemented with participant-generated criteria at different stages of the study. |
| ***Orientation of Criteria*** | All criteria were expressed in market-related terms, i.e., in the way they would be "visible" to the customer or end-user, rather than as a combination of market criteria and manufacturing capabilities. |
| ***Basis for the Criteria*** | Order-winners and qualifiers were determined for each one of the company's markets (or product lines, or groups of customers, depending on the case) instead of solely for the primary product line. |
| ***Prioritization of Criteria*** | Assignment of importance was accomplished by distributing 100 points among the order-winners for each market. |
| ***Qualifiers versus Order-Winners*** | The distinction between the two concepts was made explicit. The qualifiers were denoted by a "Q" (or by "QQ" signifying its order-losing-sensitive nature) without being assigned any weights, as suggested by Hill (1994). |

**Table-2.2 Summary of Various Elements of Prior Research and the Corresponding Aspects of This Study**

### 2.3.1. Research Propositions

The main objective of the research was to answer the following basic question:

> ***"How do the managers of a manufacturing company go about establishing the qualifying and order-winning criteria for their products?"***

Based on the examination of literature, and the main gaps identified and summarized above, the following research propositions were developed and tested in this study:

**P1 -** Managers from different functions in a company may have differing perspectives on the way in which their firm qualifies and wins orders in the marketplace. Therefore the step of identifying those factors should involve the solicitation of each key manager's views individually.

**P2 -** Once the views of key functional managers on the firm's qualifiers and order-winners have been individually recorded, and if found to differ from each other, the differences should be resolved through consensus in a group setting.

**P3 -** Using the traditional four generic criteria (cost, quality, flexibility, delivery), as commonplace in existing literature, is not sufficient to capture the uniqueness of each company's situation. A more comprehensive list of factors is necessary to provide participants with a wide range of choice and discriminating power.

**P4 -** The use of criteria which are expressed in market-related terms focuses attention on external factors (instead of internal capabilities), thus providing clarity and consistency for participants.

**P5 -** Basing the qualifiers and order-winners on each of the company's markets/product-lines exposes the diversity of demands firms face, and ensures that the companies' entire span of markets/customers is explicitly taken into account.

**P6** - Differentiating between qualifying and order-winning criteria when assessing each product/market segment provides managers conceptual clarity and allows them to adequately prioritize the criteria.

The general framework defined by Hill (1994) was used as the starting point on which additions, expansions and refinements were made. Specifically, the focus of the study was step-3 of Hill's five-step process model (table-2.1). Some elements of steps 1 and 2 were used mainly for data triangulation. The last two steps (4 and 5), which deal with the structural and infrastructural decisions related to the establishment of the manufacturing strategy, were left out of the scope of this study.

### 2.3.2. The Process Model

The simplified process model used in this study is shown below.

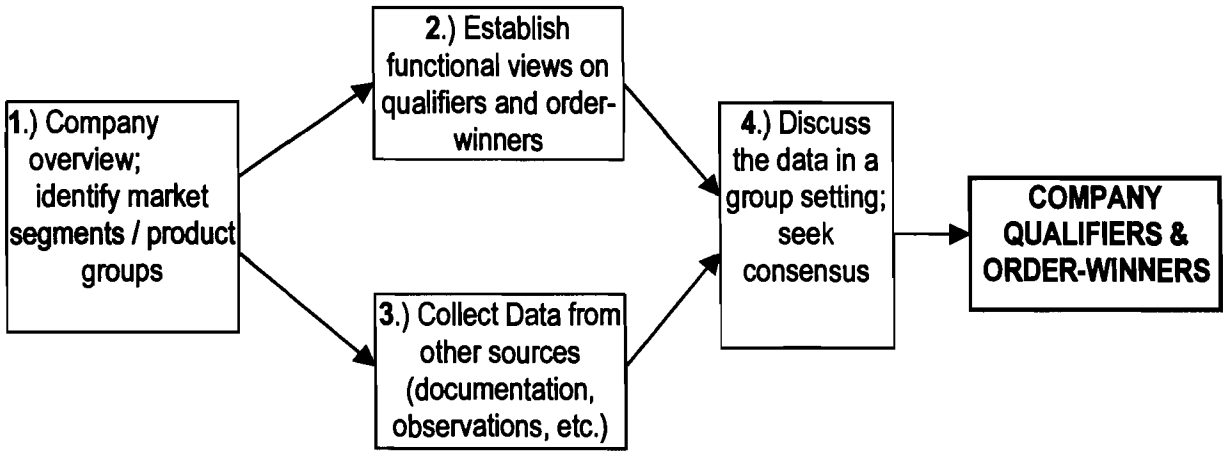


**Figure-2.1 Proposed Process Model**

Step-1 involved the gathering of information on the overall company, its products, primary processes, organization, etc. Point of entry typically was owner, general manager, or vice president of operations. A preliminary segmentation of markets or products, and selection of participants were also achieved in this step.

Step-2 covered the set of activities related to the identification of the qualifying and order-winning criteria through one-on-one interviews with multiple participants (as the first step in data

triangulation). The participants typically were functional managers (e.g., production manager, marketing or brand manager, engineering manager, etc.) responsible for key processes in their firms.

Data triangulation was significantly enhanced in step-3, by supplementing multiple participant views with examination of company documents, production records, historical and forecast data, as well as additional unstructured interviews and shop-floor observations.

Step-4 was performed in a group setting, in which all participants were presented with a summary of individual views on order-winners/qualifiers, as well as with relevant data collected through other means in step-3. A debate was facilitated by the researcher with the objective of reaching a consensus. The outcome of the group meeting was a single table showing the qualifiers and the weighted order-winners for each of the company's market segments, product groups, or customers.

More detail on the individual steps is provided in the field procedure in section 3.5.

### 2.3.3. Master List of Criteria

Extensive literature review revealed a comprehensive list of most commonly used means of competing. The list was parsed into a smaller set (referred to in this study as the "master list") by putting them through two filters: (1) those with external orientation, i.e., market- or customer-based (e.g., price was used instead of cost), and (2) eliminating identical terms (e.g., delivery reliability was used instead of delivery dependability). This set was used as the candidate list of qualifying/order-winning criteria at the start of each case. A company-specific subset of eight to 12 criteria was selected, by the primary contact person at each firm and the researcher, based on their applicability to the firm. The subset was then used during each individual interview with the functional managers who participated in the study. Latitude was given to the participants to modify/delete the criteria presented, and add new ones as they saw fit. Those changes are discussed in the case descriptions in chapter 4. The master list of criteria is shown below.

- Price
- Conformance quality
- Delivery speed
- Delivery reliability
- Broad product range
- Design customization
- Product reliability
- Product innovation
- Product performance
- After-sales service
- Broad distribution
- Brand image
- Design quality
- Company reputation
- New product time to market
- Product availability
- Advertising/promotion
- High-performance design
- Existing supplier
- Technical support
- Product features
- Package design
- Environmental leadership
- Promotional pricing
- Trade relations
- Volume flexibility
- Demand fluctuation flexibility

A definition for each criterion has been provided in appendix-III.

# Chapter 3. RESEARCH METHODOLOGY

This chapter first outlines various research designs available to business researchers, and expands on the specific type (case study/action research) chosen in this study. It continues with the justification for the selected research design, explains the data collection, unit of analysis, and sampling methods, and finally outlines the basic protocol followed at each site.

## 3.1. ALTERNATIVES FOR RESEARCH DESIGN

Among the range of research design strategies that can be used in organizational and management studies, five are most important. (Yin, 1989)

- **Experiment** – involves assigning subjects at random to either an experimental or a control group. Conditions for the former are manipulated by the researcher to observe the effect of the variable(s), and compared to the control group, the members of which were not subjected to any varying conditions.
- **Survey** – attempts to obtain information from, or about, a defined set of subjects (people, organizations, etc.), which are considered a "population," primarily through questionnaires or interviews. In small populations, all members are surveyed, whereas when the population is large, a sub-set that is fully representative, or a "sample," is contacted. When survey structure and sample size are adequate, this allows statistical inference of the results or conclusions.
- **Archival analysis** – relies on extensive review of archival records typically to describe the incidence or prevalence of a phenomenon, or when the research is expected to be predictive about certain outcomes.
- **History** – targets to interpret the present and the future by gaining insights into the organization's history, and examining the processes that have led up to the company's present condition.
- **Case study** – places high emphasis on a full contextual analysis of a small group of real-life, contemporary events or conditions and their interrelations. By using multiple sources of evidence, it relies on high level of detail in providing valuable insights for problem solving, evaluation and strategy.

archival analysis, as in economic studies, can be complemented by a survey of the experts in attempting to predict the likelihood of a certain outcome. Similarly, a case study using interviews and direct observation may provide richness to a historical analysis. In spite of these synergies, however, each strategy also has its unique characteristics that may rule out specific designs in certain situations. The goal, therefore, is to avoid gross mismatches when selecting design strategies for specific research questions.

The type of the research question addressed in this study (i.e., "how...", see section 2.3.1.), the need to examine this question (a contemporary event) in a real-life setting, and the importance of including the context (the organization) in the phenomenon being studied, all point to the use of case study and its special form, action research. The justification for the selection of these research strategies is covered in detail in section 3.4. The following two sections describe the important characteristics of the two methodologies.

### 3.2. Case Study

The case study has not received significant attention in traditional research methods literature; in fact, according to Yin (1989: 10), "[it] has long been stereotyped as a weak sibling among social science methods." The following assertion by McKinney (1954) exemplifies a more radical view some thirty years earlier: "It is doubtful that the study of cases should be called a method at all." McKinney described case study as merely "... a way of ordering social data with the view of preserving the unitary character of whatever is being studied." (McKinney, 1954: 187) In the following years case study was treated as a transitory research strategy, or at best, a sub-category several levels below any traditional research strategy. For example, Simon (1969) stated that case studies are synonymous with the *descriptive* type of research. He considered it the method of choice when the researcher wants to obtain a *wealth of detail* about the subject. Its use is appropriate, he claimed, when one is trying to find clues and ideas for further research. Similarly, Dane (1990) considered hypothesis generation as probably the most common purpose of case studies. However, he also classified it as one of the three types of single-participant design (the other two types are baseline, and withdrawal designs). In his definition, case studies involve intensive study of a single participant over an extended period of time.

Modern views of case study as a research strategy have been more broad-based and more receptive to its use in the POM field. (for example, see Yin, 1989; Hill, Nicholson, and Westbrook, 1995; Leonard-Barton, 1990; Meredith *et al.*, 1989; Gummesson, 1991) Those researchers see case study not only as a suitable strategy for exploratory, descriptive, and explanatory phases of an investigation, but also as appropriate for theory building. (see also Eisenhardt, 1989; McCutcheon and Meredith, 1993; Meredith, 1998)

According to Yin (1989), case study as a research strategy has been receiving increasing acceptance in the academic community as evidenced by its increased use in social investigations, evaluation research, public policy studies, and business, management and international studies. One important shift in favor of case studies has been its increased use as a research tool, rather than just a teaching tool in business schools. Another endorsement came from the Journal of Operations Management in its January,1990, issue. The editors felt the need to publicly announce the journal's "...receptiveness to papers that utilize empirical/field-based methodologies in operations management research." (Evert, 1990) They acknowledged the fact that the "realities of operations management" have forced the editors to accept nontraditional methods for addressing issues that cannot otherwise be reached. Case study, as a research tool, is in a unique position to fulfill this role since "...[it] allows an investigation to retain the holistic and meaningful characteristics of real-life events—such as organizational and managerial processes,..." (Gummesson, 1991: 76) In a sense, business case study research can be likened to medical case studies which heavily rely on in-depth analyses of the subject and on being close to the data. In other words, both "can touch its reality." (Hill et al., 1995)

In terms of understanding case studies and differentiating them from the other research strategies, Yin points out three important characteristics. The first is that the case study is an empirical inquiry that investigates a *contemporary event within its real-life context*. Second, case study is particularly suitable as a research strategy when the *boundaries between phenomenon and context are not clear*. Finally, in case studies, *multiple sources of evidence* (data collection methods) are used. (Yin, 1989) This last point is one of the most frequently cited advantages of the case method (for example: Eisenhardt, 1989; McCutcheon and Meredith, 1993; Leonard-Barton, 1990; Yin, 1989) and is covered in more detail in section 3.4.1.

### 3.3. ACTION RESEARCH

Dane (1990) asserts that another goal (or hierarchical level) should be added to the traditional research goals of exploration, description, prediction, and explanation: *action.* He defines action research as research conducted to solve a social problem, and states that this kind of research adds to the traditional goals the requirement of finding a solution, of doing something. It is through action research, he claims, that we are able to test applications of other research results. Easterby-Smith et al. see the following two notions as important parts of action research projects: (1) the best way of learning about an organization is by attempting to change it, and (2) the people most likely to be affected by, or involved in implementing, the changes should ideally be involved in the research process itself. (Easterby-Smith et al., 1993: 34)

That action research is a variant of case study is widely accepted. Gummesson (1991) takes it one step further and states that it is the most demanding and far-reaching method of doing case studies. Among the primary aims of action research three stand out: (1) contributing to the practical concerns of people, (2) contributing to the goals of social science, and (3) to develop the self-help competencies of people facing problems. (Susman and Evered, 1978) The aspect of contribution to subjects' ability to solve problems is a frequently stated purpose of action research. Studies are typically triggered by an interest in the problems of a particular group, a community, or an organization. The researchers then target to assist people in deepening their understanding of the issue at hand so that they can resolve the problems confronting them. (Stringer, 1996)

This degree of "closeness" to the subjects, however, contrasts with the traditional attributes of positivist research, which portrays the researcher as detached, neutral, independent, and objective. Action research takes advantage of this apparent contradiction and turns it into "a virtue" (Easterby-Smith et al., 1993) by using the researcher as the guide to structure the events or change processes under study, rather than confining his or her role to one of data collector. The action researcher, in his role as a facilitator, becomes the catalyst in involving the participants in the process and observes them make the decisions and reach the conclusions on their own. Among other roles most frequently attributed to action researchers are: "importer of new knowledge" (Easterby-Smith et al., 1993), "actor" (Platts, 1993), and "resource person." (Stringer, 1996)

The active role action researchers take in the process they study can also be seen as a feature that brings action research closer to experiments. There certainly are aspects of experiments in studies employing action research methodology. An important one is the fact that action researchers

introduce a change to the subject being studied and observe the impact of this change on the subject. This is similar to the condition(s) manipulated by experimenters who observe the effect of that variable(s) on the experimental group. Another similarity is the action researcher's level of participation in the events, which exceeds that of a case researcher's (covered in more detail in section 3.4.1). He or she shapes the relevant behaviors of the participants and the events, and exercises a level of control on their environment (the context—the organization) within which the change process takes place.

However, the similarities may end there. Whereas typical experiments involve a control group (set of subjects not exposed to the condition manipulated by the experimenter) alongside the experimental group, a single- or multiple-case action study does not, ordinarily, utilize "control" cases (although their use would be acceptable). Assessing the immediate effect of the manipulated condition on the otherwise controlled subject is not the primary focus of an action study, as it is of experiments. The process itself, and the interaction between the participants and the events, as well as among the participants, typically comprise the main purposes of action research. Another dissimilarity rests with the fact that while experimenters specifically keep all variables other than the one being manipulated constant, action researchers rely on the real life context, analyze its relationship with the events and make this interaction a part of the wider theory they are attempting to develop.

The characteristics of action research stated here have, for a long time, made it most suitable for social sciences (Susman and Evered, 1978; Yin, 1989; Easterby-Smith et al., 1993); however, the technique has also started to permeate other disciplines, such as management information systems. (Benbasat et al., 1987) Its use in POM is particularly appropriate since operations management involves people and groups in organizational settings. As Westbrook (1995) also suggests, if field-based methodologies such as case study and action research have successfully been used in social sciences for so long, applying this experience to POM and generating the depth and richness of information typically associated with those methods would substantially benefit the field.

## 3.4. JUSTIFICATION FOR THE RESEARCH METHODOLOGY CHOSEN

That production and operations management is an applied science, and that it should be based on real-world data is widely accepted. It follows, then, that research conducted in this field should be

of practical value to management practitioners. As Hill *et al.* (1995) state: "Conducting research on-site and investigation through the analysis of relevant data, issues, developments and events ensures relevance and a validity essential to making an impact on business practice." This, coupled with other calls for more plant-based research (Schroeder et al., 1986; Hill, 1987, 1997; Flynn et al., 1990; Safizadeh et al.,1996), and the nature of the problem studied in this research (section 1.2), point to an empirical, field-based methodology.

Among the empirical research methodologies, surveys have been the most widely-used in POM literature. (Speier and Swink, 1995; Hill et al., 1995; Flynn et al., 1990; Westbrook, 1995) Their primary strength is their ability to draw generalizable conclusions across different industries, or other homogenous groups, from statistically meaningful samples. Other reasons the survey method is popular among academics are that it is efficient in terms of research time, it can be carried out by less experienced staff, and lends itself to the application of standard statistical techniques, thus meeting the traditional test of rigor. (Hill et al., 1995) However, their shortcomings have also been well-documented. (Yin, 1989; McCutcheon and Meredith, 1993; Westbrook, 1995; Hill et al., 1995; Collins and Cordon, 1997) The most frequently cited are: self-selection of respondents, respondent bias, need to limit variables, lack of investigation of context, inability to revisit or change prior assumptions, and a tendency to attempt to reach high reliability and internal validity at the expense of external validity. These shortcomings become amplified particularly when surveys are used as the sole technique in the study. (Jick, 1979)

The question being studied in this research is typical of the unstructured problems faced by managers in the reality of organizational settings. As Yin suggests, "how" and "why" questions are likely to favor the use of case studies, experiments, or histories (table- 3.1). The case study is preferred for examining contemporary (rather than historical) events, but when the relevant behaviors cannot be manipulated, the way they can be in experiments. (Yin, 1989) Although this distinction is valid for typical case studies, the very nature of action research, as covered in section 3.3, allows the researcher to influence the participants involved in the change process, thus introducing some degree of manipulation of behaviors. This kind of interference was necessary in this study since the research question involved in-depth investigation of how a particular process would be performed in actual organizational settings (section 2.3.1). This required the researcher's level of participation to be more than the typical case researcher's, i.e., not only participating in the activity, but directly facilitating, and, in the process, educating the participants. These

characteristics pointed to the use of action research as the primary methodology in this study, although many aspects of traditional case studies were also utilized.

An important point that should be made here is that although the researcher controlled the way in which that activity was conducted (i.e., *the process* of determining the qualifiers and order-winners for the firm) he did not influence the outcomes (*the content* of the qualifiers and order-winners). This distinction may appear subtle but it is important in ensuring that the research remains within the accepted principles of conducting action research. It is acceptable for the action researcher to "impose his conceptual frameworks on the tasks and interpret the events within these frameworks" (Platts, 1993), but he should not attempt to impose his opinions and conclusions over those of the company. This principle was carefully adhered to throughout the study. The conceptual framework which formed the basis for this research, as explained in section 2.3.2, was the process through which the participants in each firm were taken and their behaviors interpreted. However, the participants' individual assessments of order-winners, qualifiers, and of market segments, and the subsequent consensus they reached on those parameters (which, in most cases, turned out to be different from any of the individual evaluations) were kept free of researcher's own opinions and conclusions. Evidence of apparent inconsistencies among individual assessments, changes in market segmentation, and significant shifts in the weights of the order-winners during the final group meetings can be found in the individual case descriptions and analysis (chapter 4) and discussion (chapter 5) sections of this report.

One additional, and important, characteristic of action research that particularly suits this study is that action research is fundamentally a *consensual* approach to inquiry and works from the assumption that cooperation and consensus making should be the primary orientation of research activity. (Stringer, 1993) As stated in section 2.2.3, the literature search and the reality of organizational settings point to a potential for divergent views among functional managers on their firms' key strategic issues. The consensus-seeking approach in action research is, therefore, a good fit for this study, as Stringer states: "[action research] seeks to link groups that potentially are in conflict so that they may attain viable, sustainable, and effective solutions to their common problems through dialogue and negotiation." (Stringer, 1993: 19)

### 3.4.1. Data Collection

Although various authors offer different sets of data collection methods for different types of research design (Simon 1969; Emory 1985; Dane 1990; Cooper and Emory, 1995), Yin (1989) outlines six methods (or, *sources of evidence*) specifically suited for case study research:

1. Documentation (letters, proposals, reports, memos)
2. Archival Records (service records, organizational records, diaries)
3. Interviews (open-ended, focused, formal surveys)
4. Direct Observations (formal or casual data collection)
5. Participant Observations (taking part in the events)
6. Physical Artifacts (technological devices, works of art)

Although action research typically uses a smaller subset of these methods (documents, interviews, and participant observation), Stringer (1993) puts the step of gathering of information (i.e., data collection) into a broader context which he terms "building the picture." This phase of the research activity involves the following steps:

1. Interviewing participants
2. Participating in and observing activities and events
3. Reading appropriate documents and records
4. Sorting and assembling information
5. Helping each stakeholder to develop a descriptive account of the issue
6. Formulating a joint descriptive account with combined stakeholder groups

Although all of the sources of evidence described so far are used in field research to varying degrees, direct and participant observation, and interviews (methods 3,4, and 5 from Yin, above), are the key techniques that characterize case and action research, and merit further explanation.

#### 3.4.1.1. Direct and Participant Observation

Dean (1954) differentiated participant observation from surveys as follows: "The hallmark of the survey method is standardized data gathering. A major characteristic of participant observation and interviewing is its non-standardization. It frequently redirects the inquiry on the basis of data coming in from the field work to ever more fruitful areas of investigation." (Dean, 1954: 225)

Junkers' (1960) classification scheme offers four levels of participation by the observer along a continuum of involvement, as follows:

- *Complete observer* is one who observes an event without becoming part of it.
- *Observer-as-participant* is known to the participants as a researcher but does not take an active part in the events.
- *Participant-as-observer* is also known as a researcher but he fully participates in the ongoing activities.
- *Complete participant* is a researcher who fully participates in the events but is not known to the other participants as a researcher.

Easterby-Smith *et al.* (1993), however, caution researchers that this classification may be confusing when put into practice and suggest a scheme more suitable for management or organizational research:

- *Researcher-as-employee* works within the organization, alongside others, and his role may or may not be explicit.
- *Research as explicit role* involves being present everyday over a period of time with entry being negotiated in advance with management and preferably with employees.
- *Interrupted involvement* occurs when the researcher is present sporadically over a period of time, moving in and out of the firm to deal with other work or to study other organizations.
- *Observation alone* (complete observer) differs from the previous types in that the researcher avoids sustained interaction with those under study.

Although this classification appears to be more descriptive in terms of the role of the researcher in an organizational setting, some difficulties remain. For example, being "present" in, say, a large firm, may not provide a precise definition of the actual degree of involvement by the researcher. Depending on the size of the organization and hierarchical level of the participants, researcher's amount of interaction with the staff and involvement in the events may impact the type and amount of access to relevant data. Furthermore, researcher's very presence in the firm may affect the behavior of the participants, and thus the outcome of the investigation. Most of these difficulties were avoided in this study. This researcher was an employee in the largest of the two firms (cases A

and E); therefore opportunities for interaction with managers and access to data sources were ample. In the other three firms, their small size made interaction with the limited number of executives, and access easier. Furthermore, the researcher's extensive industry background in production and engineering management was an important factor in gaining the trust of the participants.

Despite its potential risks, however, participant observation, in its various forms, plays a central role as a data collection technique in case and action research.

3.4.1.2. Interviews

Personal interviews represent one of the data collection modes of "questioning" or "surveying" people (the other modes are telephone interview, and self-administered/mail survey), and are defined as a two-way conversation initiated by an interviewer to obtain information from a respondent. (Cooper and Emory, 1995) Various types of interviews, using different terminology, have been identified by different authors. (Cooper and Emory, 1995; Easterby-Smith, 1993; Gummeson, 1991; Meredith et al., 1989; Yin, 1989) The following provides a composite classification.

*Unstructured* (open-ended) interviews allow the respondents plenty of latitude to talk about a single or a set of topics. The questions are open-ended in nature, and the interviewer encourages the interviewee to share as much information as possible. Although this kind of questioning provides the respondents an unconstrained environment in which to frame the issues themselves, it also runs the risk of becoming lengthy and getting out of context. To avoid these shortcomings the interviewer needs to provide a frame of reference for respondents' answers and limit the length of the interview.

*Semi-structured* (focused) interviews are shorter (one to two hours), and while the majority of the questions may still be open-ended, the interviewer typically follows a case study protocol in deriving the questions. These interviews can still be conducted in a conversational manner in order to provide a relaxed environment, however the researcher is required to guide the topical direction, and encourage discussion and elaboration by the respondent.

*Structured* interviews use closed questions, as in formal surveys, and present the respondents with a fixed set of choices. This type of interviews, while allowing quantitative representation of responses, better cross-case comparisons, and systematic analysis, may fail to capture contextual

information and other valuable data the interviewee may provide through more open-ended questioning.

All three types of interviewing techniques were used in this study, taking advantage of the benefits of each in various situations. The way they were utilized at different stages of the study, and their use as data triangulation tools are summarized in the next section.

3.4.1.3. Data Triangulation

Data triangulation through the use of multiple sources of information is a key principle of case studies and action research, and an important factor in achieving one of the elements of research rigor, *construct validity*. (Jick, 1979; Yin, 1989; Leonard-Barton, 1990; Eisenhardt, 1989; Westbrook, 1994; McCutcheon and Meredith, 1993) Multiple sources enable the researcher to provide more than one measure of the same phenomenon, and address a wider range of behavioral and contextual issues within the case. This aspect was important in this study since the process being investigated relied on the views and knowledge of multiple participants in each company, actual practices by the staff on the production floor, and on the realities of the markets in which the firms were competing. It was expected that discrepancies would exist among the opinions of functional managers, and between each participant's responses and evidence from documentation and observations. (Menda and Dilts, 1997) The use of a combination of data collection techniques made the triangulation possible.

This important strength of case and action research, however, may also be problematic in some cases since it relies on the researchers' level of expertise on several data collection techniques at the same time. (Yin, 1989) Typically researchers in a specific field would prefer, and, over time, master, certain methods better than others; e.g., historians on archival investigation, or psychologists using questionnaires, etc. Utilizing many sources of evidence during a single study requires that the researcher has an understanding of, and an adequate degree of comfort with, each technique and how they should be used for data triangulation. On the other hand, the inherent flexibility of a multiple case study allows the researcher to build on the experiences from the early cases, and modify, add or delete, and improve on each technique as the study progresses. Despite this advantage, Yin (1989) emphasizes the need for the researcher to prepare a detailed study protocol, especially in multiple-case designs, to increase reliability (this aspect is covered in section 3.5).

The data collection stage of this study involved the use of a combination of the techniques described above, and closely paralleled Stringer's (1993) scheme for "building the picture" in action research. A summary listing of types of data sources used in this study is provided below.

1. **Documentation** – examination of company memoranda, minutes of meetings, financial reports, product costing sheets, organizational charts, plant production records, sales history, sales forecasts, market share surveys, long-range plans, and corporate annual reports.
2. **Interviews (developing a descriptive account)** – involved structured, semi-structured, and open-ended interviews with company functional managers as well as some shop-floor employees. A single, formal survey was also filled out during a structured interview with each participant.
3. **Direct Observation** – casual observations were conducted on the production floor, and in meetings.
4. **Participant Observation** – in cases A and E the author was a "researcher-as-employee," which helped minimize the limitation of other types of participant observation in large organizations, as pointed out above. In cases B, C, and D, his role fit both categorizations described above as "participant-as observer" and "interrupted involvement."
5. **Facilitated Group Discussions (formulating a joint descriptive account)** – although they may be considered a special type of interviews, group meetings were used as a key step in reviewing individual accounts of the participants, and in helping them reach a consensus.

Data triangulation in this study was achieved at two levels: first through the solicitation of views of *multiple* functions by collecting qualitative and quantitative data from more than one respondent in each case. Second, this was supplemented with data from *other sources* (e.g., documentation, observations) as well as additional unstructured interviews.

Table 3.2 summarizes the use of each data collection technique during the major stages of the study, and demonstrates the extent of triangulation at each of those stages. The table demonstrates that all of the seven data collection methods listed in the leftmost column were used in all cases, but not each method was utilized at every stage of the process.

| Data Collection Method | Stage of the Process | | | |
|---|---|---|---|---|
| | Introductory Meeting(s) | Establishment of Functional Views | Data from Other Sources | Reaching Consensus |
| Unstructured Interviews | Beginning and final parts of the meeting | Final part of the meeting | With non-functional heads; shop-floor employees | - |
| Semi-Structured Interviews | Main part of the meeting | Beginning of the meeting | - | Interspersed throughout the meetings |
| Structured Interviews | - | Filling-out of the survey form | - | - |
| Documentation | Introductory materials provided by the contact person | - | Examination of company and external records | Documented evidence presented during meetings as appropriate |
| Direct Observation | - | - | During factory tours | During the debates among participants |
| Participant Observation | - | - | During business meetings and presentations in cases A and E | Presentation of data compiled at earlier stages |
| Group Discussions | - | - | - | Entire meeting facilitated by the researcher |

**Table-3.2 Data Collection Methods and Their Use in the Study**

More descriptive information on the use of the these techniques is included in the "field procedure," outlined in section 3.5.

### 3.4.2. Unit of Analysis

After the basic questions (hypotheses, or propositions) of the study have been formulated, Yin (1989) asserts that defining what "the case" is has long been a fundamental problem for many researchers. He sees the determination of the correct unit of analysis as a key step to be completed prior to proceeding with data collection. Typically a case may be an individual, however, it can also be some event or entity, such as decisions, programs, implementation process, and organizational change. Naturally, the definition of the unit of analysis would be dependent upon the way the initial research questions are stated. Within this context, the unit of analysis in this study can be stated as "the process of determination of qualifying and order-winning criteria in a manufacturing firm." In

the more traditional sense, a unit (the organizational level at which a case was based) was *the business unit*—a natural choice since the research question was part of strategy formulation at the functional level (operations) in support of the business strategy, which is typically determined at the business unit level.

### 3.4.3. Sampling (replication)

Sampling in multiple-case study research follows an approach different from statistically-based empirical studies, and is analogous to the approach typically used in multiple experiments. The term used by most researchers is "theoretical sampling." (Glaser & Strauss, 1967; Eisenhardt, 1989; Gummeson, 1991; Platts, 1993) This contrasts with "statistical sampling," in which selection of data points follows statistical methodology, i.e., the sample must be randomized and be representative of the overall population being studied, both in makeup and in size. In theoretical sampling of cases, on the other hand, researchers purposely select sites the characteristics of which vary in predetermined ways, many times being at two ends of a continuum. (Meredith, 1998) This allows the testing of the feasibility of the overall framework in different situations which are deemed relevant to the issues being studied. Yin (1989) intentionally avoids the term "sampling" for multiple case design, in favor of "replication," because earlier analogies, he asserts, mistakenly equate multiple cases to multiple respondents in a survey. In multiple case designs each site studied is an individual case study—a replication—similar to a single experiment. Each case confirms or disconfirms the hypothesis. This allows the analysis stage of the study to include cross-case comparisons—a technique frequently used in this study analysis; see chapter-5—in addition to the standard within-case analysis.

There is no correct number in terms of how many cases should be used in a multiple-case design, although Eisenhardt (1989) suggests *four to ten cases* (these numbers appear to be grounded in her experience as a case researcher and in practical considerations, rather than any scientific rationale). Meredith (1998) also provides some rule-of-thumb guidelines for the number of units of analysis applicable in various research methodologies, and assigns a range of *two to eight* units to multiple case studies. Since the purpose of multiple-cases is not the achievement of statistical generalizability, "saturation" is used to determine the number of cases needed to achieve external validity. Glaser and Strauss (1967) define saturation as the state beyond which each additional case provides diminishing marginal contribution; i.e., the incremental learning to be achieved by each

additional case is minimal. External validity, therefore, is achieved through "analytical" generalization (Yin, 1989), i.e., the researcher tries to generalize a given set of findings to some broader theory rather than generalize to a larger universe, as is the case with statistical generalization. The aspect of generalization and other measures of research rigor as they relate to case study and action research, and how they were achieved in this study, will be covered in detail in the conclusion chapter.

In this study, *five* in-depth cases were used. Certain characteristics of the companies studied varied, consistent with the aims of theoretical sampling, e.g., size, product type, closeness to the end-user. Other attributes were kept constant, such as, industry and process type. Those attributes that are relevant to the nature and content of the research question, and the rationale for their use as selection criteria, are outlined below.

Attributes Held Constant

- *Industry (sector)* – An overwhelming majority of the published work on operations strategy involves goods-producing firms, rather than companies in the service sector. Furthermore, the concepts of qualifying and order-winning criteria were developed in manufacturing industries, although some limited applications in the service industry have started to appear. (Hill, 1994) In order to take advantage of the existing body of knowledge, and of the researcher's extensive background in the manufacturing sector—an important qualification for a case researcher (Yin, 1989)—this study involved only discrete product manufacturing firms.

- *Process Type* – Of the four basic manufacturing process types (jobbing, batch, assembly-line, continuous process), batch is the most commonly used (Hayes and Wheelwright, 1984; Hill, 1994; Krajewski and Ritzman, 1996) and, according to the product-process matrix, it is associated with the product/industry life cycle stages that exhibit high product variety. (Hayes and Wheelwright, 1984) Since Hill's model emphasizes the identification of order-winners/qualifiers for each of the firms' products/markets (attempting to highlight the multitude of demands companies face), selection of companies using batch processes was considered to be a good way to encounter the product variety desired. (Hill, 1994; also see section 2.3.1, research proposition 5) As a result, all firms included in the study employed batch processes.

Attributes Varied

- *Company Size* – Since a primary focus of this study was the diversity of functional views on a company's basis of competition, the size of the organization was deemed to be a determinant of the number of functions and, consequently, of functional heads. Inclusion of *small* (cases B, C, and D), *medium* (case A) and *large* (case E) companies achieved the range of representation desired.

- *Product Type* – Demands put on a manufacturer by its customers ordering *standard* products are likely to be different from those ordering *customized* products. (Hill, 1994) This would manifest itself by the number and types of qualifiers/order-winners attributed to those groups of products. Three of the companies selected (cases B, C, and D) manufactured a mix of standard and custom products, the other two made only standards, thus capturing the diversity expected.

- *Manufacturer's distance from the end-user* – As Menda and Dilts (1997) first pointed out, many manufacturers are removed from the end-users of their output by one or more levels of customers. This situation may have a direct impact on the number and type of qualifiers/order-winners generated by each customer in the chain. In this study, one company sold directly to end-users (case D), two had customers that were end-users or intermediaries, depending on the product (cases B and C), and two firms sold their products to intermediaries only (cases A and E).

Selection of two of the sites (cases A and E) were also influenced by the researcher's employment at the firms, providing the opportunity to carry the investigations to deeper levels, especially in data triangulation through more extensive examination of documents, due to easier access.

### 3.5. The Field Procedure (Elements of Site Visits)

The existence of a descriptive and sufficiently detailed procedure to be used during the site visits significantly increases research reliability in case studies. (Yin, 1989) A typical field procedure

includes a structured sequence of activities, identifies types of participants, examples of opening questions to be posed by the researcher during individual interviews, and a basic list of essential data to be collected from each site. Although case studies involve events within their real life contexts, and data are collected from existing people and organizations rather than within the controlled environment of a laboratory (which mean that variations are inevitable), a well defined field procedure ensures a common level of consistency across cases, thus improving its repeatability.

The following describes the basic procedure followed during the site visits in this study.

1- Access and Introductory Meeting(s)

- Establish a primary contact to serve as the "owner" of the process. This person must be at least the highest ranking operations/manufacturing officer.
- Conduct an initial meeting (typically between one and two hours) with the primary contact to describe the research objectives, the steps involved, and how the process can benefit the firm.
- During the same or a subsequent meeting (depending on the availability of the subject), complete the following:
  - Obtain a general overview of the firm's history, market segments, products, organizational structure, and manufacturing processes. Obtain documents containing the above information, such as company information leaflets, annual reports, sales literature, product catalogs, organizational charts.
  - Determine the participants to be included in the study. Include the primary contact, all key functional managers in operations (manufacturing/plant manager, materials manager or equivalent, engineering or design/product development manager, etc.), at least one or both of marketing and sales managers, and others as the primary contact sees fit.
  - Select, in conjunction with the primary contact, a list of "means of competing" (qualifying/order-winning criteria) from the master list of criteria compiled through literature search (see section 2.3.3).
  - Establish the primary market or product-line segments to be used on the survey form during the individual interviews. Indicate to the primary contact person that this grouping

would be preliminary, but it is required to cover all products made and sold by the company.

This phase could take an additional one to one-and-one-half hours.

2- Establishment of Individual Views

- Distribute to each participant a brief document which describes the research objectives and a list of definitions of the terms and concepts to be used during interviews and group meetings (a sample is included in appendix-IA).
- Conduct one-on-one, focused interviews with each participant to solicit their individual views on qualifying and order-winning criteria for each of the firm's major markets/product lines. Include all major product lines in the assessments of all participants except in those interviews with product-line-focused marketing managers. With those individuals, solicit their views only on the products for which they are responsible. Use a survey form, customized for the firm using the specific set of criteria selected, to record the responses. Provide the participant with an unfilled copy for his/her reference during the interview (a sample form included in appendix-IB). It is important that at this stage of data collection, participants should not be made aware of the responses by other participants.

  The basic structure of an individual interview (one to two hours in length) and typical questions are as follows:

  - Reintroduce the basic concepts of qualifiers and order-winners and the definitions of criteria while allowing the participant to refer to the introductory letter previously sent.
  - Start with the market/product group segments identified during the preliminary conference with the contact person and allow the participant to redefine the segments if he/she prefers.
  - Continue the interview by asking at least the following questions, and others as needed:
    - "How does your company *qualify* to become a player in this market?"
    - "Of the remaining criteria, which ones differentiate your company's products and enable you to *win more orders* in this market?"
    - "How do you rank those criteria in terms of their importance in winning orders?"; "Please assign a percentage to each."

- "Do you expect those weightings to change significantly in the next two to four years?"

Indicate to the interviewees that they are free to add new criteria or rename/redefine existing criteria if needed.

- Once all product groups have been assessed, ask the participant the following questions:
  - "Do these segments and their weighted criteria adequately describe your firm's competitive situation?"
  - "If not, how would you change the segments and/or the criteria to better represent the competitive priorities?"

3- Collection of Data from Other Sources

- Take a detailed factory tour with the top manufacturing executive, focusing primarily on process types and layout, material flows, and degree of automation. Look for visible signs of performance measures emphasized (e.g., charts/tables posted at work stations and on bulletin boards).
- Extensively review company documents to collect evidence confirming or contradicting the views expressed by participants on priorities the firm places on the means of competing. At the minimum, request the following documents if available: current company and functional (especially marketing and manufacturing) strategic plans, product costing sheets, capital investment plans, on-going project lists, historical production output records, periodic performance reports. In examining those documents, emphasis should be on explicit statements related to priorities in, for example, written strategic plans, business/functional objectives, or marketing plans, as well as implicit priorities communicated through reported performance measures.
- Carry out unstructured interviews with key manufacturing staff and conduct observations on the shop floor to collect evidence on prevailing culture, measures emphasized, and types of priority calls made in everyday settings (the basic framework of a typical interview is provided in appendix-IC). The number of occurrences and their duration in this step can be adjusted based on the availability of company documents in the previous step.

- Compile the data collected and patterns/discrepancies discovered. Summarize, in tabular form, individual participants' ranking of qualifiers and order-winners (appendix-IIA). Illustrate the differences (if applicable) in market segmentation among participants.

4- Reaching Consensus Through Group Meeting(s)

- Facilitate a group discussion with all participants in which a summary of functional views and data compiled from other sources are presented, and discrepancies are debated (an example agenda for such a meeting is provided in appendix-ID). Remove participants' or their functions' names from the quantitative summary of the individual assessments to preserve anonymity. A typical group meeting would take three to four hours, with one 30 minute break halfway through. A single meeting would be preferable, although for groups more than 15-16 participants, two or more meetings would ensure that each participant can contribute to the discussions.
- Conclude the meeting with a consensus on qualifying and order-winning criteria for the firm's markets/products.

5- Closure

- Provide the primary contact in the company with a written summary of the individual views, major points discussed during the group meeting, and the consensus reached (example in appendix-IE).

# Chapter 4. CASE DESCRIPTIONS AND ANALYSIS

The fieldwork in this research involved five in-depth case studies conducted at business-unit level, over a three year time-span. The companies varied in size, industry (see section 3.4.3, and table-4.1 below), and location—four of the firms were in Canada and one in the United States. This chapter provides summaries of individual case descriptions and analysis of evidence within the theoretical propositions outlined in chapter 2.

## 4.1. Overview of Individual Cases

In this and following chapters individual cases will be identified by letters "A" through "E" to simplify the narration. The actual names of the firms have been used in the section titles of each case summary.

The following table summarizes the basic company information for each case.

| | CASE A | CASE B | CASE C | CASE D | CASE E |
|---|---|---|---|---|---|
| **Industry** | Pharmaceuticals | Plastic Molding | Steel Case Goods | Chemicals | Pharmaceuticals |
| **Primary Products** | Brand-name over-the-counter drug products | Interior panels for recreational vehicles and subway cars; garden hose; custom-molded parts | Laboratory cabinets; fume hoods; cabinets for refrigeration units | Laboratory reagents; assistive drugs & chemicals | Brand-name over-the-counter drug products |
| **Annual Sales ($)** | 150 MM | 5 MM | 6 MM | 28 MM | 1,300 MM |
| **Number of Employees** | 340 | 45 | 60 | 130 | 1,800 |
| **No. of Manufacturing Plants** | 1 | 1 | 1 | 1 | 3 |
| **A Business Unit of a corporation?** | Yes | No | No | Yes | Yes |
| **Access Gained Through** | VP-Operations | Owner/General Manager | President | General Manager | VP-Operations |

**Table-4.1 Key Company Data**

The cases, other than cases A and E (at which the researcher was an employee), were extracted from a convenience sample in geographic proximity—within a two-hour commuting distance in Southern Ontario, Canada. The specific firms were selected based on the researcher's prior knowledge of the access persons in the companies and their willingness to participate in the study.

Key comparative information on the fieldwork and data collection phases of the study is shown in the following table.

| | CASE A | CASE B | CASE C | CASE D | CASE E |
|---|---|---|---|---|---|
| **Total Time for Data Collection**[1] | 4 months | 4 months | 12 months | 11 months | 5 months |
| **Number of Participants**[2] | 16 | 5 | 5 | 8 | 21 |
| **Number of Site Visits**[3] | N/A | 9 | 7 | 8 | N/A |
| **Number of Facilitated Group Discussions** | 1 | 1 | 1 | 1 | 4 |
| **Type(s) of Participant-Observation Carried Out**[4] | Researcher-as-employee | Participant-as-observer/ Interrupted involvement | Participant-as-observer/ Interrupted involvement | Participant-as-observer/ Interrupted involvement | Researcher-as-employee |

**Table-4.2 Key Information on Data Collection**

The case description summaries presented in this chapter follow a structure consistent with the proposed process model illustrated in section 2.3.2 and the field procedure outlined in section 3.5. To improve readability, each case description, following a company overview, is presented in a two-column tabular format. The first column describes each step in the process and its outcomes; the

[1] Covers the total calendar time between the initial meeting with the highest-ranking officer (access person) and the final group meeting. Up to three individual interviews were conducted in a single day, although one to two interviews at the same site were more common. Since participants' availability varied, and some interviews had to be rescheduled, in some cases interviews were three to four weeks apart. The most common difficulty was the scheduling of the group meetings. In the extreme cases (C and D), the final group discussions took place approximately three months after the previous site visit.

[2] This represents the number of functional managers whose views on qualifiers and order-winners were recorded during structured interviews. Unstructured interviews were also conducted with 10 other employees in key positions.

[3] The number of ½-day site visits have not been recorded for cases A and E since the researcher was present at the sites as an employee, although the research occupied approximately 25% of his time.

[4] For definitions see section 3.4.1.

second provides an in-depth, within-case analysis of the key events. Quantitative data summarizing the weights assigned to criteria by the participants are shown as numbered tables in appendix-II-A.

## 4.2. CASE A - MCNEIL CONSUMER PRODUCTS, CANADA

### 4.2.1. Company Overview

McNeil-Canada (MCPC) is one of a number of operating units of the large multinational corporation, Johnson & Johnson (J&J), marketing a range of over-the-counter (OTC) pharmaceuticals for the Canadian market. The company is a spin-off from McNeil Pharmaceuticals, another J&J unit, marketing prescription (Rx) drugs. In the early-eighties, their flagship brand, Tylenol, became over the counter in Canada[5]. As a result, sales of this popular pain remedy increased significantly, prompting the spin-off of MCPC as a separate entity, and building of a new plant outside Toronto, Ontario, to meet the increased demand of the OTC Tylenol. Within a few years the firm added to its lineup a wide range of derivatives under the Tylenol name (e.g., Sinus/Cold remedies, Children's Tylenol), as well as new brands such as Medipren and Lactaid. In the late eighties, when the original plant of the prescription drug unit was shut down, manufacturing of the Rx versions of Tylenol was transferred to the newer McNeil Consumer plant. However, the sales and marketing responsibilities of the Rx brands remained with the original company, which also markets and sells a range of other ethical drugs.

Although MCPC's products are pharmaceuticals, they are marketed and sold in the highly competitive consumer market as over-the-counter products. Moreover, the segments of the market in which the company competes are somewhat fragmented. Several multinational companies compete in those segments with their own brand-name preparations as do many smaller companies that manufacture private-label (store brand) versions of those drugs. Even though the store brands sell at much lower prices (sometimes as low as half the price of a national brand), brand-name products still dominate those markets with a combined share of 65 percent.

The manufacturing processes in the plant are highly capital intensive. Products are standard, made to stock, and are batch-manufactured to exacting specifications which exceed the Canadian Health Ministry's Health Protection Branch guidelines (equivalent to the U.S. Food and Drug

[5] In fact, the plain pain-killer/fever-reducer version of the drug was given OTC status; its other versions, which contain a narcotic ingredient, for severe pain relief, remained as a prescription drug.

Regulations). Production in the plant takes place as two major groups of activities: processing and packaging.

In *processing*, powdered ingredients are converted into bulk tablets or liquid preparations. Each piece of equipment is dedicated to a single operation, such as dispensing, granulation, blending, compression, coating, or liquid-mixing, with lot sizes dictated by the capacity of the particular processing equipment.

In *packaging*, containers (plastic bottles) are filled with the bulk tablets or liquids produced in the previous processing stages, and these containers are capped, labeled, safety-sealed, put in cartons, and packed in cases by automated equipment. A packaging line is arranged as a sequential set of processes with the containers moving from one operation to the next on conveyors that link the machines. Typically these lines are dedicated to running a narrow range of similarly shaped container sizes to minimize the number of changeovers.

All equipment used in the processing and packaging operations is cleaned and set-up between product runs to meet the strict requirements stated in the food and drug regulations. Currently the plant has four packaging lines, each handling a specific group of products.

| Process Step Outcomes | Analysis |
|---|---|

### 4.2.2. Study Participants

Through separate discussions with the vice-president of operations and the OTC marketing director, the following individuals were selected as study participants (the functions represented by the individuals are provided in brackets, following the job titles):

- *Vice President of Operations* (plant operations)
- *Sales Director—OTC* (sales of over-the-counter products)
- *Marketing Director—OTC* (marketing of OTC products)
- *Marketing & Sales Dir.—Rx* (sales and marketing of prescription [Rx] products)
- *Materials Manager* (production planning, inventory control, purchasing, distribution)
- *Production Manager* (manufacturing—processing and packaging)
- *Cost Accounting Manager* (operations accounting)
- *Quality Assurance Manager* (quality control)

Since the researcher was an employee at the firm at the time of the study, access to the company through a single, high-ranking officer was not essential. Nevertheless, the vice president of operations, the researcher's immediate supervisor, acted as the primary sponsor of the study because he also planned to carry the outcomes of the study (i.e., the assessment of the qualifiers and order-winners for the business) through to the full implementation of a new operations strategy. This allowed the researcher to have freer access to company documents and more flexibility to request unscheduled interviews with participating and other managers.

The study participants in this case represented all of the typical operations-related functions, alongside key marketing and sales departments. The only operations-related function left out was engineering, which, at the time, was headed by this researcher. The exclusion of one key function from the study was seen by the researcher as a reasonable price to pay in order to prevent bias.

### 4.2.3. Selection of Criteria

The comprehensive list of criteria included in section 2.3.3 was shown to the VP of operations and OTC marketing director during separate meetings. They were asked to select eight to twelve criteria which, in their view, were important to the company's business as the basis of competition. The subset selected by the two executives was used in the survey forms during the structured interviews with all participants. The managers were asked to modify, combine, delete from, or add to the list if they thought necessary for the markets/product groups under consideration. The list used in MCPC is shown below.

- Price
- Delivery speed
- Delivery reliability
- Unique and value-added features and services
- New product lead-time to market
- Preferred supplier status and corporate reputation
- Product range
- Design/Package leadership

Two points about this list are important to note. First, quality, as a criterion, was not selected for inclusion in the subset in spite of the fact that the attainment of specific quality levels is mandated by the regulatory agencies and also demanded by customers. The marketing and operations executives reasoned that quality conformance was a "given" in all markets, and that its inclusion in the list would be redundant. In stating that, in effect, they regarded the criterion as a qualifier, although neither of them used the term.

Second, a new criterion was added to the list at the request of the OTC marketing director: "unique and value-added features and services," which was defined as:

> *Ability to offer product features, such as 'superior dosage forms' which provide product differentiation and convey a quality image for the brand; as well as offer trade and consumer support services, such as product information leaflets in multiple languages, toll-free information hotline, and free store shelf-management support services for the trade.*

In the marketing director's opinion, none of the criteria in the comprehensive list came close to describing this key characteristic of MCPC's marketing strategy. Interestingly, he went to great lengths to use a descriptive criterion and provided a detailed definition for it, rather than using a more generic term such as "service." (more on specific versus generic criteria will be discussed in chapter 5.)

### 4.2.4. Initial Market/Product-line Segments

Discussions with the marketing director led to the decision to use the existing brand segmentation scheme as the starting point during individual assessments. Basic information on the OTC segments is presented below.

- *Adult Pain Relief* – Tylenol products in various formats and package sizes, formulated in adult strengths; 60% of total sales; 22 end-products.
- *Children's Pain Relief* – Tylenol products in liquid and chewable tablet forms, formulated in infants' and children's strengths; 16% of sales; 8 end-products.
- *Cold, Flu and Sinus Relief* – Tylenol-based products with added active ingredients to relieve sinus and cold symptoms; 16% of sales; 16 end-products.
- *Arthritis Medication* – Medipren brand products used as an anti-inflammatory drug; 3% of sales; 6 end-products.
- *Lactose Intolerance Remedy* – Lactaid brand products which contain the enzyme that aids in the digestion of dairy products; 5% of sales; 4 end-products.

The marketing function of MCPC is organized around product groups and brands which are managed by brand managers, and overseen by the marketing director. Those brands compete in five OTC market segments as described in the column on the left. Primary basis of segmentation is the symptom or group of symptoms relieved by the drug. Some segments are further subdivided into adult and children's versions—a distinction achieved by adjusting the amount of active ingredient in the products.

This type of segmentation was a reflection of the marketing function's view of the markets—groups of consumers that can be persuaded to use the company's products on the basis of the illness they suffer from. This allowed the marketers to tailor their advertising and other promotional programs to the specific needs of those groups of end-users. Although many of the products from different segments contained similar raw materials and common manufacturing processes, they also exhibited some segment-specific characteristics such as unique dosage form (chewable tablets for children, versus swallowable tablets for adults), or seasonality (higher seasonal demand variations with cold & flu products).

The existence of this well-accepted and institutionalized brand management structure based on market segmentation made the initial grouping easier to establish and to later explain to individual participants. Although at the end of the final group meeting many of

The group of prescription products manufactured by MCPC and marketed and sold by its sister company was treated as a separate segment, and defined as follows:

- *Severe Pain Relief* – These Tylenol products contain a narcotic ingredient in varying strengths alongside the basic Tylenol formulation. Their sales dollars are not reported by MCPC, however they comprise approximately 19% of the plant's unit output with 12 end-products.

the brands were combined into larger groups based on the similarities in their market characteristics, this scheme served as a convenient starting point in this case.

### 4.2.5. Summary of Individual Responses

Individual, structured interviews were conducted with each participant in order to record their assessments of the qualifying and order-winning criteria for the firm's products. However, prior to the establishment of functional views, the OTC marketing director (MCPC) and the Rx marketing and sales director (McNeil Pharmaceuticals) indicated that they would first solicit the views of their brand managers (four for OTC and two for Rx). Those managers assessed only the brand(s) of which they had

One interesting phenomenon which occurred during this stage of the case was the reluctance (or unwillingness) of the participants to use the concept of qualifiers. Perhaps because they did not feel totally comfortable with the conceptually distinctive nature of qualifiers, they preferred to use order-winners exclusively to differentiate among the criteria. This may explain the prevalence of low (5 – 10%) weightings in many participants' assessments. By assigning low percentages to several criteria in each product group, those managers may, in effect, have intended to merely highlight the relevance of the criteria without overemphasizing their role. Whether at least some of those criteria should have

responsibility. Following a similar approach, the OTC sales director asked his two subordinates (assistant sales director, and customer service manager) to assess all the brands and return the results to him. Those six managers filled out the survey (an example provided in appendix-IB) on their own and submitted them to their respective directors.

The directors then filled out their own copy of the survey form in a draft format, incorporating their own views alongside their subordinates'. The draft forms were then discussed with the researcher during the individual interviews and changes, additions, and deletions were made based on the discussions that ensued. The outcome of each interview was a single set of assessments for MCPC's products representing each function's views.

The assessments by the non-marketing/sales functional managers were more straightforward. Each manager and the VP of operations filled out the survey form during the individual interviews for all the products manufactured by MCPC (OTC and Rx). As can be seen in table-4.3, all participants considered the order-been designated as qualifiers could not be determined (analysis of case E provides more insights into this phenomenon).

Examination of table-4.3 reveals a wide disparity in the participants' assessments of order-winners for MCPC. This difference is especially evident in the prescription products segment in which, for example, price received weights ranging from zero to 65%, and unique/value-added features was assessed values between zero and 70%. Only the Rx marketing/sales director attributed no weight to unique features, whereas in all the other managers' view this criterion weighed-in heavily. This polarization of views on those two criteria, along with the data collected by the researcher from other sources to provide triangulation (summarized below), triggered considerable discussion during the final group meeting.

winning criteria for all OTC products to be sufficiently similar and grouped them as "OTC Products." Similarly, the products that comprised the Rx Tylenol group were named "Rx Products" and a single set of order-winners was assigned to them.

### 4.2.6. Data from Other Sources

In order to check the validity of the statements made by the participants during the interviews and to provide additional relevant information for the researcher to present at the final meeting, several different sources were used to collect objective data. The sources ranged from functional strategic plans, sales histories, inter-office memoranda, and standard cost sheets, to unstructured interviews with lower level marketing and operations staff.

Primary focus was the review of marketing plans which detailed market share data over several years, assessments of competition, and future marketing strategies for the OTC products, as well as interviews with Rx marketing staff. The former had the aim of understanding the key market drivers for OTC pharmaceuticals and the firm's response to them, and the latter intended

MCPC's products are considered the premium brands in their markets; their retail prices are at a 50 to 70 percent premium over their generic or store-brand competitors. Market positioning of those products is "high-quality brand-name products the users can trust."

The company relies on a collection of marketing and sales strategies to differentiate its products, maintain the brand image, and increase market share. They are:

- Introduction of new dosage forms and line extensions to leverage existing brand equity, fill in the gaps in the existing market segments, and create new sub-segments.
- Use of direct mail and target mail marketing to lure users of competitors' brands.
- Utilization of seasonal promotional programs for trade customers to stimulate sales.
- Use of physician and pharmacist detailing to encourage professional recommendation and to facilitate patient counseling.
- Heavy use of print and TV advertising.
- Providing value-added services for the trade

to uncover the specific characteristics of the Rx market that differentiated it from the OTC market.

customers (e.g., shelf management service, shelf-organizing materials), and for consumers (800 information line, product samples).

The prescription drug market, on the other hand, operates in a manner that is different from the OTC market. The federal and most private prescription drug plans favor the cheaper generic brands when such a substitute exists, unless the customer specifies a brand-name. Since patents on the Rx version of Tylenol had long expired, generic substitutes had been introduced and had captured more than 50% of that market. This has lead to heavy price pressure on the national brands. Furthermore, consumer advertising of prescription drugs was against the drug regulations at the time of the study, and no other promotional activities for the trade customers were allowed. In such an environment, communication of product differentiation and value-added services to trade and final customers was extremely difficult. Examination of government-issued drug price lists, and further discussions with sales and marketing staff at the Rx unit revealed that the company's pricing policy was to match the generic brands' prices in the tenders submitted each year. This allowed the company to have their products included in the list of prescription drugs eligible for reimbursement by the government drug plan.

### 4.2.7. Consensus View of Markets and Order-Winners/Qualifiers

A group meeting was convened which included all study participants. Following a brief introduction by the researcher on the study objectives and a review of the concepts and methodology used, a graphical representation of the functional assessments of the order-winning criteria was shown (an example is provided in appendix-IIB). Since the purpose for this presentation was to simply demonstrate the range of views on the order-winners and help stimulate a debate on the differences, the names of the functions were deleted from the graphs to preserve anonymity.

The illustration of individual assessments was followed by a brief summary of the additional data collected by the researcher on the characteristics of the OTC and Rx markets. The discussions which ensued resulted in a consensus as summarized in table-4.4.

The consensus assessment of the order-winners for the OTC products segment closely matched the overall distribution of weights in the individual responses. However, the sales manager voiced his objection to the group's conclusion that price was not an important criterion (as can be seen in table-4.3, the highest individual weight assigned to price [20%] was by the OTC sales manager). In his view, the amount of price premium over the store-brand competitors' products should not be allowed to exceed a pre-determined maximum. This, for him, made price a key order winner. Although the other participants countered by indicating that this did not mean MCPC competed on the basis of low price, the sales director wanted to go on record with his "dissenting" opinion.

Comments made to the researcher by this participant during earlier discussions shed some light on his line of thinking. In his view, low or no emphasis on price as an order winner would certainly result in low or no emphasis by the manufacturing function on cost, which would gradually lead to higher standard costs. Since the company could not afford a corresponding increase in price because of the sensitivity of the existing price premium, the cost increase would result in reduced funds for sales promotions, diminishing the sales force's ability to "make the numbers." Thus his insistence on emphasizing price as an order winner.

This kind of "turf protecting" behavior by the sales executive may influence strategy making in companies.

Although it had sound logic on its own, the functional thinking exhibited here added a political dimension to the formation of an operations strategy in this case—a process which was designed to emphasize an overall business approach. Fortunately for MCPC, the director agreed to "go along" with the consensus view of the markets as summarized in table-4.4, as long as his objection was noted. Other companies may not be so lucky (this point is discussed further in section 6.1.2).

Discussion on the prescription products segment was more heated and longer. MCPC managers argued in favor of assigning high percentages to value-added services, indicating that Tylenol was a respectable brand name even in the prescription drug market. In their view, the Rx drug unit too *should* be competing on differentiation and should leverage the brand awareness of the OTC version, all the while charging a premium price. The Rx sales and marketing director countered by explaining the different dynamics in the Rx market, the impact of federal reimbursement policies on the way companies compete, and how those resulted in the existing pricing policy which kept the products at the generics' price level. This fact was also corroborated by the researcher's presentation of the documentary evidence (company drug price list). These revelations, after some discussion, led to the group's agreement that the Rx products competed primarily on the basis of price and to a much lesser extent on delivery reliability and corporate reputation (table-4.4).[6]

[6] Although the consensus assessment identified price as an order-winner, the facts put forward by the participants and data collected by the researcher support the conclusion of price as a qualifier (i.e., price brings the product to equal

At the end of the group meeting the participants expressed their satisfaction with the outcome of the process. The marketing and sales directors from both companies were enthusiastic about the prospects of renewed focus by the manufacturing function on the market demands. However, the operations managers indicated that they needed to convene another meeting among themselves to figure out what those demands meant for the function's future strategy. Translation of those criteria into a set of coherent manufacturing objectives was needed before they resulted in the generation of action plans. They stated that at least two of the criteria, value-added services and preferred supplier, did not appear to be directly manufacturing-related, therefore they were not "actionable" at first glance.

## 4.3. CASE B – SHIRLON PLASTICS INC.

### 4.3.1. Company Overview

The company, situated in Cambridge, Ontario, was purchased by its current owner in 1989 from its then parent company, ABC Group—a large blow-molding manufacturer with $165MM. in sales. Initially it supplied a limited number of plastic parts for recreational vehicle (RV) manufacturers, using a rotational molding process. The company subsequently added vacuum forming machines to also supply the RV market with other parts that cannot be made by rotational molding. During the recession of the early-nineties the company decided to diversify in terms of the markets it served

consideration with generics; what wins the order is the familiar brand name). This point is discussed further in chapter-5.

since the orders from its RV customers had slowed down. To improve overhead absorption the company had to explore new markets which could be supplied by the use of existing processes.

The firm's owner, who heads the marketing efforts, defines Shirlon as a leading-edge, innovative design and manufacturing firm which supplies low-volume, niche-type products in a variety of markets. Other than the RV market, the company now makes interior panels for mass transit vehicles, electrical components for power utilities, recycling bins for local municipalities, and gardening products for mass merchandisers. Sales volume for the year 1995 was approximately $5MM, and the firm employed 45 people, approximately 75% of them in manufacturing.

The manufacturing plant utilizes three primary processes, on a two-shift, five-day basis: rotational molding, vacuum forming/thermoforming, and continuous extrusion. In rotational molding, pulverized and pre-weighed resin pellets and pigments are piled inside a mould which then moves through the three stages of the process while rotating: heating, cooling and unload/reload. Many parts require secondary operations following molding operation, such as trimming, testing, fitting and installation, which are performed at the same station by the molding operators. Waste water and septic tanks for RVs, bins, tote boxes and picnic tables use this process.

Vacuum forming is mostly used to make panels for mass transit vehicles and appliances, as well as bathtubs and shower-pans for RVs. It uses flame-retardant PVC sheets, which are heated and formed under vacuum, and then cooled. Process cycles are relatively slow to facilitate appropriate control of tolerances. Since material cost represents approx. 60% of selling price, yields are important.

The third process type, continuous extrusion, is used for garden and compressed-air hoses. Three stages of the process are: core tube extrusion, braiding, and outer jacket coating.

Production is triggered by firm orders, in batch sizes varying between 20 and 500 pieces, except for garden hose, which is made to stock prior to the summer season. Batch quantities typically exceed firm orders for standard parts with historically repeating orders.

| Process Step Outcomes | Analysis |
|---|---|
| **4.3.2. Study Participants** | |
| The primary contact in the company was the owner/general manager, who also handled the marketing function. Discussions with him led to the decision to include all managerial staff in the firm as study participants. Below is the list of participants (by their titles in the company) with the traditional functions they represented shown in brackets.<br>• Owner/General Manager (Marketing)<br>• Sales Manager (Sales)<br>• Designer (Product Development Engineering)<br>• Production Manager (Manufacturing, Engineering, Quality)<br>• Extrusion Manager (Extrusion Manufacturing & Quality) | Due to the small company size, selection of study participants did not represent any problems. All managers participated in the assessment of all the product groups, with the exception of the Extrusion Manager. His position was unique in the company since he was responsible only for manufacturing of products using the continuous extrusion process, therefore his views were recorded only for the garden hose segment of the business (he had indicated during the initial interview that he did not have sufficient knowledge about the rest of the business). |
| **4.3.3. Selection of Criteria** | |
| The master list of criteria shown in section 2.3.3 was examined by the owner, and a set which represented the overall competitive factors for Shirlon was selected jointly by the owner and researcher following a short discussion. This list was used in the survey forms during the structured interviews with the | Eight of the criteria were taken directly from the master list; and the addition of one, product uniqueness, was suggested by the owner. This was done as an apparent reference to the characteristics of the "municipal products" segment, which required the design of products for specific uses. The company considered this relatively new market as a growth opportunity and one that can be exploited through superior design. |

participants. The managers were allowed to modify, delete, or add to the list as they saw fit for the markets/product groups under consideration.

The main list used for Shirlon consisted of the following nine criteria:

- Price
- Delivery speed
- Delivery reliability
- Quality conformance
- Technical support
- Existing supplier status
- Product range
- Product performance
- Product uniqueness

### 4.3.4. Initial Market/Product-line Segmentation

Discussions with the owner revealed four primary product groups, which were treated as market segments during the subsequent structured meetings.

- *Recreational Vehicle Products* – plastic parts used in RVs and supplied to original equipment manufacturers (OEMs) and independent repair shops (~32% of sales).
- *Custom Products* – custom-designed parts for mass transit vehicles,

Although the firm did not have a formal marketing department or a written marketing plan, the owner, who performed some of the marketing tasks himself, did not have any difficulty segmenting the company's markets. In his view, the firm's products naturally fell into segments based on customer types since specific products were manufactured for specific customers, i.e., there were no standard products made for multiple markets.

This segmentation proved practical for the rest of the participants, as demonstrated by their acceptance of the groups during individual assessments (next section).

electrical components for power utilities, tote boxes and other material handling containers for assembly shops (~25% of sales).

- *Municipal Products* – recycling bins, traffic pylons, street flower-boxes for local municipalities and townships (~3% of sales).
- *Home and Garden Products* – picnic tables, mail boxes, garden hose (~40%).

### 4.3.5. Summary of Individual Responses

Individual, structured interviews were conducted with each participant during which their responses to the question "how do your company's products qualify and win orders in their markets?" were recorded.

As stated above, the responses by the extrusion manager related only to the home and garden products segment since the extrusion process, a unique operation on which this individual was considered an expert, was used exclusively for the manufacture of garden hoses.

The results are summarized in table-4.5 (qualifiers are shown as "Q," and the numbers signify the relative

As can be seen in table-4.5, two of the criteria were restated during the interviews: "product performance" as "product functionality," and "product uniqueness" as "unique product design." The differences in their meaning could be considered subtle, however, the restatements served as clarification of the concepts and as narrowing of meaning to help other participants better assess their importance.

The replies, as in the previous case, show significant variation. The differences were not confined to the relative importance assigned to specific criteria; variations also existed for certain dimensions in terms of their nature—whether they were considered to be qualifiers or order-winners. One extreme example is the dimension of "existing supplier" for RV products. Whereas the owner considered it an order-winner with a weight of 75%, the production manager believed it to be

importance of each order-winner).

simply a qualifier, and other participants treated the criterion as one having no importance. As stated in chapter 3, the researcher did not point out any of this variability to the participants during this phase of the study. His primary focus was to ensure the participants had ample opportunity to ask questions, seek clarification, and express any other opinions related to the way in which their products competed in the marketplace. At each interview, only any inconsistency between the qualitative information given the researcher and the weights assigned to criteria by the same participant was explored, and resolution was sought.

**4.3.6. Data from Other Sources**

Opportunity for in-depth data collection from other sources was limited in this case. Other than being a small company, the firm's business affairs were also managed rather informally (only a limited number of procedures, or historical records existed), by the owner who had a technical graduate degree in plastics.

Additional data collection was therefore confined to shop-floor observations, unstructured discussions with various personnel and examination of a limited number of company documents. Nevertheless, valuable information was gathered during this step which aided in the presentation of

- There existed an after-market for certain RV parts which were sold primarily to independent repair shops. When those orders were placed by those shops, delivery reliability became critical. In the manufacturing foreman's opinion (who was the only participant to point out this distinction prior to the group meeting) the order-winners were as follows:

| | |
|---|---|
| Price | 20% |
| Delivery Speed | 60% |
| Product Functionality | 20% |

Examination of company price quote sheets in fact revealed that in some cases a 100% price premium was being charged for fast delivery orders.

- Shirlon had recently formed a technical partnership team with its primary customer in the

additional data during the final group meeting. A summary is provided on the right.

custom products segment, Bombardier, a large mass-transit vehicle manufacturer. Consisting of technical staff from both sides, this working group's objective had been to synchronize parts drawings and specifications at both companies and resolve other technical issues. This special relationship, in manufacturing and design staff's view, set Bombardier apart from the rest of their customers in this segment. This aspect proved to be important during the group discussion, as will be outlined in section 4.3.7.

- In recent years, budget cuts by most municipalities have been forcing their management to be much more price sensitive in placing outside orders. This increased the importance of price as an order-winner for the future.

- The only recent capital investment by the firm has been in new molds for rotational molding. The primary reason has been to increase the company's product offering and win new customers in the RV market.

- The following comment by the manufacturing foreman during an informal conversation was revealing in terms of the diversity of demands the firm was facing: "We need to know where we are headed. High-volume/low margin production or custom-shop... 'me too' products or niche products? We are going in different directions."

- The manufacturing manager and the foreman had strong opinions about the direction the company should be taking, as can be inferred from the following statement: "We should be going after the high-end/niche markets. This is the way to wipe out competition, which has gone from three companies in the region ten years

ago to six now. We don't necessarily have the full skills [in manufacturing] today to pursue those niche markets, but we have the capability to learn."

### 4.3.7. Consensus View of Markets and Order-Winners/Qualifiers

The final group meeting took place in an informal setting. Since the facility did not have an appropriately equipped meeting room to accommodate all attendees, a section of the open-concept office area was transformed into a makeshift meeting area with no tables and a single easel. Unprofessional as it appeared, it proved to be a setting in which all participants felt at ease and the discussions were conducted in a casual atmosphere. This was evidenced by the rather comfortable manner in which some participants disagreed with the owner's opinions at various times during the meeting.

Overall, the group discussion allowed all participants to first see the combined results of individual interviews, hear a summary of other evidence collected by the researcher, and debate the order-winners and qualifiers for each market segment. Consensus was in fact reached at the end of the meeting; and the result is

As the table shows, the consensus revealed a diverse set of markets. Although the initial four market definitions remained intact in the general sense, the participants further subdivided those segments, presenting a more diverse set of markets than initially thought. A closer look at table-4.6 indicates that certain sub-groups within a general market segment exhibit significantly different characteristics from each other. For example, within the home & garden segment, existing customers of garden hose impose a set of demands that are significantly different from those required by other lawn & garden products. Similarly, although the municipal products won their orders solely on the firm's ability to design the unique products the townships required, due to the anticipated budget cuts by the municipalities, price was expected to be almost as important in the near future.

Therefore it would be logical to state that the initial market segmentation was not a sufficiently differentiated representation of this company's means of competing. The final consensus resulted in eight distinct segments with different sets of qualifiers and order-winners.

At the end of the group meeting the participants expressed their satisfaction with the outcome, as well as with the process. The owner indicated that the degree of market segment differentiation provided by this analysis

summarized in table-4.6.

would help him to better target his marketing efforts. On the manufacturing side, however, the potential benefits of this assessment were not readily apparent to the staff. Although the consensus was that this process enabled them to view their business from an angle which they could not see before, and that it highlighted the diversity of the markets they were trying to serve, they could not immediately articulate a clear course of action for manufacturing. The only suggestion came from the production manager, who stated that the company should be paying more attention to non price-sensitive markets and growing the business in those segments, although he did not articulate an appropriate manufacturing strategy to achieve it.

The production manager's enthusiasm in discussing those points was matched by the extrusion manager's. After the group meeting was completed and other participants left, those two individuals remained with the researcher and the owner and tried to obtain more information about manufacturing strategy content issues and probed the researcher on the approaches the other companies in the study were taking.

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## 4.4. CASE C – MOTT MANUFACTURING LTD.

### 4.4.1. Company Overview

Mott is a manufacturer of steel laboratory furniture (cabinetry, fume-hoods, etc..), case-goods, steel kitchen cabinetry, and custom stainless steel (SST) goods, with a single plant in Brantford, Ontario. It employs approximately 60 people, with sales of $6.2MM (in fiscal '95). Privately owned, it is currently managed by a non-owner president.

The firm has been in business for approximately 30 years, with 86% of its '95 sales coming from a single customer, Norlab—a large Canadian laboratory equipment supplier. Mott represents about 40% of Norlab's purchases, thus being a key supplier to them. The relationship with Norlab has been intermeshed over the years to a degree that Mott has been acting as the sole manufacturer for most of the case-goods Norlab supplies. Consequently, no major marketing effort by Mott has been extended for those products until recently, when the company decided to explore other markets to increase sales.

The company defines itself as "designer and manufacturer of quality steel case-goods, custom SST case-goods and components, and fume-hoods." It claims to have "market-leading *cycle times* and excellent *on-time delivery* performance." Their written marketing plan includes the following statement: "... we must remain focused on what we do best. The products must include some value-added characteristics; we are <u>not</u> interested in low price commodity products."

Mott has aggressive sales growth targets: 21% (to $7.5MM) for '96 and more than double its '95 volume (to $15.0MM) for year 2000. Part of this target is to reduce Norlab's contribution to 80% of total sales in 96, and to 65% by 2000. To achieve this, the company is planning to develop a *proprietary* product whose marketing *they* (rather than the customer) would control, with targeted sales of ~$1.7MM by 2000.

A typical cabinet fabrication process consists of the following steps:
*shearing* - steel sheets of different gauge are cut to size; *punching* - cut pieces are notched on single or turret punch-presses for easy and precise breaking; *breaking* – parts are "folded" to pre-determined shapes; *metal finishing*; *welding*; *painting*; and *final assembly,* where various hardware are attached to the basic unit, and production completed.

Stainless steel production, on the other hand, is simpler. The parts go through only *shearing*, *welding*, and *metal finishing* steps.

The shop floor utilizes a process layout, with like-equipment being close together. Parts move from one single process step to the next in batches. The only deviation from this are the two partial cells recently formed to accommodate the high-volume parts (cabinet doors and door frames). Each cell contains a punch press and a break press, utilizing a single operator who performs both operations.

| Process Step Outcomes | Analysis |
|---|---|
| **4.4.2. Study Participants** | |
| The primary contact in the company was the president, a young and dynamic engineer who had worked in several distinctly different industries, in capacities ranging from staff engineer in a power utility to director of operations at a furniture manufacturer. Eager to involve his management team in this business review, the president, who also headed the marketing function, decided to include all of his direct reports in the study. The following list outlines the participants and their functions.<br>• President (Marketing)<br>• Sales Manager (Sales)<br>• Engineering Manager (Design and Manufacturing Engineering)<br>• Production Manager (Manufacturing, Quality)<br>• Comptroller (Operations Accounting and Finance) | The president had been hired approximately two years ago by the company's now inactive owners with the intention, in his words, "...to implement professional management methods and put the 'sleepy' company on a growth path." Having worked mostly for large corporations with well structured functional areas and established management methods, procedures and policies, he saw the opportunity to make his mark in this small, old, and stagnant company in which he saw considerable potential.<br>This study was seen by this top executive as a good opportunity to conduct a review of the business from a new angle, make his staff feel as part of a team, and, in the process, educate them. |
| **4.4.3. Selection of Criteria** | |
| The master list of criteria shown in section 2.3.3 was first reviewed by the president. Following clarification of several criteria definitions by the researcher, the following list was jointly put together: | This set of criteria was constructed totally from the master list with no changes or creation of new criteria at this stage of the process. However, this changed in later stages, as is outlined below. |

- Price
- Delivery speed
- Delivery reliability
- Quality conformance
- Technical support
- Existing supplier status
- Product range
- Demand fluctuation flexibility
- Design quality

### 4.4.4. Initial Market/Product-line Segments

The president was asked to describe the company's markets, products, and customers. He was then asked to group its products to however many segments he deemed necessary. Those discussions resulted in the identification of four primary customer groups, which were treated as market segments.

- *Norlab* – steel cabinets, fume-hoods, and some SST fabricated parts made specifically for Norlab's customers (~86% of sales).
- *Other Major OEMs* – other cabinetry, shelving, work benches and workstations sold to some large customers (~11% of sales).
- *Minor OEMs* – SST components for food-store refrigeration units, sold primarily to one small secondary

Norlab had been Mott's largest customer for more than a decade. The president of the company considered this over-dependence on a single customer as a potential vulnerability and thus intended to reduce the proportion of sales generated by Norlab in the coming years. He planned to achieve this by increasing sales in the "other major OEMs" category (mostly in the United States), and by more aggressively pursuing the "proprietary products" segment, which required more active product development and marketing.

The president was aware of the new skills required in the company to achieve these goals and intended to fill the gap mostly by involving himself closely in those two functions.

manufacturer (~2% of sales).

- *Mott Proprietary Products* – steel kitchen cabinetry sold to overseas construction companies (~1% of sales).

### 4.4.5. Summary of Individual Responses

Individual, structured interviews conducted with each participant resulted in a variety of responses. Although the market segmentation initially laid out by the president remained intact, some of the participants suggested changes to some of the criteria. Table-4.7 is a compilation of all responses.

A comparison of the set of criteria shown in table-4.7 and the set used at the start of the study (listed in section 4.4.3) reveals three changes. "Design quality" was changed to "unique design capability" (ability to create designs that cannot be found on catalogs), "demand fluctuation flexibility" was replaced by "volume flexibility" (ability to fulfill orders of varying sizes without lead-time implications), "product range" was dropped altogether, and "product development cycle time" (having lead-times shorter than competition for developing new products) was added. It is interesting to note that although the renamed criterion "unique design capability" was used by several managers as either a qualifier or an order winner, the other two new criteria, volume flexibility and product development cycle time, suggested by the president during the structured interview, were not used by any participant other than the president himself.

The diversity of responses observed in this case is consistent with the earlier two cases. Again, as in case B, the differences were not confined to the weights assigned to specific order-winners; disagreements also surfaced on the nature of some criteria, i.e., order-winner

versus qualifier. A closer look at the existing supplier criterion in the Norlab segment reveals the full spectrum of views—from no weight assigned by the president and the engineering manager, to 100% by the sales manager, to being labeled as a qualifier by the comptroller.

On the other hand, there was some degree of agreement on delivery speed as an order-winner for the "minor OEMs" segment, although the views on its importance still ranged between 15 to 100 percent.

**4.4.6. Data from Other Sources**

Although a small company (and contrary to case B), the firm had relatively more documentation. A primary source was the quarterly management reports. Instituted and written by the president as a formal communication vehicle with the owners, it was a detailed account of sales, financial, and operational performance of the firm.

Among other data sources were annual business plans, inter-departmental memoranda, product catalogs, written communications to employees, shop floor measurement charts and long-range strategic plans. As in other cases, unstructured discussions with participants and other employees also took place.

- During the individual interviews, the participants highlighted the prevalence of a long-term relationship with Norlab (their largest customer), and the importance of that level of trust in continuing to win orders from them. In fact, examination of historical sales records and future sales projections confirmed a steady growth in absolute terms (although the company intended to reduce Norlab's share of total sales in the coming years). However, prior to the new president's arrival, Mott's relationship with this customer had been deteriorating. According to one of the management reports prepared for the owners, "the relationship with Norlab had been characterized with lack of trust and even animosity." This somehow contradicted the singularly positive comments received from participants earlier.

- The latest marketing plan contained the statement "...we are not interested in low price commodity products." However, in three of the four market segments "price" was rated highly by most participants.

- Although largest two of the firm's secondary customers resold a large portion of Mott's products in the United States (mostly in niche markets), Norlab has not been successful in penetrating that market. Written reports on prior customer-supplier meetings indicated that Norlab lost several bids in the U.S. largely due to price differential (approx. 20 percentage points). Mott's internal assessments attributed this difference to Norlab's higher mark-ups. This may indicate that Mott's prices are competitive, and that the firm may be able to directly bid for jobs in the U.S. However to avoid offending their largest customer, the firm has stayed away from such a move.

- Examination of the company's latest capital investment plan revealed that the amount put aside for manufacturing improvements was insignificant. Of the $150,000 capital budget for fiscal 1996, the breakdown of investments were as follows:

| | |
|---|---|
| . Computer hardware and software | 42% |
| . Building and office furniture | 7% |
| . Production tooling for new products | 38% |
| . Equipment repairs and new equipment | 13% |

- A previously installed automated welding machine was recently removed from production. It had been purchased to increase throughput speed and reduce direct labor. However the firm soon realized that a necessary element of such investments was high volume, as characterized in the following statement in a management report on key achievements of the previous year: "We currently are not a high-volume business of

standard components..."

- The company's largest customer in the "other major OEMs" segment has been increasing their business with Mott, especially for the orders being shipped to customers in the U.S. Examination of a quarterly management report stated the reason for the increased business "...our quality, and our delivery reliability." Yet majority of the individual views include price and unique design capability as important order winners (table-4.7).

### 4.4.7. Consensus View of Markets and Order-Winners/Qualifiers

The group meeting included all of the study participants and was facilitated by the researcher. A summary of individual assessments, which was a graphical version of table-4.7 without the function titles, as well as a compilation of other evidence collected by the researcher, were shown during the meeting. After extensive debate, and modification of some of the criteria (renaming, combination, additions, and deletions—see table-4.8) the discussion centered around the role of dealers, brokers, and resellers which formed a substantial majority of the firm's direct customers (customers that were not the end users of its products). This focus on the intermediaries, as well as their

The company's largest customer, with a share of 86% of current year's sales, Norlab, supplied exclusively the Canadian laboratory furniture market. Its attempts to enter the U.S. market had been unsuccessful, primarily due to fierce price competition. Being aware of this, Mott had started to work directly with dealers in the United States, without appearing to be disloyal to Norlab. Therefore the participants identified the U.S. lab furniture market as a separate segment. However, as can be seen in table-4.8, the weightings subsequently assigned to both segments turned out to be the same.

Among Mott's remaining customers, Hussman, representing only 2% of total sales, was seen as a separate segment for several reasons. It was a secondary manufacturer of SST products that bought certain difficult-to-make components from Mott. Those orders were won by Mott solely on fast and reliable delivery. Furthermore, this part of Mott's production was the only

reevaluation of the market segments, led to a final assessment which looked significantly different from the overall appearance of the individual assessments, as discussed on the right.

part which did not go to an intermediary for resale. Consequently, as can be seen in table-4.8, Hussman was differentiated from the rest of the market segments.

The substantial difference between the consensus view and the individual views in this case is striking. The management group seemed to have realized, during the group meeting, that in most cases, Mott did not even come in-contact with the final customer of its products. The firm did not bid on the jobs directly, but its immediate customer did (e.g., Norlab). In most cases those dealers/resellers did not ask for competitive quotes from other manufacturers, but simply passed on the orders and product specifications to Mott. The dealers' prior experience with the company, and their familiarity with its pricing policies and capabilities, enabled Mott to qualify as the sole manufacturer. The management group's conclusion, after extensive debate, was that the dealers' and resellers' ability to secure orders from their customers was the sole determinant of Mott's winning the orders.

Contrary to other cases, in case C, the participants appeared to be subdued at the conclusion of the group meeting. Although they were relatively "charged up" during the individual interviews and most of the group meeting, the realization of their apparent total dependence on the dealers for winning orders may have dampened their enthusiasm. Another reason for the loss of energy may have been a result of the president's tendency to dominate the group discussions. Although consensus was reached at the end, this may have been due to the other participants' yielding to their superior's

opinions. More details on these tendencies in this and other cases will be covered in the Discussion section, chapter 5.

## 4.5. Case D - BDH Chemicals

### 4.5.1. Company Overview

BDH is a manufacturer and supplier of compounding ingredients, testing chemicals and reagents, and a limited range of finished pharmaceuticals to pharmacies, hospitals and testing/research labs. As part of the world-wide E. Merck, Darmstadt, Germany group, it is headquartered in Toronto, a site which includes a manufacturing plant, with offices in Montreal and Vancouver. Its 1995 sales were $28 MM., and it employed approximately 130 people.

The company operates as three marketing and sales divisions: *health care*, *laboratory chemicals*, and *industrial*, with approximately $5, $12, and $11 million in sales volume respectively. The manufacturing plant handles only the products from the first two businesses; the industrial products are imported from the parent company in Germany, and distributed in Canada.

The manufacturing processes consist of dry blending, solid-in-liquid and liquid-in-liquid mixing, powder and liquid filling and packing. Batch sizes vary between 100 milliliters and 4,700 liters. Majority of products are made to stock, except customized solutions which are mixed to customers' specifications, and made to order. Some of the custom preparations are repeat orders from a specific customer, and some are formulated in the development lab based on the customer's specified needs.

| Process Step Outcomes | Analysis |
|---|---|
| **4.5.2. Study Participants** | |
| The primary contact in the firm was the general manager (GM). His direct responsibilities included operations, quality assurance, regulatory affairs, | Three individuals from the management staff were excluded from the study. The GM considered the positions of the information manager and human resources manager as not directly relevant in the |

information management, accounting, and human resources. The marketing and sales functions reported to a vice-president in the United States, with dotted-line responsibility to this general manager in Toronto. The study participants were selected by the GM based on their position's relevance for the study and the individual manager's seasoning on the job. A list of the participants and the functions they represented are shown below.

- General Manager (General Management)
- Sales Manager, Laboratory (Sales—laboratory reagents)
- Marketing & Sales Mgr., Healthcare (Marketing/Sales—healthcare products)
- Product Manager, Dry Chem. (Marketing—laboratory, dry chemicals)
- Product Manager, Solutions (Marketing—laboratory, solutions)
- Production Manager (Manufacturing)
- Logistics Manager (Inventory Control; Distribution)
- Comptroller (Operations Accounting and Finance

formulation of an operations strategy. He also kept the manager of quality assurance out of the list of participants because she had been brought into the position from outside the company only recently and consequently did not have sufficient knowledge of the firm's business.

As in other cases, the views of marketing and sales managers in this firm were recorded only for the products/market segments/customer types they represented (exceptions were the firms that had a single marketing or sales manager representing all products).

### 4.5.3. Selection of Criteria

The general manager evaluated the master list of criteria shown in section 2.3.3 and asked for clarifications on several terms and concepts. He then scanned the list for applicability to the firm's products and markets and selected the following subset for use in the individual assessments.

- Price
- Delivery speed
- Delivery reliability
- Quality conformance
- Technical Support
- Existing supplier status
- Product range
- Volume flexibility
- Product development ability

The list included one criterion which was not in the master list—product development ability. The GM suggested this criterion specifically for the industrial customers in the laboratory chemicals market. In his view, the company's ability to develop specialized products for specific customers was an important factor in winning orders in that segment. As will be seen later, this criterion was used only by one other participant and received low weights.

### 4.5.4. Initial Market/Product-line Segments

The market/product segmentation done by the general manager followed a scheme identical to the company divisions as summarized below.

- *Health Care Market* – prescription and assistive products in areas such as topical anesthesia, physiotherapy and respiratory therapy (~18% of sales). It consists of two segments.
  - Pharma segment: prescription

Since the purpose of identifying the qualifiers and order-winners for BDH was to eventually develop a meaningful manufacturing strategy, and given the fact that the products for the industrial chemicals market were not manufactured by the company (imported from U.S. and overseas), the decision was made to exclude the segment form the study.

The remaining segments were used as the starting point in all individual assessments. However, the participants modified this segmentation scheme in

products sold to hospitals, wholesalers and pharmacies.
- Haemodialysis segment: standard and custom solution preparations for kidney dialysis units in specialized hospitals.

- *Laboratory Chemicals Market* – various reagents (salts, acids, solvents) used in laboratories, sold to three major classes of customers (~42% of sales):
  - Industrial customers (laboratories in private sector companies),
  - Clinical customers (private clinical labs and hospitals),
  - Educational customers (universities).

- *Industrial Chemicals Market* – chemicals used in industrial processes (~40% of sales). This division's products are 100% traded, i.e., none of them is manufactured by BDH.

### 4.5.5. Summary of Individual Responses

Individual, structured interviews with participants were aimed to capture their assessment of the firm's qualifying and different ways, as will be shown later.

The health care products segment, although centered around product types, was divided along both product and customer types (table-4.9a); and the same sub-

order-winning criteria for each of the product groups or market segments. Discussions started with the segmentation articulated by the general manager (summarized above), however not all managers adhered to it. Of the two major segments included in the study, laboratory chemicals exhibited a higher variability among the participants in terms of the sub-segmentations that were suggested.

segmentation was used by all participants. In terms of qualifiers and order-winners, although there was an overall agreement on the importance of price and delivery reliability as primary order-winners, variability was still observed among the functional heads. For example, in the Pharma-Hospital sub-segment, delivery reliability received weights of zero and 50%, as well as being considered a "Q" (qualifier) and a "QQ" (order-losing-sensitive qualifier). Various other criteria were assessed as either not important (0%), or as a qualifier.

Usage of some criteria also varied. While volume flexibility and product development ability were not used by any participant, quality conformance was renamed as quality/regulatory conformance, reflecting the highly regulated nature of this segment.

The assessment of the laboratory chemicals segment proved more troublesome. Whereas some participants sub-segmented this market by product type (dry or solutions; custom or stock), others used customer type as the primary (industrial, clinical, or educational), and product type as the basis for the secondary sub-grouping (staining solutions or others). The results are shown in separate tables (table-4.9b and table-4.9c).

According to the first sub-segmentation scheme (by product type—table-4.9b), price, again, was the widely accepted dominant criterion, although a higher number of the other criteria received moderately higher weights than in the health care market. Variation among the managers was also apparent. In terms of criteria modifications, product development ability was replaced by ability to customize by one participant in the custom

solutions sub-segment.

The second grouping scheme (shown in table-4.9c) was a hierarchical combination of customer and product types. Adding to the complexity in this segment was the sales manager's assessment of the criteria for industrial customers in terms of current and future (plus two years) positions. Examination of the mean weights indicates a broader distribution among the criteria, which can be traced to the general manager's responses. He, more so than with other segments, and than other participants, spread the weight among a larger number of criteria.

### 4.5.6. Data from Other Sources

The primary sources of additional information were the unstructured parts of individual interviews, monthly management reports—a very detailed and structured account of previous month's activities and performance measures—and product catalogs and price lists.

Discussions during the individual, structured interviews were particularly useful in this case. Although most participants appeared to be guarded and cautious at first, as the interview progressed, all of them became more open and started to volunteer information related to specific market segments and the company overall. In most cases, the participants offered

- In the haemodialysis market, some hospitals had started buying the products in powder form and making the solutions, in the formulations required, and as needed, in-house. The practice had been spreading slowly, and BDH's market share had been declining because the firm did not offer powdered versions of those products. In order to reverse this trend, the product development capability has to be improved in that area. This point was not reflected in the assessment of the qualifiers and order-winners.

- In the same market, a common practice is that hospitals ask for bids from suppliers every year, and select the lowest bidding few of them which can supply the range of products required. During the year, hospitals place individual orders with those pre-selected suppliers based on criteria other than price, such as ability to provide a specific formulation, speed of

significant information to support their quantitative assessments of specific markets. These revelations came not only in the form of personal statements, but, in most cases, the participants pointed to internal or external documentation (shown to the researcher but not given a copy).

Relevant parts of the data collected by these means have been summarized on the right.

delivery, etc. Based on these facts, price appears to be a qualifier, and ability to customize and/or delivery speed order-winners. However, the assessments were not consistent with this thinking.

- In the laboratory chemicals segment, BDH has recently entered a new agreement with a lab supplies distributor, VWR (partially owned by its U.S. parent company, Merck), to distribute all of its products in this segment. BDH no longer takes orders directly from, or ship directly to, its customers. This has the potential to alter the way in which BDH wins orders. This point was not reflected in the individual assessments, however, it was factored in at the final group meeting.

- The company's employee compensation package includes a bonus system for all non-managerial employees (approx. 75% of the total headcount). This elaborate system grants cash awards to those employees based on the achievement of a combination of various performance measures. Its calculation is weighted in favor of speed and reliability of deliveries. The plan also places more emphasis on the achievement of profit targets than on reaching sales objectives. This scheme, although consistent with majority of individual assessments in terms of the importance of delivery, does not have a corresponding emphasis on product costs—an important factor in price-sensitive markets.

### 4.5.7. Consensus View of Markets and Order-Winners/Qualifiers

The final group meeting included all participants, as well as the U.S.

The initial broad segmentation of the two primary markets in which the firm operates remained intact at the

corporate vice president responsible for the Toronto division—the BDH general manager's superior. He was visiting the facility on the day of the group meeting, and after hearing about the nature of the research, asked to be included in the discussions. The general manager could not refuse this request and informed the researcher that the vice president would also attend. Although this had the potential to influence the participants' conduct during the meeting and consequently bias the results, the postponement of the meeting would have created an uncomfortable situation for the general manager as well as present difficulties with rescheduling (the meeting had taken two months to arrange).

Given the fact that the vice president had been the general manager in that facility for about a decade prior to being promoted to corporate headquarters two years before, the decision was made to proceed with the group discussion. The general manager indicated to the researcher that he was confident that the participants would feel comfortable in the presence of the vice president—a prediction that turned out to be correct.

end of the group discussion. The health care products segment was deemed to have two sub-groups, pharmaceutical and haemodialysis, as with the individual assessments, although the criteria attributed to them were not significantly different from each other (table-4.10).

The sub segmentation of the laboratory chemicals market, however, was different from all of the schemes previously offered by individual participants. Customized solutions were expectedly differentiated from the rest of the products, with further differentiation between the existing customers of those products and new customers the firm was trying to attract. The primary order-winner in both of the these sub-groups was deemed to be VWR representatives' skills in promoting BDH products and its capability to customize formulations. This distribution company, as highlighted in the previous section, had started to play a major role in BDH's efforts to expand its presence. The sales representatives' success in securing new orders, partially through the broad range of laboratory supplies they provided, had become a key factor for BDH to increase sales.

Another significant difference between the group consensus and individual assessments was the realization that brand name—a criterion not brought up earlier—played a role in the company's ability to win orders in the stock chemicals. The participants decided that that group of chemicals consisted of four sub-segments with moderate differences among them in terms of the importance of various criteria. As can be

The meeting opened with a short review of the basic concepts and the methodology used in the study, which was followed by the summary of the individual assessments of the qualifiers and order-winners. The different sub-segmentations of the laboratory chemicals market, as well as points outlined in the previous section were also presented by the researcher. Each market was debated in turn by the participants, and a consensus was reached, as illustrated in table-4.10.

seen in table-4.10, the group exhibits a distinct set of characteristics relative to the rest of the segments.

The overall feedback received from the group at the end of the discussions was positive. The type of multifunctional forum the meeting had provided was apparently unusual for the managers. Although the group had come together in other occasions, the type of business issues debated in the final meeting had not been discussed in the past. In relating that view to one of the marketing managers prior to adjournment, the production manager remarked: "This is the type of information we should be getting from you people, instead of those dry marketing plans you simply pass on to us once a year." He also suggested to the rest of the non-marketing/sales managers that they reconvene in the near future and identify what those sets of criteria meant for the manufacturing function.

The corporate vice president, who only attended the final group meeting, invited the researcher to conduct a similar review in another of his divisions in the United States, which the researcher could not accept due to time constraints.

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## 4.6. Case E - McNeil Consumer Products Company

### 4.6.1. Company Overview

The firm (MCPC-US) is the over-the-counter drug sales and manufacturing unit of Johnson & Johnson, a U.S.-based multinational health care company. The company was acquired from its founder in early-fifties, and operated as a prescription drug unit until the early-seventies, when its flagship brand, Tylenol, a popular pain-killer/fever reducer, was approved by the Food and Drug

Administration for sale over the counter. This switch allowed the corporation to spin off the marketing/sales of the OTC version as a separate business unit. Separation of manufacturing followed shortly thereafter. The brand steadily increased its sales during the following years, prompting the construction of a second manufacturing plant in Texas in late-seventies, and a third in Puerto Rico in mid-eighties, in addition to the head office plant in Pennsylvania.

Growth in sales and market share came not only from the increases in the base product, but to a large extent from the introduction of several derivatives in related indication categories (e.g., sinus, allergy, cold and flu), and age groups (infants, children, adult) using the same brand name. Although the active ingredients in all those products and the pharmaceutical technologies used to manufacture them are available to all manufacturers, McNeil's products are sold as the premium brands in their categories, at 40-100% price premium over their store brand competitors.

The highly competitive nature of the consumer segment and the premium brand name status of the company's products mean that extensive marketing and sales programs are needed to differentiate the company and its products. Among those mostly utilized are: seasonal trade and consumer promotions, print and television advertising, physician and pharmacist detailing, distribution of product samples to physicians and consumers, direct- and target-mail marketing, and providing various value-added services such as shelf-management and advertising displays to the trade customers.

Manufacturing of the dosage forms involves two main stages: processing, and packaging. It utilizes mostly standard technologies using off-the-shelf equipment built to modified specifications. Process stages are similar to those described in case A (section 4.2.1).

| Process Step Outcomes | Analysis |
|---|---|
| **4.6.2. Study Participants** | |
| The researcher was an employee in the firm during the time the study was conducted. Although the vice president of operations acted as the sponsor for the project (the study results were subsequently used in developing a new operations strategy for the company), | The selection of the participants in this case proved somewhat problematic. The abundance of functional managers/directors as potential participants—a direct result of the size of the company—presented a challenge. During a meeting between the researcher and the vice president of operations, the advantages of an all-inclusive participation (more buy-in, opportunity for |

most of the stages of the study was conducted without the mediation of such a high-ranking officer.

The core group of participants consisted of the following 21 individuals (in cases which involved more than one participant with the same title, the number of individuals are shown as "X#").

- Product Directors (Marketing; organized around brands or products)X9
- Group Product Directors (Marketing; overseeing groups of brands)X3
- Operations Business Managers (Operations; with multifunctional coordination responsibilities focused on groups of brands)X5
- Director of National Planning (Production Planning, Inventory Control, Resource Planning)
- Plant Manager (Production)
- Director of Sales Promotions (Sales; trade promotion management)
- National Account Director (Sales; trade-account management)

training) were weighed against those of selecting a limited set of participants (quicker results, more manageable data set). Another consideration during the same meeting was the political implications of excluding certain managers. As a result of the participative management style the firm utilized, the individuals in the operations management group were accustomed to be included in all such multifunctional activities. Following further discussions with the researcher, the vice president offered a compromise solution: a comprehensive list of managers and directors were to be included in the structured interviews, however the responses of only a subset, considered as the "core group" (listed on the left), were to be tabulated and presented in the final group meeting.

The titles of the 10 additional directors were as follows:

- Director of Purchasing,
- Director of Planning Systems
- Director of Engineering,
- Director of Market Research
- Director of Contract Manufacturing,
- Director of Strategic Promotions
- Director of New Products,
- International Marketing Directors X3

### 4.6.3. Selection of Criteria

The list selected by the v.p. of operations and the researcher as the starting point during the structured

The number of criteria selected for consideration in this case was higher than in all the previous cases (twelve versus eight to nine). Apart from the five generic

interviews and in the survey form consisted of the following criteria.

- Price
- Delivery – Speed
- Delivery – Reliability
- Quality Conformance
- Product Innovation
- Broad Product-Range
- Value-added Features/Services
- New Product Time-to-Market
- Product Performance
- Package Leadership
- Trade Relations
- Brand Image

criteria (cost, quality, etc.), six other, more descriptive factors from the master list, and one suggested by the vice president (value-added features and services) comprised the set.

### 4.6.4. Initial Market/Product-line Segments

The firm's marketing function uses a brand management approach in its organization. Major brands (e.g., Tylenol, Imodium) and their sub-segments (e.g., children's, adult, etc.) are managed by product directors (PD). The brands are then grouped in terms of their similarities in their marketing programs (e.g., adult pain-killers, seasonal brands, etc.) and managed by group product directors (GPD). This product focus in the organization led to a natural initial segmentation based on brands/products, as shown below.

The existence of the brand management structure made the initial market/product segmentation easy. There was no discussion on how the products or markets should be grouped for the purposes of the study. This is consistent with the market-based (external) focus of the assessment process. Although following the consensus at the end of the group discussion some of the brands listed on the left were grouped based on the similarity of the their qualifiers and order-winners, this segmentation helped the individual assessment process (i.e., product directors assessing their own brands).

- Adult Tylenol (43% of sales)
- Tylenol Sinus (7%)
- Tylenol PM (9%)
- Tylenol Allergy-Sinus (6%)
- Children's Tylenol (11%)
- Children's Tylenol Cold (3%)
- Children's Motrin (8%)
- Imodium (4%)
- Tylenol Cold&Flu (7%)
- Lactaid (2%)

### 4.6.5. Summary of Individual Responses

Organizing 31 interviews was one of the more difficult parts of this case. Although the researcher's availability at the site (as an employee) was, naturally, an advantage, coordination of all the interviews still proved to be challenging and lengthy—spanning approximately 10 weeks. Due to the unpredictability of the managers' daily schedules, many of the appointments had to be rescheduled, some more than once. Participants were all university graduates, and most with graduate degrees—typically MBA. Although the concepts of qualifiers and order-winners was new to them, none had difficulty working through the process.

The interviews resulted in the Examination of tables-4.11a and 4.11b reveals a mixed level of agreement among the participants on the importance of qualifiers and order-winners. Relatively higher degrees of agreement can be seen for certain brands (e.g., Adult Tylenol), and also on some criteria across the brands (e.g., delivery speed/reliability, quality conformance, package leadership). A wider range of views, however, is more apparent for criteria such as product performance, value-added features, and price.

The initial segmentation of the markets along the product lines remained intact during the individual interviews with all participants except the National Account Director—the highest-ranking sales executive in the group. As the discussions progressed on the relative ranking of order-winners for the market segments initially presented, the director indicated that, in her opinion, the criteria differed more by class-of-trade than by product. She then proceeded to classify

generation of a set of functional views as summarized in tables-4.11a and 4.11b.

The criteria used throughout the interviews remained mostly intact (no changes were suggested by the participants at this stage of the study, with the exception of the National Account Director, as discussed on the right). One criterion was added by the National Planning Director: "professional endorsement," intended to highlight physicians' influence on end-users' choice of products.

the four primary groups of trade customers (mass merchandisers/food-store and drug-store chains; independent wholesalers; warehouse clubs; and, others). The resulting rating of order-winners and qualifiers for those customers are shown in table-4.11c.

The differences in the relative importance of the criteria between this segmentation and the product-based segmentation used by all the other participants are significant. The first is the obvious difference between the groupings, i.e., the presumed uniqueness of brands/products versus of the trade customers. In the sales director's opinion, products qualify and win orders on the basis of who buys the product directly from the firm (trade customers), and not on the basis of what the product's intended use is (type of symptom relieved, i.e., product name). The logic of this classification clearly stems from the sales function's focus on the direct customer, as opposed to a marketing manager's focus on the product (and ultimately the end-user it targets).

The second difference in the sales director's assessment was the weights attributed to various criteria. Although criteria such as delivery speed and reliability received assessments similar to those by other participants using product-based segmentation, the importance of other criteria, such as ability to customize various aspects of the products, was more prominent. In fact, two of those highly-rated criteria related to customization were added by this participant, who also modified another criterion, trade relations.

This issue of varying segmentations and their impact on order-winner/qualifier assessments is

discussed in more detail in chapter 5.

### 4.6.6. Data from Other Sources

Collection of complementary data for triangulation purposes was relatively easy and sources plentiful. Access to company documents and employees was made easy by the open and friendly attitude of almost all participants.

Among the mostly used documents were current and historical company strategic plans, brand marketing plans, annual sales reports, departmental (operations) annual business plans, bi-monthly market-share data, product standard-cost sheets, manufacturing cost performance reports, monthly customer-service and inventory reports, inter-office and operating unit-corporate parent memoranda, as well as articles about the corporation in business publications.

Supplementing the written-form were unstructured discussions with some operations managers, production supervisors, and lower level sales and marketing employees, as well as observations on the plant-floor.

The abundance of written data sources and virtually unlimited access enjoyed by the researcher in this case

- Package superiority was first included in the list of criteria by the operations participants because of its perceived importance. This perception was based on previous attempts by the marketing function to bolster the image of the brand by changing and improving packaging. Examination of marketing plans and company memoranda revealed an emphasis on packaging as an implied order-winner. One of the memoranda from the company president read as follows: "...lack of news for this brand got me to think about packaging opportunities. What can we do with the package to boost it?" As a result, a team of packaging engineers had been formed to design and build prototypes for a drastically new packaging concept for the existing products.

However, during the individual interviews, when definitions of qualifiers and order-winners were given, a large majority of participants assessed package superiority either as a qualifier or as not relevant. There was agreement among the participants that it was the product inside the packaging that should be marketed, not the package. However, the package had to meet basic minimum requirements, such as having child-resistant and temper-evident features, easy-to-read labeling, etc. Failure to provide those properties in a consistent manner could seriously erode consumer confidence and jeopardize sales. These characteristics

allowed additional data analysis (e.g., compilation and representation of historical market and company data), which improved the presentation of triangulated data at the final group meetings.

pointed to packaging as an "order-losing-sensitive qualifier."

- One important element of the firm's operations strategy in the past has been inventory levels. It is prominently featured in each year's operations business plans, emphasized in monthly performance reports, and precisely measured and reported. It is the one operations performance measure which, other than line-item-fill rate (a measure of customer service—reliability of delivery), has the most visibility with the top executives of the company, as well as with executives of its corporate parent. It was seen as an easy way to keep the focus on and reduce costs. However, "price" as a criterion did not receive significant weightings during the individual interviews.

- Another criterion which was not emphasized during the structured interviews was "product range." The highest weight it received from any participant was 20%, with 5-10% being a more typical rating when it was assigned any weight at all. This would have indicated that most brands did not rely on offering a broad product range in their respective categories. However, examination of historical sales and production records painted a different picture. Since 1991, a large majority of end-product additions have been line-extensions—marginally different versions of a basic product. Although the overall unit volume produced by company's own three plants remained virtually flat, number of end-products (SKUs—stock-keeping-units) had increased by approximately 40%. Other statistics demonstrated that the broadening of product range had

been successful. With one exception, all brands that had increased their product offerings in the previous seven years also exhibited increased market share. The reverse was also true—two brands with a net decrease in number of SKUs also showed slightly declining market share.

More proof of the deliberate nature of the broadening of product range came from the examination of the marketing plans for one of the children's brands. In highlighting the differentiation characteristics of the brand, one statement read: "... [this brand] has the greatest variety of forms and flavors in children's category." In spite of the disclosure of the above facts, the participants did not assign high weights to broad product range.

### 4.6.7. Consensus View of Markets and Order-Winners/Qualifiers

Due to the high number of participants and abundance of product groups to be assessed, a single final group meeting was not attempted. Decision was made to convene four separate group meetings (denoted by group-I through –IV in table-4.12), based on the similarity of products to be discussed. The core-group participants (section 4.6.2) from operations and sales departments attended each session; whereas the marketing managers (product directors and group directors) were present only at those meetings which focused on the

The consensus assessment followed a product-based segmentation scheme. Interestingly, the sales executive who had offered the customer-based segmentation during the individual interview did not try to impose her scheme on other participants at the group meetings. Her comments mostly centered around the importance of meeting the trade customers' requirements; although she did not differentiate among the classes of trade. Her well-articulated reasoning for the importance of such criteria as trade services and ability to customize was met by equally well-explained facts about the importance of brand name and new-product time-to-market, put forward primarily by marketing managers. Although the debates were lively, and at times, heated,

brands/products for which they were responsible.

This arrangement proved successful as the discussions were focused, with active participation by all, at a meeting of an appropriate length (approximately two hours each) for the managers' busy schedules.

these seemingly opposing perspectives converged on a composite set of criteria representing company's entire product range (table-4.12).

As seen in the table, the 14 criteria rated during the individual interviews were compressed into 11. The main change in criteria was the convergence of three trade and customization-related market factors into one (trade services/ability to customize). Another modification made at the group meetings was the grouping of four allergy/cold/sinus-related products into one (group-I), with two sets of criteria—one for current, and one for new products.

In terms of the assessment of the criteria as qualifiers or order-winners, table-4.12 shows that the price, quality, and delivery-related generic criteria were assigned as qualifiers for all products. Similarly, three other criteria (product innovation, trade services, and brand name) were selected as primary order-winners across all brands, but with varying weights. Time-to-market was considered to be either a qualifier or an order-winner, depending on the brand, whereas broad product range, a factor highlighted by the researcher as having led to increased sales (based on data collected), received low or no weight (four of the seven brands considered it to be not relevant).

Overall, no major disagreements were observed among the final group meeting participants. The views expressed during the discussions were more about degrees of importance than complete polarization.

At the end of the meetings many participants expressed their pleasure with the process, and its

outcome. As one operations manager put it: "we are now talking the same language with those marketing guys." Another remarked: "this is a good way to show the sales and marketing people that we too understand the overall business."

In a subsequent meeting among the operations managers the consensus assessment was reviewed and its impact on operations was discussed. The managers agreed that since the criteria used were market-focused, they needed to be translated to operations terms. The debate on this translation was to be the first step towards developing an operations strategy linked to the qualifiers and order-winners of this company's products.

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This chapter provided detailed case descriptions and the related within-case analyses. The following chapter focuses on in-depth discussion of the findings and cross-case analysis within the context of the research propositions.

# Chapter 5. DISCUSSION

This section provides further in-depth analysis of the study findings by first examining the cross-case patterns within the context of the six research propositions outlined in section 2.3.1. It then examines additional issues uncovered during the course of the study which serve as reflections on the entire process and which have the potential to make further contribution to the conclusions of this research.

## 5.1. Examination of The Research Propositions

### 5.1.1. Differing Perspectives of Functional Managers on Qualifying and Order-Winning Criteria (P1)

Examination of the quantitative data summaries of individual participants' views in each case (chapter-4, and appendix-IIA) reveals a consistent pattern: *functional managers of the same company view the means of competing for their firm differently.* Although this result was anticipated based on this researcher's prior work (Menda and Dilts, 1997), the widespread nature of the phenomenon was still revealing.

Table-5.1 is a quantitative summary of the types of agreement and diversity in individual responses for each case and all cases combined. It is significant to note that in none of the instances where a criterion was rated as an order-winner by all participants did their weights agreed with each other (see note (2) in table-5.1). In only 8.4% of instances all managers who considered a criterion to be a qualifier (Q or QQ) agreed with each other. In the rest of the cases (91.6% of all instances in which participants rated a specific criterion for a given market or product line) some type of disagreement existed. In 44 instances (14.8%) a criterion was judged to be a qualifier by at least one participant, but none of the other managers considered it as an order-winner (i.e., no weights assigned). Of the remaining 228 instances, the participants disagreed whether a criterion was a qualifier or order-winner 123 times (41.4%), and disagreed on the weights to be assigned, when the criterion was considered an order-winner by all, 105 times (35.4%). These last two types of disagreements are discussed in detail below.

| | Case A | B | C | D | E | All Cases Number | % |
|---|---|---|---|---|---|---|---|
| Total agreement on criteria as Q or QQ (1) | 0 | 0 | 1 | 6 | 18 | **25** | 8.4 |
| Total agreement on weights as order-winner (2) | 0 | 0 | 0 | 0 | 0 | **0** | 0 |
| Criteria judged as Q/QQ but not as order-winner (3) | 0 | 4 | 1 | 7 | 22 | **44** | 14.8 |
| Criteria judged as Q/QQ and order-winner (4) | 0 | 23 | 19 | 36 | 45 | **123** | 41.4 |
| Criteria judged as order-winner only (5) | 15 | 6 | 9 | 19 | 56 | **105** | 35.4 |
| Totals | 15 | 33 | 30 | 78 | 141 | **297** | 100 |

**Table-5.1 Summary of the Types of Diversity in Individual Participants' Responses***

(1) This indicates the number of instances all managers rated an individual criterion for a given market or product line as a qualifier (Q or QQ)

(2) The number of instances all managers considered an individual criterion for a given market or product line as an order-winner, and assigned the same weight

(3) This signifies the number of times a given criterion was rated as a qualifier (Q or QQ) by at least one participant, but not as an order-winner by any other

(4) The number instances a criterion was considered a qualifier (Q or QQ) by at least one participant, and rated as an order-winner by at least one other

(5) This indicates the number of times a specific criterion was rated as an order-winner by at least one manager, but not considered a qualifier (Q or QQ) by any other

* Instances where a criterion received no weights and not rated as a qualifier (all zeros) not counted

The first type of diversity in perspectives could be termed as disagreements on the *nature* of the differentiation among the criteria—whether certain criteria were deemed to be qualifiers or order-winners. In most of those cases where the nature of the criteria for a given market segment was in dispute (i.e., qualifier or order-winner), those participants who considered the criteria to be order-winners assigned low (5 to 15%) weights to them. The reason for this phenomenon is not immediately apparent. One explanation could be that those managers regarded low-ranking order-winners as being conceptually similar to qualifiers. If this was the case, then the degree of disagreement among the managers on those criteria could be considered to be low. An alternative explanation is that the participants did in fact understood the distinction between qualifiers and order-winners (with the exception of case A, in which participants used only order-winners—section 4.2.5), and chose to assign low weights to those criteria. If this was the case, then the disparity in individual perspectives were still observable.

Differences of a larger magnitude were also seen in this type of disagreement. An example is the "proprietary products" segment in case C. Price was considered to be a qualifier by the sales manager, and an 80-percent order-winner by the production manager (table-4.7). In this case the disagreement can be attributed to the newness of the proprietary products to the company. The firm intended to develop a line of its own products and sell them primarily to overseas customers to reduce its dependence on its primary customer, Norlab. At the time of the individual interviews, although enthusiastic about the prospects, the company had sold only a few prototypes, and was still trying to understand the characteristics of the market. It is, then, understandable that their views on the basis of competition in that market segment had not yet "gelled." However, the same cannot be said about the "other major OEMs" segment. With 11% of sales, it represents a group of relatively older customers in an established market. Yet, price, delivery reliability, design capability, and quality, all received assessments as qualifiers and as order-winners with weights ranging from 15% to 70% (table-4.7).

This type of disagreement was not unique to case C. Both sub-segments of the pharma products market in case D received similarly conflicting assessments. In the 'retail' sub-segment, price was considered to be a qualifier by the sales and marketing manager and a 100% order-winner by the logistics manager and the comptroller (table-4.9.a). Similarly, delivery reliability in the 'hospital' sub-segment received assessments ranging from nil. to qualifier, order-losing-sensitive qualifier (QQ), and a 50% order-winner.

The second primary type of disagreement among the participants related to the *degree of importance* assigned to those criteria which were identified as order-winners. Examples of this phenomenon were observed in every case. Some of the more pronounced differences were seen in the Norlab segment in case C (table-4.7). The weights assigned to price and existing supplier spanned the entire spectrum (0 to 100 percent); and wide distribution of weights were common for other criteria in that and other segments.

The range of disagreements for each case, and all cases combined, are illustrated in figure-5.1. The histograms have been constructed by plotting the frequency distribution for response ranges (i.e., the difference in weights between the highest and lowest response for each criterion per market segment; for instances in which a criterion was considered a qualifier and order-winner by different participants, a Q or QQ was considered to have a weight of zero for this purpose).

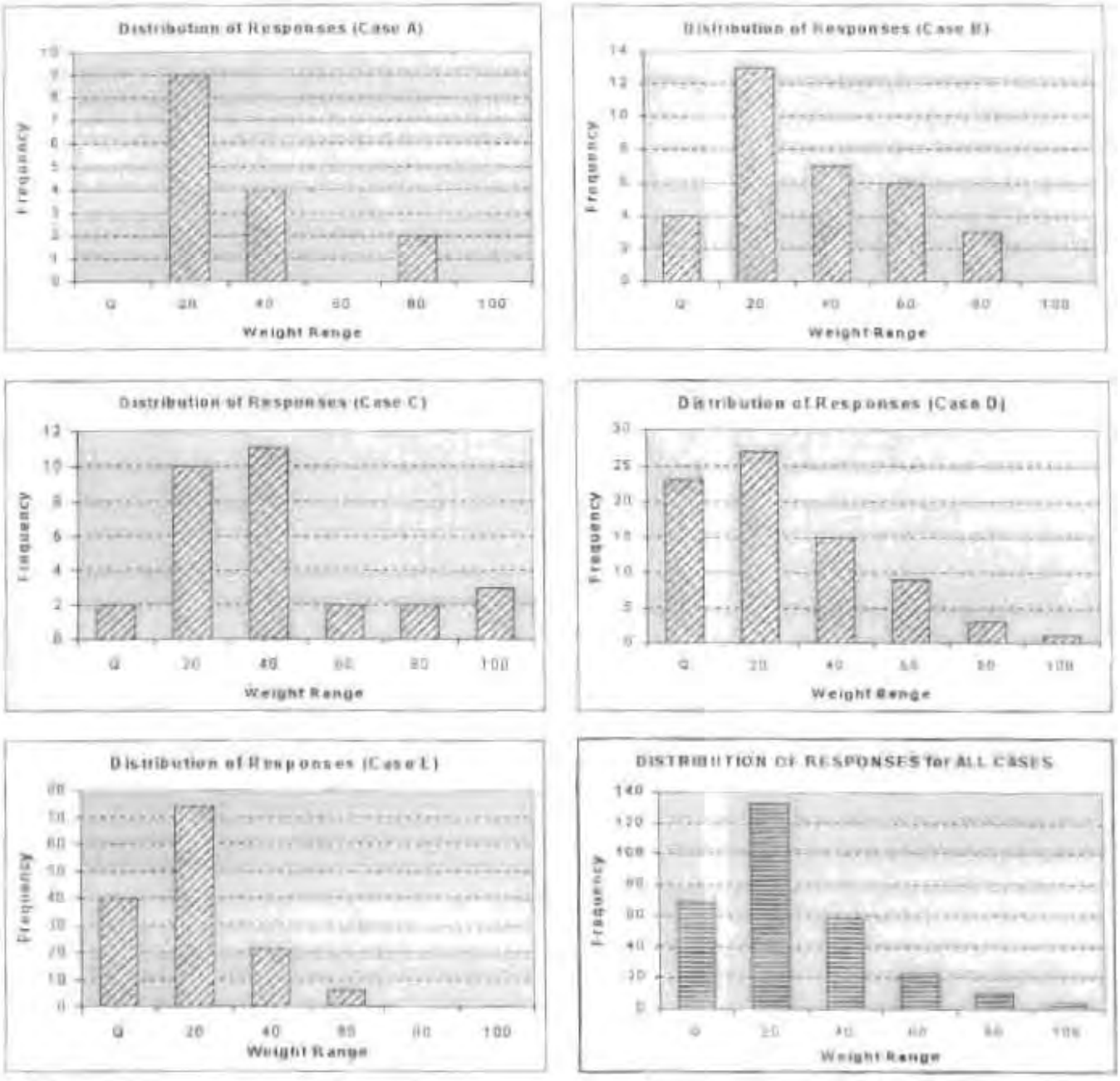


**Figure-5.1 Distribution of the Extent of Response Diversity**

Weight Range – difference between highest and lowest weight assigned to a criterion
"Q" – signifies the instances in which the criterion was considered a qualifier by at least one participant, but no weight assigned by any other (weight range in those instances was considered to be zero).
Frequency – signifies the number of instances for each case and all cases combined.

All cases demonstrate a wide range of response disparity, with cases C and D spanning the entire spectrum of ranges (0 to 100), and case E exhibiting the narrowest spread of all. Combined statistics indicate that although the most common range was 20 points or lower, in approximately one third of the instances (95) participants' weights varied by more than 40 points.

The pervasiveness of the disparity in functional managers' individual assessments should be alarming for researchers and practitioners alike. Although an increasing number of researchers have started to express concerns about survey-based studies that rely on a single respondent from each company (this topic was covered in detail in section 2.2.3), research employing multiple respondents has been slow in coming (for an example, see Boyer and McDermott, 1999). The results of this study reconfirms the potential risks associated with the use of a single respondent. As for practitioners seeking to link their manufacturing strategies to their firms' competitive priorities, this part of the study also raises questions about strategy making processes that rely on the participation of a single function.

However, despite the disturbing nature of the initial disagreement among participants, soliciting their views individually and exhibiting the differences in a group setting resulted in two positive outcomes in this study. First, it served as a starting point in the establishment of company qualifiers and order-winners and revealed a wide range of factors that could be debated in a group setting—a benefit for the participating managers. This also allowed the researcher to establish a wider base of factors on which to do data triangulation. Second, it also served as an "eye opener" for the participants, who, until the final group meeting, did not have a chance to see their colleagues' responses and were openly curious about them. The diversity of views revealed by the summary charts or tables surprised most participants and acted as a "spark" for further fruitful discussions. This is an example of how a seemingly conflicting and negative dynamic in an organization can be used as a catalyst to drive strategic debate and lead to consensus—a useful factor for practitioners planning to utilize the basic methodology used in this study.

### 5.1.2. Consensus Seeking in Group Meetings as the Means to Resolve Functional Differences (P2)

#### 5.1.2.1. Steps to Achieve Consensus

Collective agreement on a set of competitive factors for the business, in this study, was achieved through a process which involved two primary stages: (1) soliciting the views of functional managers individually, (2) facilitating a group discussion with all participants to reach consensus (steps 2 and 4 in the process model proposed in chapter 2, figure-2.1). However, the process had to be partially modified, in different ways, for cases A and E. In case A, some of the functional managers decided to first solicit the opinions of their subordinates who managed key product groups

(brand managers in the marketing function), or who were in charge of key activities (assistant sales director, and customer service manager in the sales function). They then incorporated those lower level managers' views into their own assessments (section 4.2.5). Figure-5.2 illustrates the flow of the process used in case A.

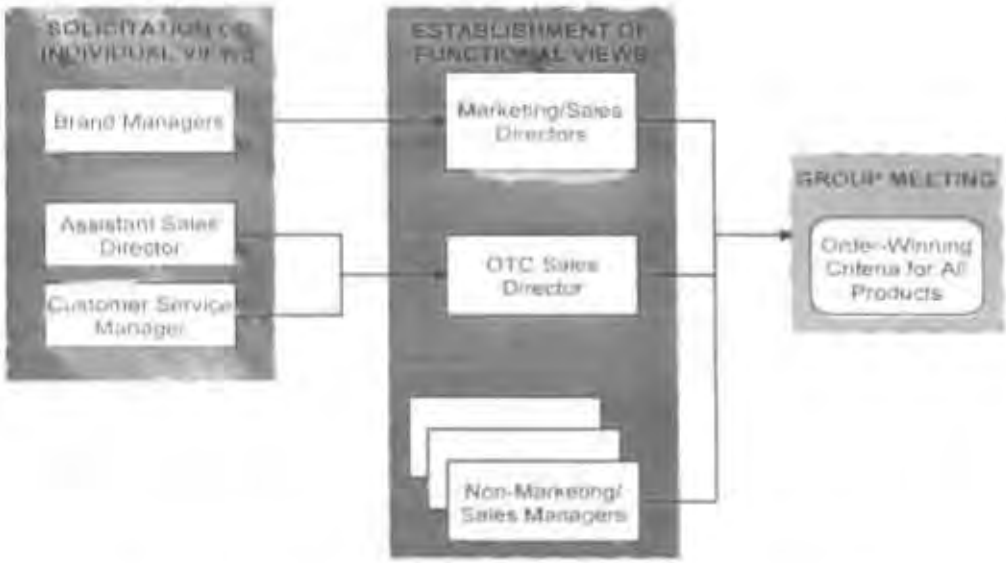


**Figure-5.2 Process Stages to Achieve Consensus in Case A**
(This process flow illustrates the path followed from the initial solicitation of individual views towards achieving consensus—the step of collecting data from other sources, step-3, figure-2.1, is not included here.)

Case E's managers made a different modification to the basic process to accommodate the high number of participants involved in the study (section 4.6.7). The single final group meeting format used in all other cases was replaced by four separate meetings involving different marketing directors (depending on the set of brands/products being assessed) but the same group of non-marketing managers/directors. An additional "final" group meeting was not necessary since the non-marketing participants were present at each of the four meetings with the respective marketing director(s). Figure-5.3 depicts the approach used in case E.

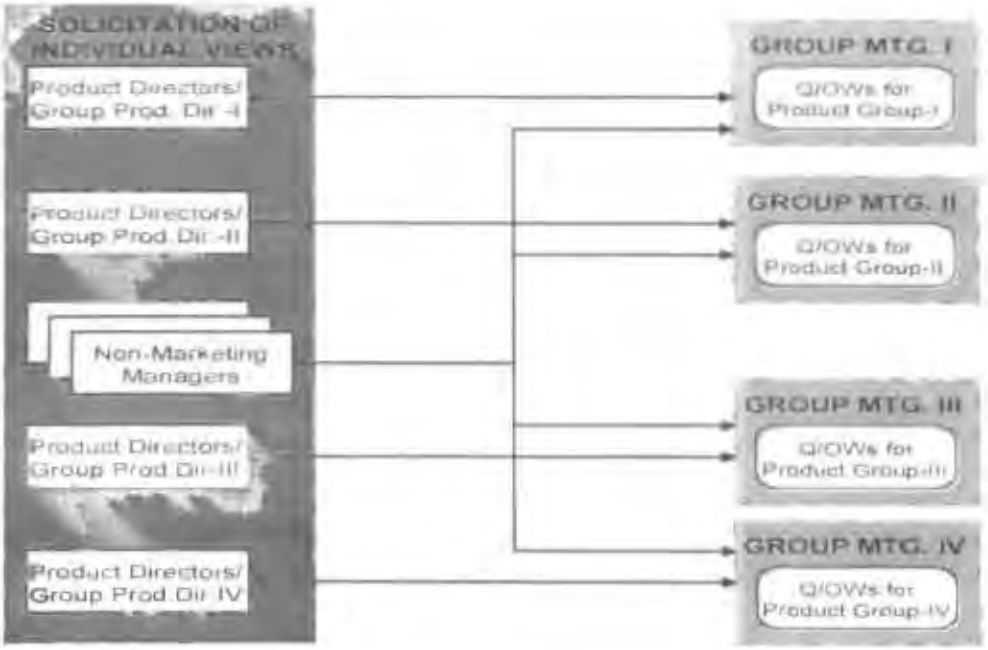


**Figure-5.3 Process Stages to Achieve Consensus in Case E**
(This diagram does not include step-3 of the original process model—data collection from other sources—figure-2.1)

Modifications such as these, undertaken to accommodate specific companies' circumstances, demonstrate the flexibility of case and action research, provide richness to the analysis, and improve the applicability of the basic process in real life.

5.1.2.2. Domination by Individuals

The design of the process in this research was deliberate in its intention to prevent the views of one participant, possibly the highest-ranking executive, from dictating the set of order-winners and qualifiers for the firm. Prior, and individual, solicitation of the functional managers' views ensured that those assessments were expressed without the fear of being scoffed at by colleagues, and were given equal consideration at the start of the final consensus-seeking meeting. In fact the study design went overboard in preserving the anonymity of individual respondents by removing the names/positions of those managers from the graphical or tabular exhibits shown at each group meeting (for examples, see appendix-IIB and IIC).

Even with the extra effort to ensure the unimpeded voicing of individual opinions, however, the process was not entirely free from influence from forceful executives during the group meetings.

In case C, the president of the company exerted gradually increasing influence during the discussions at the consensus-seeking meeting, partly negating the researcher's efforts to facilitate.

This top executive had a technical background and was recruited to the firm by its owners, approximately two years before, to bring, in the view of the owners, much needed 'new blood,' implement new management techniques, and revive the 30 year old company which had begun to stagnate (sales had been flat to declining during the prior three years). Many of his management staff had been with the company for over 15 years, and most lacked a university degree (the exceptions were the comptroller and the engineering manager, whom the president had personally recruited). The president was known to the researcher (from a prior employment) as an individual with strong opinions and one who highly valued individuals with a college degree (to the detriment of those without one). Being aware of his bias, the researcher reminded the president, during a discussion prior to the final group meeting, to be mindful of his influential position in the company and ensure that his staff's opinions were fully expressed and incorporated into the final assessments. In the early part of the group meeting the president seemed to be heeding the warning, and, as a result, all participants appeared to be contributing equally. However, as the meeting progressed, he slowly started to dominate the discussions. Although his tone was not confrontational, his body language was sending an unmistakable message to his staff, without actually verbalizing it: "I have heard enough, now I will show you how it really is!.." The other participants felt the nature of the message and gradually retreated. The group eventually reached what can be considered a consensus; i.e., there were no open disagreements with the final assessments of the criteria. However it is difficult to ascertain whether this in fact was a consensus or a simple sign of acquiescence on the part of the functional managers.

It must be concluded that in cases such as this, the researcher's role as a facilitator becomes particularly critical. One way to guard against this kind of domination in a group setting is for the facilitator to monitor the extent of contribution by the participants and to carefully seek the input of the passive individuals by asking generally provocative or direct questions. Another technique—directing the group's attention to opposing responses in the exhibited summary of individual quantitative assessments—also works when the dominating manager's strongly expressed views go unchallenged (but are not overtly agreed to) by others. Both of these techniques were used by the researcher to varying degrees in each case.

However one question that comes to mind is "how far should the researcher-as-a-facilitator go in preventing one individual, especially the highest ranking officer in the group, from dominating the debate in a meeting?" In some cases, assuring equal participation by all may require a strong intervention by the researcher. This may lead to an artificial suppression of the more knowledgeable and credible voices in the group. Equal participation as a prerequisite of identifying the "right" order-winners presupposes equally valid knowledge by all participants. Reality in organizations may not be so. As was demonstrated in case A, the director of Rx marketing and sales had key knowledge about the prescription pain-killer market which other participants did not possess. This manager's active participation during that part of the debate could have been considered dominating. However this 'domination' led to the clarification of the nature of the specific market and helped shape other participants' views. The resulting agreement on the order-winners of the Rx market turned out to be a true consensus, rather than a superficial one reached after capitulation by other participants.

After all, the primary objective of this process stage is to provide the backdrop for a multifunctional debate and simulate the interactions and exchanges of real-life organizational settings—not to ensure equal participation per se. If one of the managers dominate, then this should be seen as an indication of what the organizations face in real life settings.

Another implication of over-intervention by the researcher to ensure equal participation is that his action may cross the line between the role of an action researcher and that of a consultant. It should not be the action researcher's intent to change or reverse the direction of the present or emerging organizational dynamics in the firm. As stated in section 3.4, although it is acceptable for the action researcher to impose his or her conceptual frameworks on the tasks and interpret the events within these frameworks, one should not attempt to impose his or her opinions and conclusions over those of the company. Strong intervention by the researcher in the group debate to solicit input from passive participants, in order to counteract the domination of few, runs the risk of appearing biased toward one group's opinions.

#### 5.1.2.3. Different Consensus Results for Similar Products

One interesting outcome of this stage of the research was the apparent dissimilarity of the consensus assessments in cases A and E which are sister companies of the same corporation, operating in identical markets with identical products in two neighboring countries (United States and Canada).

These countries share many of the same characteristics in market structure, makeup of trade customers, and consumer behavior. Yet, the sets of criteria selected through consensus at the final group meetings appeared to be different for the two companies. Table-5.2 compares the final assessments in the two cases.[1]

| Criteria | Case A* | Case E** |
|---|---|---|
| Unique/Value-Added Features and Services | 40 | - |
| Trade Services/Ability to Customize | - | 30 |
| Preferred Supplier/Corporate Reputation | 30 | - |
| Brand Name | - | 35 |
| Delivery Reliability | 20 | Q |
| Product Range | 10 | 5 |
| Product Innovation/New Products | - | 30 |
| Time-to-Market with New Products | - | Q |
| Delivery Speed | - | Q |
| Price | - | Q |
| Quality Conformance | - | QQ |

**Table-5.2 Comparison of Consensus Assessments for cases A and E.**
*** OTC Products Segment**
**** Adult Tylenol Segment**

A cursory look at table-5.2 indicates a wide disparity between the two assessments for essentially the same products. Only two of the criteria are common: delivery reliability and product range. All other criteria were assigned weights only in one of the cases, which may lead to the conclusion that those groups of products qualify and win orders for the two companies in different ways. However, a closer look, especially at the meaning of the criteria, reveals a mixed picture. "Unique/value-added features and services," and "trade services/ability to customize," two highly rated criteria in cases A and E, respectively, represent identical competitive responses. They only differ in detail, e.g., in case E, an important trade service was considered to be the customization of the shipping container, and in case A this was less important. Similarly, "preferred supplier/corporate

[1] Although the two companies had identical business missions in the two countries, there were some differences in the way the final market segments were assessed (see sections 4.2.7 and 4.6.7). To enable a fair comparison, the OTC segment from case A (which covered the combination of all over-the-counter brands), and Adult Tylenol segment from case E (which is the largest volume over-the-counter brand with approximately 60% of sales) have been included in table-5.2.

reputation" in case A, and "brand name" in case E, although expressed differently, signify similar capabilities—the preservation of a company or product trademark. Combined, these similarities cover all of case A's and 70 percent of case E's order-winners.

The last order-winner in case E, "product innovation/new products" represents the only important criterion not rated by managers in case A. This could stem from company A's reliance on company E as the primary source of new products, e.g., product innovation is done in the United States, then copied in Canada one to three years hence. Although launching new products to increase sales is a shared business strategy in both companies, managers in company A did not consider themselves burdened by the need to come up with the new products. This could explain their exclusion of this criterion from the final set. The rest of the criteria (the last four in table 5.2) are the factors considered as qualifiers in case E, but not in case A (participants in company A decided to disregard the concept of qualifiers—see section 4.2.5).

Having compared each aspect of the two companies' assessments of a similar set of products, it is difficult to ascertain, in this study, what factors led to the differences observed. Among the probable causes are: true differences in the market demands for those products in the two countries; the makeup of the participants (e.g., their backgrounds, subjectivity of their views, etc.); other organizational dynamics (hidden agendas, inter-departmental politics, etc.); or simple semantics. Depending on what the main causes are (investigation of these causes is outside the scope of this study), the impact of this apparent dissimilarity on an eventual formulation of a manufacturing strategy may or may not be significant. In one scenario, each of these companies' manufacturing function may start with a different-sounding set of qualifiers and order-winners and end up linking them to a similar set of manufacturing objectives, thus formulating identical manufacturing strategies. On the other hand, if the differences in the set of market factors stem from unique market requirements, then, properly linked, this may result in different manufacturing strategies for the two firms. Further research is needed to investigate this phenomenon.

In spite of the caveats described in this section, some form of consensus was in fact reached at the end of the group meeting in every case. Participants concluded that the final assessments were representative of the competitive stance of their firms' products, and that the agreed set of criteria could form the basis for a manufacturing strategy they may decide to formulate in the future.

### 5.1.3. Use of a Pre-selected, Comprehensive Set of Criteria Instead of the Traditional Four Generic Criteria (P3)

One factor that determines which criteria are considered for assessment is the initial list presented to the participants. Although the managers in this study were allowed to add criteria of their own, it is difficult to determine whether certain competitive factors did not receive consideration simply because they were not included in the set initially presented to them. An example is the general term "flexibility," frequently used in earlier OM literature, but which started to be scrutinized because of its multidimensional nature (Gerwin, 1993; Upton, 1995). Some of the dimensions, or types, of flexibility are external (i.e., visible to the customer—see section 5.1.4), such as volume flexibility, and demand fluctuation flexibility, whereas others are internal (i.e., they reflect manufacturer's capabilities), such as routing flexibility, and part substitution flexibility. In this study, only criteria of the first type were included in the master list initially shown to the highest-ranking executive at each site. None of the participants in this study suggested the addition of the term flexibility in its general sense. Had it been included in the initial set, the question remains, would it have received ratings from some managers?

This issue is linked to one of the modifications made to Hill's approach in this study: the use of a pre-selected set of criteria. Hill suggests that participants should be asked the question (how do your products qualify and win orders in the marketplace?) without being shown a list of possible criteria up front. In his view, pre-selection conditions the participants and may bias their assessments. It is better, he asserts, to keep it completely up to the managers to express the market priorities in their own words[2]. In this sense, the exclusion of certain criteria intentionally (as was done in this case, for example, with the flexibility criterion) or unintentionally, may have indirectly affected their assessments. This researcher's prior experience, however, indicates that managers respond well to a more structured approach. Pre-selection of criteria and availability of guidance on how order-winners/qualifiers could be expressed provide part of that structure. During the individual interviews, and especially in the group discussions, having a common set of criteria which could be discussed, modified, added to, or deleted from, allowed the participants to concentrate on debating their relevance and relative importance, and subsequently come to a common understanding (i.e., consensus).

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[2] Personal conversation, 1996.

One notable published study in which a similar question about the firms' competitive factors was asked of its participants is Platts and Gregory (1992). Each of the six companies which comprised that study started with the same set of manufacturing-related criteria, and none introduced further manufacturing-related criteria (although some companies added non-manufacturing ones). This study differs from Platts and Gregory's in that aspect. In all of the cases participants added new criteria, and changed some of the existing ones. Table-5.3 provides a quantitative summary of the changes and additions made to the master list of criteria used as a starting point in each case.

| | Case A | B | C | D | E |
|---|---|---|---|---|---|
| Number of criteria taken directly from the master list | 7 | 8 | 9 | 8 | 10 |
| Number of criteria modified/redefined at various stages | - | 2 | 1 | 2 | 1 |
| Number of criteria deleted | - | - | - | - | - |
| Number of new criteria added by the participants | 1 | 1 | 2 | 3 | 6 |

**Table-5.3 Summary of Changes and Additions Made to the Initial Set of Criteria**

In more qualitative terms, the list below summarizes the criteria added (and specifically worded) by the participants in each case.

| | |
|---|---|
| **Case A:** | • Unique/Value-added features and services |
| **Case B:** | • Unique product design |
| **Case C:** | • Product Development cycle time<br>• Dealer/Reseller skills |
| **Case D:** | • Ability to customize<br>• Product development<br>• [Distributor] Representative skills |
| **Case E:** | • Professional endorsement [of the product]<br>• Responsiveness to [product] promotions<br>• Value-added features and services<br>• Communication of product benefits [to users and physicians]<br>• Ability to customize promotions/end-products<br>• Ability to customize trade case configurations |

**Table-5.4 List of Criteria Added by Participants**

As the list in table-5.4 indicates, all of the criteria added by the participants were sufficiently descriptive, i.e., none used general terms such as "service," or "agility." This may be a direct result of the participants' natural need to express their competitive stance in actionable terms, or of the non-generic and descriptive nature of the initial set used, or a combination of the two. In either case, one can conclude that using a sufficiently descriptive, specific and comprehensive set of criteria enriched the debate during the assessments and helped participants better delineate their firms' competitive priorities.

The benefits of this approach for practitioners is obvious. From an academic point of view, pre-selection of criteria provides a structure to the research process which aids in repeatability, particularly for cross-case analysis.

### 5.1.4. Differentiating Between Market-Based, External Criteria and Manufacturing-Related, Internal Criteria (P4)

All criteria used in this study had an external orientation (i.e., each represented market factors that are visible to the customer, rather than symbolizing capability-based internal factors that are important to the firm—see sections 2.1.1 and 2.2.4). This distinction was not made explicit to the participants at the beginning of the study. Nevertheless, managers intuitively accepted and consistently used the approach. Evidence of this can be found in the absence of purely

manufacturing-based criteria from the sets of criteria debated at various stages of the process (appendix-IIA). Perhaps the best indication of the managers' acceptance of this differentiation is the nature of the criteria put forward by them prior to and during the final group meetings. Examination of the list in table-5.4 above reveals the primarily external nature of the factors (although some could also be seen as manufacturing-capability-based).

A major contributor to the consistency with which the criteria were expressed could be the nature of the inquiry itself. Intuitive as it may seem, the very question "how do your products win orders in the marketplace?" may have led the participants to direct their attention to external factors which impacted their firms' competitive stance. In comparison to most of the other commonly used terms such as production competence, and manufacturing capabilities (for a complete list, see section 2.1.1), the term "order-winner" has an inherently external orientation. Even competitive capabilities, another frequently used term, emphasizes internal competencies of a firm while making reference to "the competition." By attempting to identify those internal capabilities directly, researchers and practitioners may be omitting the market factors that drive the need for those competencies.

Interestingly, previous studies do not adequately address this issue. Platts and Gregory (1992) report that the participants in their study had difficulty with the distinction between 'the customer' and 'the market' in answering the question related to 'winning the orders.' Thus the authors suggest that "... a better question to ask is, 'what are the requirements imposed upon manufacturing by the way products win orders in the market?'" (Platts and Gregory, 1992: 42). In doing so, the authors specifically use manufacturing-related criteria, therefore directly address internal capabilities alone. This is consistent with the vast majority of published studies which examined competitive criteria in general (the only exceptions are Menda and Dilts, 1997; and Swink and Hegarty, 1998).

It is difficult to conclude, from this study alone, that the uniformity in the orientation of the criteria within each case led to the identification of a more accurate set of competitive factors. However, the participants' quick adoption of this approach, and the success in keeping the consistency throughout the study, may be proof that internal vs. external distinction can be achieved for all criteria, and used in plant-based research. As for practitioners, keeping the criteria consistently external at this stage of the process would serve as a useful first step in explicitly linking internal capability building to market drivers.

### 5.1.5. Emphasizing the Diversity of Market Segments Through the Use of Qualifiers and Order-Winners (P5)

Inclusion of all the market segments, product groups, or customer types in assessing each firm's means of competing was one of the key elements of this study (section 2.2.4). At the start of each case, during the initial meeting with the highest-ranking manager, a broad segmentation of the company's markets was done. The survey forms used during the individual interviews clearly encouraged each participant to think of each of those segments separately while assessing the competitive factors. However, it was pointed out by the researcher, at various stages of the process, that different segments may indeed have identical sets of qualifiers and order-winners. Participants were also encouraged to re-segment, add, or delete segments if they considered it necessary. The researcher's objective was to encourage the managers to be all inclusive in assessing their firms' products (rather than considering their primary product line alone), without implying that each of those segments must necessarily have different qualifiers and order-winners.

This approach appears to have achieved its objectives. Table-5.5 summarizes the change in the number of segments used at various stages of the process in each case.

| | Case A | B | C | D | E |
|---|---|---|---|---|---|
| Number of segments used at the beginning of the study | 6 | 4 | 4 | 2 | 10 |
| Number of segments identified by participants during individual interviews | 2 | 4 | 4 | 11 | 10 |
| Number of segments at the end of final group meetings | 2 | 8 | 4 (2)[3] | 8 | 8 |

**Table-5.5 Illustration of the Diversity of Distinct Market Segments Identified by Participants at Various Stages of the Process.**

A convergence of segments at the final stage in cases A and E (from six to two, and from 10 to eight, respectively) contrasts the divergence observed in cases B and D (from four to eight, and from two to eight, respectively). In case C, although four segments were defined by the participants at

[3] The number in brackets represents distinct sets of criteria

the final meeting, the first three were assigned a common set of qualifiers and order-winners, leaving only two overall groups with distinct sets of criteria (see table-4.8).

As discussed in more detail in chapter 4, case descriptions, the final assessments highlighted significant differences in competitive factors among the various product segments of each firm. The source of differentiation among the final groupings was not only product, market, or customer-type-related. Other factors also played a role in further differentiating certain segments in various cases. For example, in case B, RV Products segment, the original parts supplied to RV manufacturers (*OEMs*) qualified and won orders in ways different from the same parts sold to repair shops (*after market*). Similarly, the *existing customers* and *new customers* in the Garden Hose segment received different assessments. Municipal Products' *current* and *1-2 years* [in the future] qualifiers and order-winners were also different (see table-4.6, appendix-IIA). In case E, the A/C/S & CTC products segment was assigned different sets of criteria for the *current* and *new products* (table-4.12, appendix-IIA). These are important distinctions in market-related factors with potential impact on the companies' manufacturing strategies—factors that could be lost if their primary product lines alone were considered.

In uncovering the diversity of market factors through segmentation, an interesting phenomenon was observed in cases D and E. In case D, the laboratory chemicals segment was sub-segmented by different participants three different ways: by type of immediate customer, by type of product, and a hybrid of the two schemes (figure-5.4). In case E, two different schemes were used for the entire business—by product type, and by type of trade customer (figure-5.5).

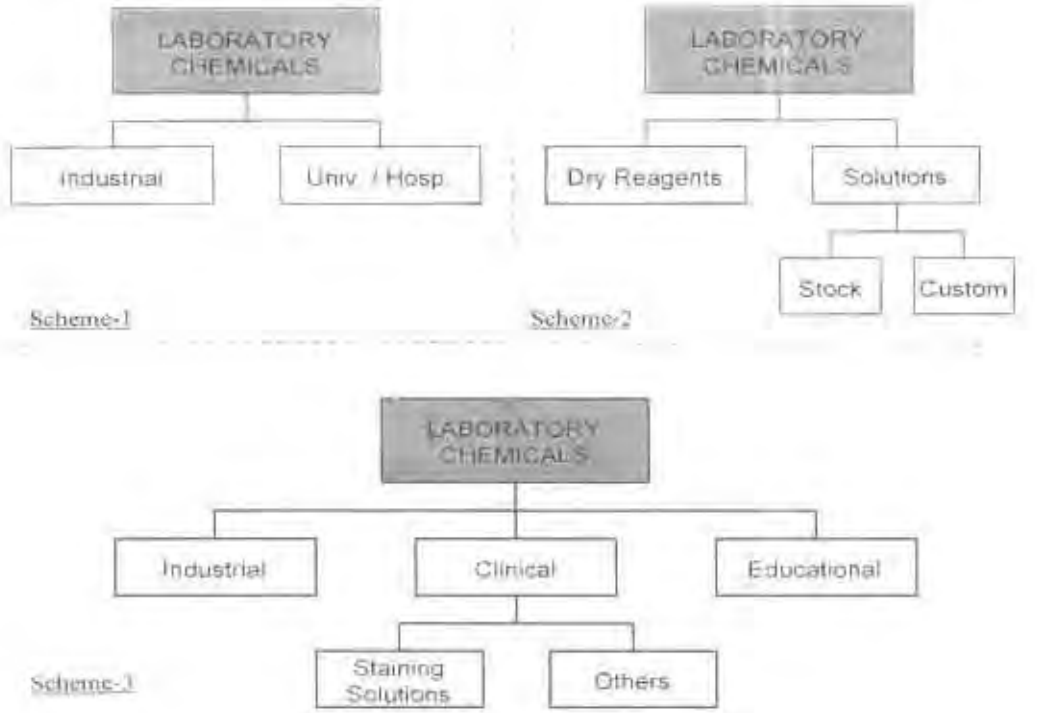


**Figure-5.4 Different Segmentation Schemes Used by Different Functional Managers for the Same Market in Case D.**

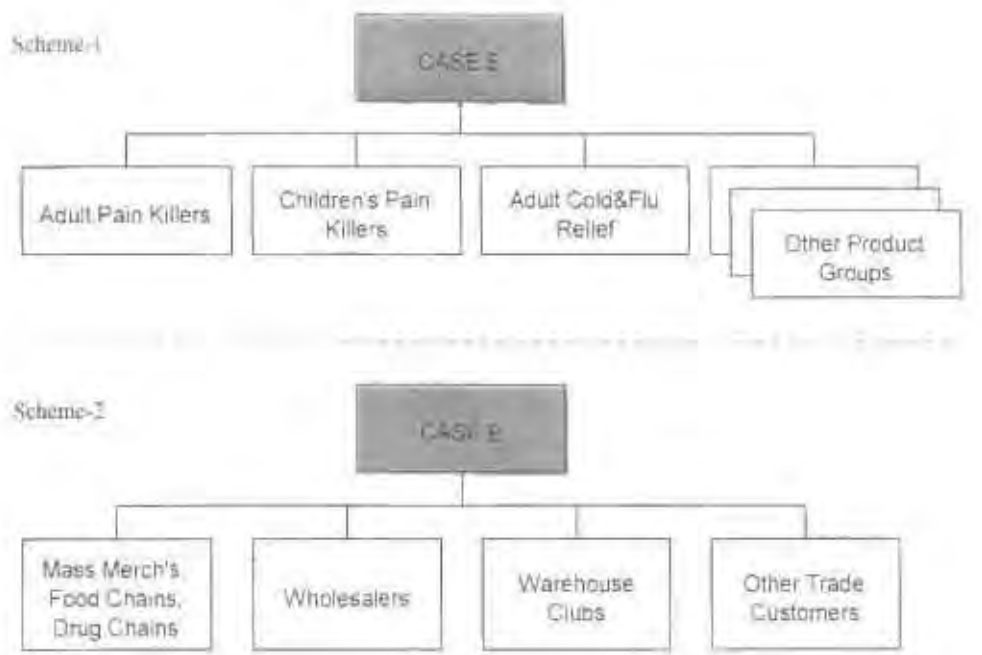


**Figure-5.5 Different Segmentation Schemes Used in Case E.**

A closer look at the functional affiliation of the individuals who suggested those schemes reveals a common thread. The segmentations by product type were suggested by marketing and most other functions, whereas segmentations by customer type were conceived by the sales functions in each company. The marketing and sales departments at both of these firms were well organized, and staffed by individuals with well entrenched views (as opposed to their counterparts in the other, smaller companies, where most managers had less of a "silo" mentality). It may be, then, natural to expect those functional managers to perceive the market characteristics of their firms' products from different angles. As is common at marketing-oriented companies, firms D and E had marketing departments which were structured around brand management principles. Each brand or product group was managed by a product or brand manager. On the other hand, the sales functions in both companies focused on differentiation among their primary groups of customers, or, in the case of firm E, among classes of trade (mass merchandisers, wholesalers, food store chains, etc.). Consequently, the views of those managers were divided along functional lines.

This should serve as a caution both to practitioners and academics. Once the decision is made to deviate from the "cleanliness" of considering only the primary product line of a firm, identification of the entire spectrum of segments and their associated unique market factors may become messy. In cases where those differences in segmentation are resolved at the final group discussion, as was the case with all the firms in this study, the initial "messiness" would have served as a means of data triangulation. In cases where consensus cannot be achieved, however, reconciliation of this type of disagreement may become problematic for practitioners. Failure to agree on the way to segment the markets, products, or customers, would prevent managers from formulating a clear manufacturing strategy. Future researchers looking beyond the primary product line, too, will have to ensure that the segmentation scheme is clear and accepted by all participants before starting the data collection.

### 5.1.6. Distinction Between Qualifiers and Order-Winners (P6)

The conceptual difference between qualifying and order-winning criteria was, by the end of the group meeting, sufficiently understood and applied by the participants in each firm, with the exception of managers in case A (see section 4.2.5). In general, when the researcher first explained the concepts to the participants, the distinction between the two seemed intuitively simple to most of

them. As the study progressed, however, some of the managers started to confuse the two types of criteria, and the researcher had to reiterate the distinction, often by stating examples from outside their firm (so as not to bias their assessments). Two of the most recurrent errors by the participants were the assignment of percentage weights to qualifiers (instead of simply identifying them with a "Q"), and identification of some criteria as qualifiers and order-winners at the same time. When these were pointed out by the researcher, however, the managers were able to understand the explanations quickly and made the necessary corrections.

Of all the assessments made in the five cases, there were two instances in which the conclusion reached (through consensus) on the nature of a specific criterion (i.e., whether it is a qualifier or an order-winner) did not reflect the facts uncovered during data collection. The first was case A, in which the assessment of the prescription (Rx) products segment created a long and heated debate. As was detailed in section 4.2.7, price was selected as the primary (80% weight) *order-winner* for that segment. However, the facts put forward by the participants and data collected by the researcher support the conclusion of price as a *qualifier*. Because of the provincial government's drug plan provisions, which dictated the use of cheaper (generic) versions of covered drugs, the firm had priced its Rx products at parity with the generics. Consequently, pharmacists filling the prescriptions under the government plan were required to ask the patients which version they preferred. In those cases where patients chose firm A's version, it was the brand name and the feeling of trust it conveyed that won the order. In other words, in this segment, the company qualified on price (got its name on the short list), and won orders on brand name (end-users picked it based on the name they knew and trusted). The difference between this and the participants' assessment can, at least partially, be attributed to their initial rejection of the concept of qualifiers. Having robbed themselves of the option of considering certain criteria as qualifiers, they were left with only the choice of declaring price, which had been the focus of the debate, as the primary order-winner.

The participants in the second instance, case D, did not have the same limitation, i.e., they utilized both types of criteria. In the haemodialysis products segment, delivery speed and delivery reliability were identified as qualifiers, and price as the sole order-winner (table-4.8). However, examination of the data obtained from the marketing and sales staff and review of company documents uncovered a different dynamic. According to the common practice, at the beginning of each year, hospitals accepted bids from suppliers and selected two to four manufacturers with the

lowest bids to be on the supplier list for a specific range of products. Those hospitals then made their individual purchases, throughout the year, from those select suppliers, based on, for example, their ability to meet certain delivery dates, or ability to make specification changes to a standard product. Again, using Hill's distinction, the logical conclusion would be that company D qualified in the haemodialysis market on price, and won orders on delivery speed and ability to customize. The result of the participants' quantitative assessment, which was reached through consensus, contradicted this conclusion.

The researcher, as also stated in section 5.1.2.2, limited his intervention to one of asking probing questions of participants, ensuring that opinions of all functions present were voiced, and presenting any other relevant data collected outside the interviews and meetings, without imposing his own conclusion.

The two occurrences outlined above could be considered as exceptions[4]. No similar apparent contradictions were observed in other cases—a conclusion which supports proposition 6. In fact, the inconsistency in case A can be seen as confirmation of the assertion that differentiating among the criteria (qualifiers vs. order-winners) helps managers to categorize and prioritize the important market drivers for their businesses. Because managers in company A did not use the concept of qualifiers, one can conclude, they could not adequately identify the "correct" criteria for the Rx products.

However, the wide disparity observed in the nature of several criteria at the individual assessment stage should still serve as a caution to both researchers and practitioners. Even with the guidance provided by the researcher during the one-on-one interviews, many participants mistook some order-winners (as agreed at the end of the group meeting) as qualifiers and vice versa. It wasn't until they had the opportunity to hear each other's views and evaluate the supplementary data presented by the researcher during the group meetings that their understanding of the distinction between qualifiers and order-winners actually "gelled."

[4] These two events occurred within a population of 268, representing a rate of less than 0.8%. The population is calculated by multiplying the number of criteria evaluated by the number of market segments assessed at each group meeting, and adding the numbers for each case (i.e., the number of chances the participants had to make the "right" or "wrong" assessment on each qualifier or order-winner).

## 5.2. REFLECTIONS

This section discusses additional observations and points uncovered during the course of the study, which, although outside the initial scope and pre-stated propositions, are relevant to the process of manufacturing strategy formulation.

### 5.2.1. The Conceptual Appeal of Qualifying and Order-Winning Criteria

As stated in section 1.5, it was expected that the concepts of qualifiers and order-winners would be understood and applied equally well by all participants, regardless of their educational or professional background, or of their present functional affiliation. Although this study's main purpose was to examine the *process* aspect of manufacturing strategy formulation, participants' grasp of the concepts was expected to be an important factor in answering the basic research question (section 2.3.1) and in the application of the proposed process (section 2.3.2). As discussed in section 5.1.6, other than the two instances in which one specific criterion was labeled as an order-winner in a manner inconsistent with the data collected, all participants related to the concepts well, and were able to use them in their assessment of their firms' means of competing.

The marketing and sales managers in all cases were among the participants who, during the individual interviews, most readily grasped the meaning of the concepts and quickly went on to assess the relative importance of the criteria listed. Some of the marketing managers, in an attempt to demonstrate the extent of their comprehension, even offered other phrases as synonyms for the term "qualifiers," such as "price of entry," and "hygiene factors." The existence of written marketing plans, which identified the firm's markets, major customers, primary competitors, and the overall basis of competition, in companies A, C, D, and E, helps explain marketing managers' quick and enthusiastic engagement during the interviews and group meetings. Sales managers engaged in a similar fashion as well, being able to draw clear distinctions among different product or customer segments, and assigning the appropriate criteria to each. Some even remarked that the term order-winners particularly appealed to them since "winning orders is what [the sales function] is all about."

The non-marketing/sales managers, overall, needed a slightly longer time during the individual interviews to fully comprehend the concepts, and use them in assessing their firms' products. However, as the study progressed, they, too, displayed evidence of comfort with the

terms and their application. During the final meeting in case E, when one of the marketing group product directors proposed the addition of "ability to provide sufficient production capacity" as an important order-winner for all the company's segments, the director of national planning remarked that the purpose of the debate was the assessment of *market factors*, not *manufacturing capabilities*—a statement with which the marketing director quickly agreed. Several operations managers in other companies also commented to the researcher that focusing on market-related factors through the use of qualifiers and order-winners enabled them, in the words of the production manager in case D, "... to talk about the business with those marketing and sales guys using *their* language." The fact that the discussions did not specifically address manufacturing factors, and remained focused on the market criteria, in their view, allowed the operations managers to consider themselves as strategic partners with sales and marketing functions.

The concepts' appeal was not limited to the participating functional managers in the firms; manufacturing foremen and shop-floor employees, who were interviewed or conversed with during the observation and data triangulation phases, too, related well to the concepts. Although none of them participated in the final group discussions, their enthusiastic engagement, whenever the concepts were used by the researcher, indicated a high degree of comprehension among the non-managerial staff. These could be seen as further proof of the broad appeal of Hill's terminology.

### 5.2.2. Qualifiers and Order-Winners As The Main Link Between The Business and Manufacturing Strategies

The exclusively external orientation of these concepts, as explained in section 5.1.4, provided a level of consistency in the expression of market factors that are important to a firm. However, that "externality" also highlighted the need for the incorporation of another step into the process before a meaningful manufacturing strategy could be formulated—*identification of the manufacturing tasks* (i.e., factors the manufacturing function would need to emphasize in order to provide the necessary support for the firm's qualifiers and order-winners). This point was made by the manufacturing managers in cases A, D, and E. As described in the case descriptions (chapter 4), at the end of the final group meetings, those managers expressed their desire to convene another meeting among the operations managers and "figure out" what those criteria meant for manufacturing (although none of those participants actually used the term "manufacturing tasks"). This raises a question about the use of the market criteria (i.e., qualifiers and order-winners) to *directly* link the business and

manufacturing strategies. By selecting solely market-related criteria to determine the basis of competition, and consequently staying close to the market end of the continuum, companies may be too far away from the manufacturing end. Therefore the additional step of assessing the manufacturing tasks would be needed to determine the manufacturing-related priorities that should be linked to the market factors.

For example, if a company wins orders in a specific market on price, an obvious manufacturing task would be cost reduction; if delivery speed is an order-winner for a make-to-order company, then lead-time reduction would be one of the important manufacturing tasks for the firm. Naturally, not all qualifiers and order-winners are supported by manufacturing. The manufacturing function may directly influence certain criteria, such as price or delivery reliability; or it may indirectly support others, such as new product time to market. However it may not have any influence on certain other criteria, such as after-sales service, or high-performance design. In those cases, other functions would need to determine their levels of support, and incorporate those priorities into their own functional strategies.

This distinction between market-based external criteria (qualifiers and order-winners) and capability-based internal criteria, and the links between them have not been sufficiently addressed in the OM literature, with the exception of Swink and Hegarty (1998). Further examination of this point is outside the scope of this study, therefore, no further discussion will be attempted here other than to state that researchers and practitioners should be aware of the need for further clarification of the market criteria before undertaking a full manufacturing strategy formulation process.

### 5.2.3. Distinction Among Different Levels of Customers

During the individual interviews and the group discussions in cases A and E, the question "how do you qualify and win orders...?" was countered by the following question from some of the participants: "from whose point of view should we consider this?" Those managers wanted to highlight the fact that their firms did not sell directly to the end users of their products. Two additional levels of customers stood between the manufacturer and the end user: *the trade customer* (wholesalers, distributors, chain stores), and *the retailer* (the entity that is in direct contact with the end user). These groups of customers at each level impose their unique sets of demands on the manufacturer which form the basis for the manufacturer's qualifying and order-winning criteria. Furthermore, complicating this multi-level relationship are physicians and the regulatory agencies

(e.g., the Food and Drug Administration—FDA), who have influencing effects on the manufacturer and the end user. This relationship for cases A and E is shown in figure-5.6.

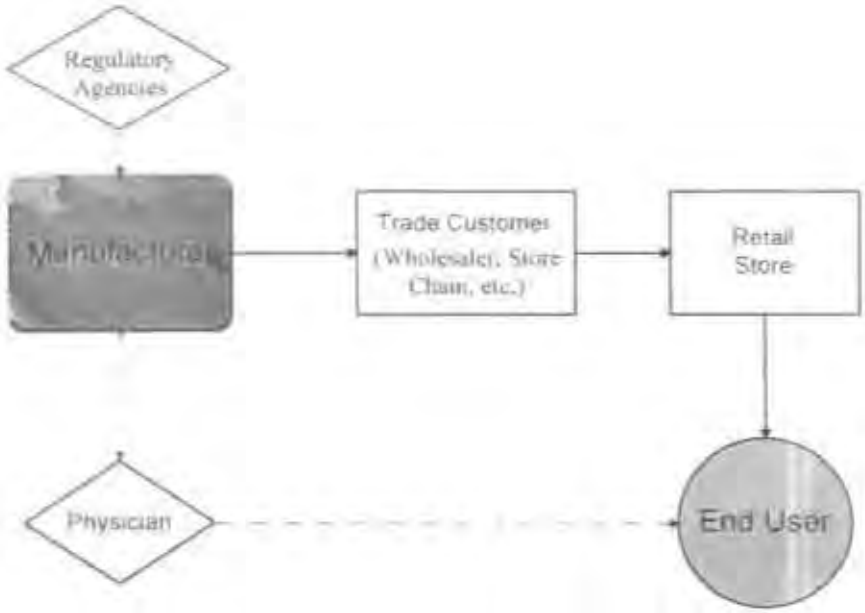


**Figure-5.6 The Multi-Level Nature of a Firm's Customers: Cases A and E.**

The direction of the product flow from the manufacturer to the end user is represented by solid arrows. The intermittent arrows depict the influencing relationships among the stakeholders. For example, the manufacturer tries to influence physicians' drug recommendation rate through the use of a professional detailing[5] force. These company representatives inform the doctors on the latest clinical studies related to the indications and benefits of the firm's drugs and provide them with product samples. The doctor's office is where many patients receive professional endorsement of a drug manufacturer's products; therefore the physician's recommendation plays a significant role in the consumer's purchase decision. Regulatory agencies, too, can play a role in a pharmaceutical manufacturer's strategy. These agencies, primarily established to provide consumer protection, can significantly limit the way the manufacturing function responds to business demands. Certain types of flexibility (e.g., routing, or parts substitution) enjoyed by manufacturers in many other industries cannot be utilized by pharmaceutical manufacturers without a lengthy prior approval process.

[5] The term refers to specially trained sales representatives who can converse with physicians on specific "details" regarding the use of the firm's pharmaceutical products.

The model depicted in figure-5.6 illustrates the complex relationships among the various stakeholders which have qualifying and order-winning influence on the manufacturers in cases A and E. Other cases had simpler supply chains, and correspondingly simpler influencing relationships. The customer hierarchies for all cases in this study have been summarized in figure-5.7 (influencing relationships have been excluded to simplify the illustration).

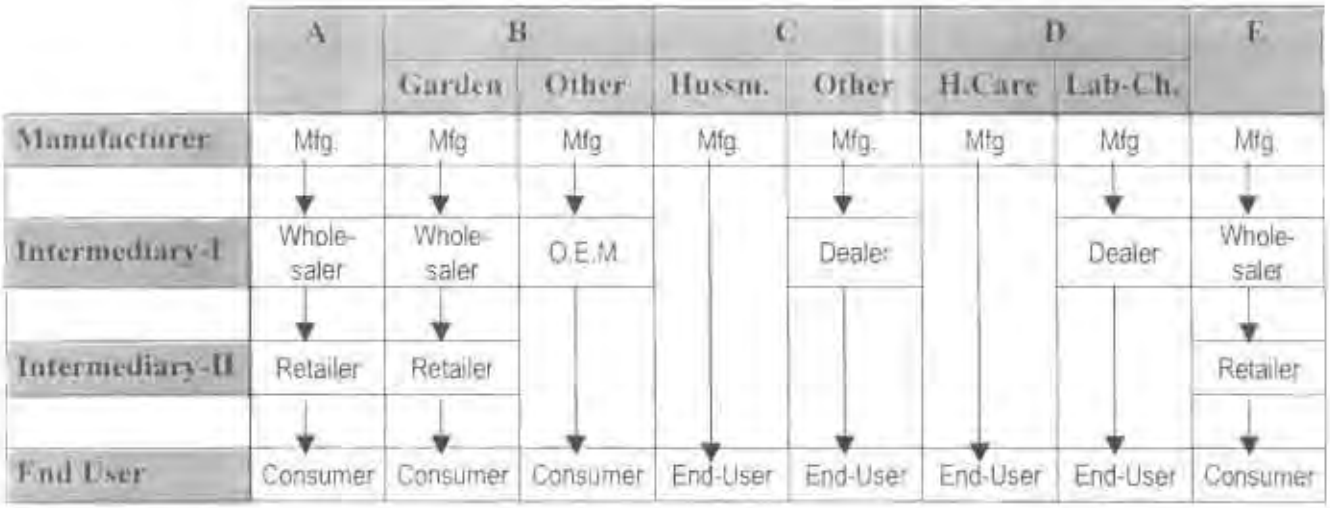


**Figure-5.7 The Multi-Level Nature of the Firms' Customers**

The implications of these kinds of customer structures on the assessment of qualifiers and order-winners may be significant. Each customer or stakeholder within each company's supply chain may impose a different set of demands on the manufacturer. Although some of those criteria may overlap (i.e., demanded by all customers), some others may be unique to one stakeholder. Using the example of case E, table-5.6 illustrates this point by assigning each criterion in the final assessment (table-4.12) to one or more customer/stakeholder.

| Criteria | Trade Customer | Retailer | End-User | Regulatory Agencies | Physicians |
|---|---|---|---|---|---|
| Price | | | X | | |
| Delivery Speed | X | | | | |
| On-time Delivery | X | | | | |
| Quality Conformance | | | X | X | |
| Product Innovation/ New Products | X | X | X | | |
| Broad Product Range | X | X | X | | |
| Time to Market with New Products | X | | | | |
| Package Superiority | | | X | X | |
| Trade Services/ Ability To Customize | X | | | | |
| Brand Name | X | X | X | | |
| Communication of Product Benefits | | | X | | X |

**Table-5.6 'Criteria vs. Customer-Type' Matrix for Case E.**

As reflected in table-5.6, for example, price is important to the end-user who purchases the product off the shelf after evaluating its price vs. perceived value relationship. The trade customer and the retailer, on the other hand, are more concerned about their profit margins, rather than the absolute value of the price, since they carry a range of high and low-priced products. Quality conformance is of concern to the end-user and the regulatory agency, whereas delivery speed and reliability are important only to the trade—the direct purchasers from the manufacturer.

Although this kind of delineation among the customer hierarchies and their varied influence on the qualifiers and order-winners can be made for each case, no such criteria vs. customer matrices were constructed during the course of the study. When the question of "whose point of view should we take?" was raised by the participants, the advice given by the researcher was to consider all stakeholders in the assessment. Although not tested in this study, this distinction may be introduced as a modification to the original process model proposed by this study and used to achieve a more structured assessment process.

Having examined the findings from within- and cross-case analyses, and how those relate to the research propositions, the next, and final, chapter summarizes the primary conclusions.

# Chapter 6. CONCLUSIONS, LIMITATIONS, AND FURTHER RESEARCH

This study examined the process of determining the qualifying and order-winning criteria for a firm's products, using a plant-based, multiple-case, action research methodology. The use of multiple respondents from each company, supplemented by data obtained from other sources, was central to the study design. The theoretical propositions, developed through literature search (stated in section 2.3), were used as the backdrop to construct a basic process model which was applied at multiple sites in order to test those propositions. Chapter 4 illustrated the application of the process through case descriptions, detailing the outcome of the individual steps and providing within-case analysis at each stage. Further in-depth discussion of cross-case patterns, unique incidences, and logical inconsistencies, presented within the framework of the theoretical propositions, comprised chapter 5. Also included in chapter 5 were some additional observations and their analysis that were not initially anticipated as part of the propositions.

This chapter attempts to contribute to theory by first presenting the study's principal conclusions related to the research propositions, as well as how those individual findings collectively support an enhanced process model for determining the means of competing in manufacturing firms. This is followed by the standard tests of research rigor. Finally, the study's limitations and suggestions for future research are offered.

## 6.1. Conclusions Related to the Study Propositions and the Process Model

This section provides a summary of the main findings of this research, structured around the theoretical propositions, and culminating in an expanded process model. More in-depth analysis of cross-case patterns which serve as evidence of the individual findings itemized below was covered in chapter-5.

### 6.1.1. Conclusion-1

**Significant disparities exist in the way functional managers within a firm individually view their means of competing in the marketplace** (P1[6]). Prior to the improved understanding

[6] **P1** - Managers from different functions in a company may have differing perspectives on the way in which their firm qualifies and wins orders in the marketplace. Therefore the step of identifying those factors should involve the solicitation of each key manager's views individually.

generated during the subsequent stages of the process model applied in this study, each of those otherwise knowledgeable, and high-ranking, officers offered a significantly different representation of their company's qualifiers and order-winners. Implications of this finding (both in research and practice) could be significant. Importantly, the results clearly demonstrate the need to use more than one source to establish the means of competing for a firm's products—a key step in formulating a manufacturing strategy which is linked to the firm's business strategy. In academic terms, this suggests that in survey-based studies (using questionnaires or interviews) responses from more than one participant must be sought. On the practice side, similarly, companies seeking to examine their competitive market criteria should involve managers from several functions, such as design, marketing, sales, as well as manufacturing, before progressing too far in the strategy formulation process.

This conclusion is supported by the wide disparity observed among the participants' individual quantitative assessments in each of the five cases (for quantitative data analysis see table-5.1, and figure-5.1). The differences in perspectives did not only relate to the nature of the criteria (i.e., qualifier vs. order-winner), but also to the weights (i.e., degrees of importance) attributed to order-winners. We can conclude then, that with such a wide-ranging disagreement in views, no one participant's quantitative assessment can be taken as the definitive response representing the firm's overall standpoint in a research study, or as the sole basis for the formulation of a manufacturing strategy in a real-life business application.

Utilization of more than one source, however, should not be confined to the use of multiple respondents. Evidence in this study suggests that data triangulation should be extended to the utilization of other types of sources, such as documentation and participant observation. In virtually every case, examination of internal and external documentation, and additional interviews with plant personnel, brought to light relevant information that was not offered by any of the functional managers. In some cases the data collected contradicted the views articulated by the managers up to that point in the process. Subsequent presentation of such information in group settings provided the participants with additional perspectives, and led to a more informed decision making (i.e., consensus assessment of means of competing).

### 6.1.2. Conclusion-2

**Consensus seeking through an all-participant group debate may be an effective way to obtain a more objective representation of the firms' means of competing** (P2[7]). In each case of this study, the group of functional managers who first completed the assessments individually, successfully reached a consensus at the end of the group meeting—"success" being defined as the generation of a single table, listing one set of criteria for each product or market segment.

In academic terms, this kind of consensus-seeking may not have universal applicability. It would certainly be impractical (although desirable) in cross-sectional survey-based studies involving large sample sizes, to expect the functional managers to reach consensus before responding to a questionnaire. However, it could be used successfully in field-based studies, particularly in action research, where a more in-depth and holistic approach is required. In would be logical to state that since this kind of consensus-seeking could consume considerable amount of research time, the number of sites (replications) that could be included in each study of this kind would be limited.

The benefits for practitioners, on the other hand, are much more obvious. Sharing of the individual assessments, observation of data from other sources, and a multifunctional debate culminating in an agreement on the means of competing, would set the stage for the eventual development of a strategy which provides congruity among functions. One question that could be raised at this point is: if the participants in each case were re-surveyed individually after such group meetings, would their assessments differ to a lesser degree? This question is addressed in further research, section 6.4.

Apart from the benefits, however, some evidence exists in this study that reaching consensus, in real-life organizational settings may, in some cases, be a tenuous and temporary outcome. For example, the sales manager in case A, although agreeing to "go along" with the consensus assessment for the OTC products (in which price was not assigned any weight), wanted to go on record with his view that price was an order-winner in that segment (section 4.2.7). Whether this mild dissent would derail any future strategy formulation and implementation efforts

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[7] **P2** - Once the views of key functional managers on the firm's qualifiers and order-winners have been individually recorded, and if found to differ from each other, the differences should be resolved through consensus in a group setting.

in that firm is unknown. Another cause for caution is the risk of one, and most likely the highest-ranking, manager dominating the group discussion, and more importantly, unduly influencing the final assessment, as was observed in case C. Whether those managers, whose views may have been suppressed by the dominating executive, would subsequently try to undermine the implementation of the strategy that is based on the "consensus," is also unknown, and outside the scope of this study.

### 6.1.3. Conclusion-3

**Pre-selection of the criteria to be assessed, and their confinement to an external (market-based) orientation, afforded the process a repeatable structure and consistency in the conceptualization of the constructs** (P3; P4[8]). While the participants were given the flexibility to modify the list of criteria, the existence of a pre-selected set as a starting point served as a pool of examples, and helped them to more easily comprehend the concepts of qualifiers and order-winners. As table 5.4 illustrates, all of the participant-suggested criteria were non-generic, and had external orientation (also see discussion in sections 5.1.3, and 5.1.4).

One cannot conclude, however, from this study alone, that the consistency by which the orientation of the criteria was expressed in fact led to the identification of a more accurate set of competitive factors than would have been achieved had the criteria been a mix of external and internal. Nevertheless, the participants' quick adoption of this approach, and their success in keeping the consistency throughout the study, may be an indication that being conscious of the internal vs. external distinction, and using exclusively external criteria, can be a pragmatic way to achieve conceptual consistency in plant-based strategy process research. As for practitioners, keeping the criteria consistently external at this stage of the process would serve as a useful first step in subsequently linking their firms' internal capability building efforts to those external market drivers. This conclusion is based on the observations in three of the cases in which the managers highlighted the need to subsequently translate those external factors into manufacturing terms, i.e., deriving the manufacturing tasks which best support the stated qualifiers and order-winners. This

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[8] **P3** - Using the traditional four generic criteria, as commonplace in existing literature, is not sufficient to capture the uniqueness of each company's situation. A more comprehensive list of factors is necessary to provide participants with a wide range of choice and discriminating power.
**P4** - The use of criteria which are expressed in market-related terms focuses attention on external factors (instead of internal capabilities), thus providing clarity and consistency for participants.

represents an important implication which was not initially expected, and is highlighted later in this and in further research sections.

### 6.1.4. Conclusion-4

**The all-inclusive nature of the study's approach to market segments, product groups, or customer types, in assessing each firm's means of competing, exposed the multitude of market demands the companies faced** (P5[9]). This contrasts the common practice in majority of published studies in which the assessments are based on the firms' primary product line. By uncovering the diversity of market segments or customer types served by the companies, and exposing the multitude of market factors imposed by those segments, it is easy to recognize the risk of excluding all but the primary product lines from the study. An obvious problem with such an analysis would be the determination of the "primary" product line. Would the selection criterion be the product with highest sales, the most profits, or largest production volume? Furthermore, if the selection is made based on, for example, sales volume, the product with highest sales may only represent, for example, 40% of total company sales. All other products, each having less than 40% of total volume, but together comprising 60% of sales, would be left out of the assessment. Another problem may arise if two different managers in the same company, responding to a mailed questionnaire on competitive criteria, refer to two different product lines with similar volumes in their assessments. Issues of this kind, based on the results of this study, demonstrate the risk of restricting data collection to one or few products.

However, sufficient evidence exists in this study that including all product lines in the assessments also presents difficulties with segmentation. The way the products or markets are segmented, to a large extent, appears to determine the way in which the criteria weights are distributed among the segments. In other words, the final quantitative assessment of a company's product lines in terms of their means of competing is largely determined by the way those products are segmented (table-5.5 summarizes the market segments identified at various stages of the process). Different segmentation schemes used by different functional managers in cases D and E highlights this phenomenon (for a more detailed discussion, see section 5.1.5). In those cases the

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[9] **P5** - Basing the qualifiers and order-winners on each of the company's markets/product-lines exposes the diversity of demands firms face, and ensures that the companies' entire span of markets/customers is explicitly taken into account.

disparities were resolved during the final group meetings as the participants reached a consensus. Should functional managers fail to agree on a single segmentation scheme in other studies, establishing a clear understanding of the firm's qualifiers and order-winners would naturally become problematic.

### 6.1.5. Conclusion-5

**Other than the two occurrences in which the participants misidentified the nature of a specific criterion, the conceptual difference between qualifying and order-winning criteria was sufficiently understood and appropriately applied by the participants** (P6[10]), but only after the final group meetings. The wide disparity observed in the nature of several criteria at the individual assessment stage was one of the most troublesome aspects of this study. Frequent reminders, clarifications, and examples were provided by the researcher during the one-on-one interviews to ensure that the participants understood the differentiation and that their quantitative assessments were consistent with the statements they had made. Further guidance was also needed during the group meetings. It wasn't until the participants had the opportunity to hear each other's views and evaluate the supplementary data presented by the researcher that their comprehension of the distinction between qualifiers and order-winners improved—a situation which eventually led to the consensus.

This should be seen as a caution to researchers and practitioners. Conducting research or practicing strategy formulation by using operations strategy concepts and constructs with academic origins may not yield reliable results unless the definitions, and the subtle, yet important, distinctions among them are clearly understood by participants—a conclusion which supports the need for a shift towards field-based empirical POM research, and away from mailed questionnaires.

A logical question to ask at this point is: does differentiating between the two concepts really matter? What would, for example, company D do differently if price, in the haemodialysis market, is in fact a qualifier, rather than an order-winner as the participants have concluded? According to Hill (1994), companies should support the qualifiers at average market levels, and, once they achieve them, they should maintain their levels of performance. Order-winners, however,

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[10] **P6** - Differentiating between qualifying and order-winning criteria when assessing each product/market segment provides managers conceptual clarity and allows them to adequately prioritize the criteria.

Hill asserts, should be supported at levels better than competitors since those criteria differentiate the firm in the marketplace. By considering price as the only order-winner, company D may attempt to beat the competition by reducing the price of its haemodialysis products—a move which would most likely be matched by its competitors. This may result in significant loss of profits in this already low-margin segment. In terms of manufacturing implications, an unnecessary price reduction of this kind would inevitably translate into increased emphasis on reducing manufacturing costs, which may jeopardize performance in other measures such as quality compliance. Therefore it is logical to conclude that addressing qualifiers and order-winners in different ways would aid managers in focusing their resources on improving performance on those criteria which are more likely to increase sales.

### 6.1.6. Convergence of Conclusions: The Expanded Process Model

A further contribution of this research comes not only from individual conclusions reached through the testing of the initial propositions, but as importantly, from the convergence of those seemingly discrete findings into a linked and reinforcing set of components which together make up the expanded process model. This model, illustrated in figure-6.1, provides a useful and repeatable extension to existing literature.

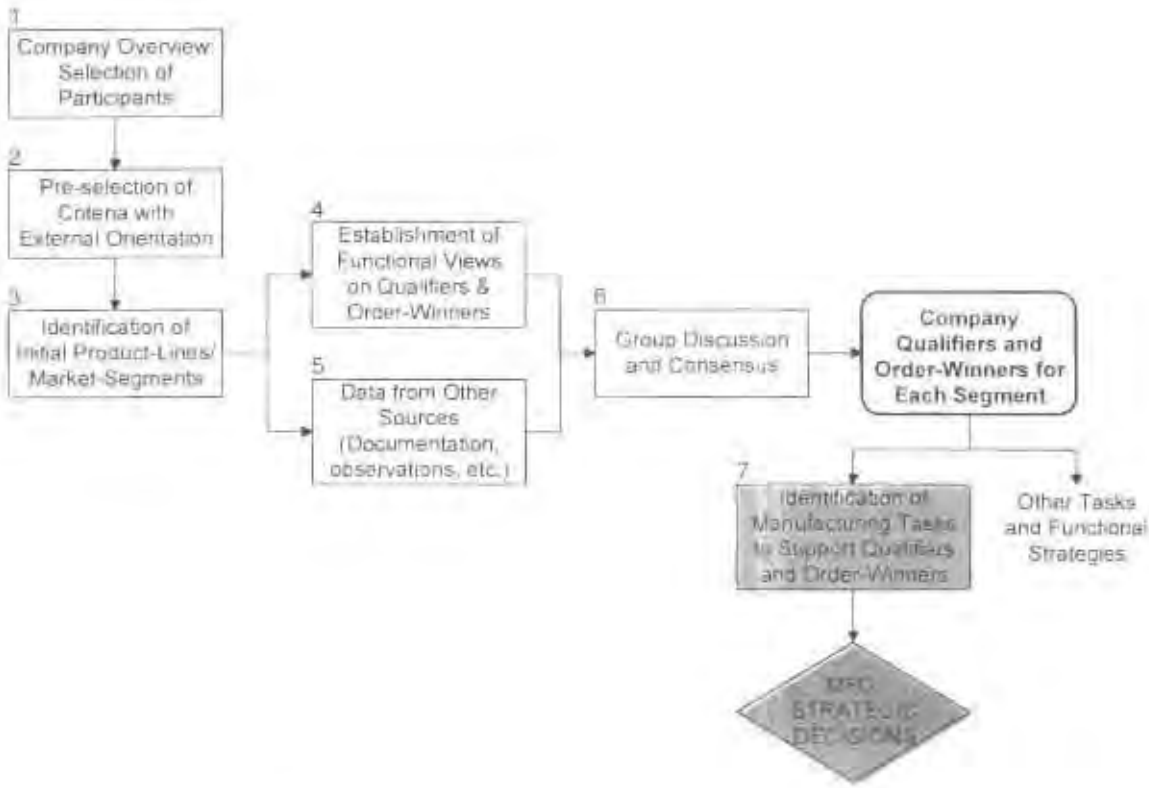


**Figure-6.1 The Expanded Process Model**

The first step, other than obtaining basic information about the company, involved the selection of the participants—a key decision by the highest-ranking executive in determining the major functions to be represented in the process. Each case included at least the manufacturing/operations, engineering/design/development, marketing, and sales functional heads. This ensured that the broadest range of perspectives were solicited—an important first step in data triangulation.

In step 2, pre-selection of market-based (external) criteria not only enabled all participants to start the individual assessment step with the same set of factors (providing within-case consistency in the process), but also furnished a common (market-based) language for all functions to relate to (rather than using internal, capability-based criteria with functional orientation). Identification of all product-lines or market segments of the firm, in step 3, was indicative of the holistic approach this study took, encouraging the participants to focus on the entire business.

Step 4 was central to this study's design. Solicitation of the functional perspectives sought to reveal participants' views, individually, in a non-threatening environment. Collection of the data in a standard format, and its subsequent compilation and presentation along with other observations and findings by the researcher (step 5), at the group meetings, proved to be a data triangulation tool for the managers in step 6. Seeing each other's responses, without being able to attribute any one list to any individual (names were removed from the graphs and tables), enabled the participants to examine the entire range of perspectives alongside their own. This aspect of the process has the potential to be a valuable step for practitioners planning to use the approach in the formulation of a manufacturing strategy. Other than uncovering the different angles of looking at a firm's markets, this technique sets the stage for a cross-functional dialogue among the managers, which could prove indispensable at subsequent stages of strategy formulation.

The external, market-based orientation of the criteria also brought to light the difficulty in directly using the agreed set of qualifiers and order-winners as the basis for formulating a manufacturing strategy. The process highlighted the need for translating those market-based factors into manufacturing terms—identification of manufacturing tasks—before attempting to evaluate the manufacturing strategic decisions. The addition of this step, shown in figure-6.1 as step 7, but not covered in this research, provided a valuable extension to the process model initially conceived.

In short, the process is designed to accommodate the idiosyncrasies of real-life organizational settings, as each step builds upon the learning from the previous steps, forming a structured, and repeatable, template for future researchers and practitioners.

The contributory and useful findings of this research, however, should not detract from the cautionary aspects of the conclusions. Strong evidence of functional incongruity in the firms studied may lead POM strategy researchers to take more notice of the risks associated with continued domination of empirical research in this field by survey-based methodologies. The obvious conclusion that more than one respondent must be used in survey-based studies is becoming more widely recognized. However, the additional indications from this study are that subjective views of functional managers, even when triangulated among themselves, are not sufficient; data from other sources, compiled and collectively discussed by the participants, is also necessary to obtain a full understanding of the firms' competitive factors. The strikingly different makeup of the final quantitative assessments, in relation to the individual managers' assessments in this research, stands as evidence of this conclusion.

Clearly the group of 55 primary participants from the five companies studied cannot be considered as representative of the overall population of functional managers in manufacturing companies. However, strong evidence from the cases indicates that even well-placed managers, with relevant education, industry experience, and access to professional development training in their firms, in some cases had difficulty making the market factor assessments necessary for a successful strategy formulation. Titles of participants ranged from manager and director, to vice president and president, and they represented a wide range of functions, such as manufacturing, marketing, and design, among others. A POM researcher's reasonable expectation from those sufficiently high-ranking officers would be that they be knowledgeable about their firms and the markets in which they compete, and therefore be in the best position to articulate how their firms' primary means of competing differ in importance. This study raises sufficient questions about at least some managers' ability to accomplish that task unaided, thus casting some doubt on the faith placed in them by researchers.

Implications of these findings for practitioners are also significant. The indications from this research are that, left to their own devices, functional managers, especially in companies without well established cross-functional approach to strategy formulation, may not possess the right knowledge, skills, or even see the need, to identify, translate, and incorporate the qualifiers and order-winners into a coherent manufacturing strategy. Whether the problem lies in the 'silo' approach to functional management that is pervasive in many companies (Hill, 1994), the absence of the "new breed" of manufacturing managers in sufficient numbers (Skinner, 1985), or the leadership and "business point of view" that are lacking in industrial management (Skinner, 1996), the fact remains: industrial managers need knowledgeable leaders and facilitators, as well as tested, documented, and practical tools to help them tackle the important and demanding task of developing a coherent manufacturing strategy. This research has been one attempt to providing the 'how-to's of a key part of that task.

### 6.2. Evaluation of Research Rigor

Of the four criteria most commonly pointed out in the literature for judging the quality of research designs, three are applicable to *descriptive* case studies such as this one: *construct validity, external*

*validity, and reliability.* The fourth, internal validity, is not addressed because it is used in causal studies only. (Yin, 1989)

**Construct validity** is concerned with the establishment of a sufficiently operational set of measures for the concepts being studied, i.e., not relying on the subjective judgements of a single source alone. A primary way in which construct validity was increased in this study was, as Yin (1989) suggests, *the use of multiple sources of evidence.* Although case research typically lends itself to collecting (or simply being exposed to) data from more than one source, using data triangulation to evaluate individual participants' responses and opinions was deliberately and systematically planned during the data collection stage in this research. Principal data collection techniques used in this study were unstructured, semi-structured, and structured interviews, documentation, direct and participant observations, and facilitated group discussions (see section 3.4.1, and table-3.2).

A second tactic used for improving construct validity was the establishment of *a chain of evidence.* (Yin, 1989) This was carefully documented in this thesis report as follows: The steps defined in the study protocol were derived from the research propositions developed from the literature. The case descriptions have been structured to closely follow the steps in the study protocol and the outcomes obtained from the cases (the left column summarized the actual results, and the right column revealed further details, added background information, and analyzed those outcomes with the aid of data obtained from other sources). The tables included in appendix-II illustrate the individual and group assessments, lending quantitative support for the outcomes and the analysis conducted. Finally, the discussion chapter (5) examined the outcomes in more detail and investigated cross-case patterns, all the while making frequent cross references to the relevant case descriptions. Other appendices include examples of additional documentation, and more importantly, of various research instruments developed and used throughout the study, such as introductory letters, survey form, group meeting presentation graphs, etc. This allows readers, and other researchers, to follow each conclusion through the chain of evidence that was created and evaluate the results.

**External validity** is the degree to which the findings are generalizable outside the immediate case study. In statistically-based empirical studies, the researcher is interested in determining the prevalence of a certain phenomenon in a large population. By using statistical sampling, he or she

surveys the smaller group, and generalizes the findings to the entire population. In case studies, on the other hand, and in action research, the method of generalization is *analytical generalization*, in which a previously developed theory is used as a template with which to compare the empirical results of the case study. External validity is achieved through a replication logic using multiple cases, such that each case confirms or disconfirms the theoretical proposition(s) used as the starting point in the study. If two or more cases are shown to support the same theory, replication may be claimed. Those results are therefore generalized to some broader theory.

In this research, five in-depth cases were used to test the six theoretical propositions derived through literature search. In addition to in-depth, within-case analyses, extensive cross-case analysis was conducted, through which those propositions were modified, extended, or new theories developed.

**Reliability** refers to the repeatability of the study by other researchers and aims at minimizing errors and biases in it. Gummeson (1991) states that achieving high reliability ensures that two or more researchers studying the same phenomenon with similar purposes reach approximately the same results. One of the ways in which this was achieved in this study was through *the use of a study protocol* (field procedure). It consisted of a written, structured sequence of activities which described the types of participants to be sought, examples of opening and follow-up questions to be posed during individual interviews, a basic list of essential data to be collected from each site, how the data is to be evaluated, and how to conduct the final group meeting and conclude the site visit. The protocol, while giving future investigators flexibility to accommodate idiosyncrasies of individual cases, provided sufficient structure and detail to ensure repeatability.

Interestingly, Yin (1989) sets a higher standard for achieving high reliability in case research. He contends that the objective of the test for reliability is:

> "... to be sure that, if a later investigator followed exactly the same procedures as described by an earlier investigator and conducted the same case study all over again, the later investigator should arrive at the same findings and conclusions. Note that the emphasis is on doing the same case over again, not on replicating the results of one case by doing another case study." Yin (1989: 45)

This condition is difficult, if not impossible, to satisfy in action research. The problem that is created by this requirement is that in an action research case once the change element or intervention is introduced, its impact on the subject(s) is examined, and the case is concluded, the subject and the context have been altered. Therefore a future investigator cannot re-introduce the same intervention in the same case. To take the example of this study, once the participants in each case have been exposed to all the process steps, and reached consensus at the end of the group meeting, the initial diversity of individual views—a major premise of this study—cannot be duplicated by another researcher at the same company at a later time. Therefore Gummeson's (1991) definition stated above was seen as appropriate to evaluate reliability in this study.

Another tactic used to increase reliability in this research was the utilization of *a chain of evidence* (see construct validity above). The principle was to allow an external observer to follow the derivation of any evidence from initial research questions to ultimate case study conclusions.

### 6.3. Study's Limitations

Two of the most obvious limitations of this study, interestingly, stem from one of its strengths: its reliance on multiple sources of evidence. This characteristic, as an important benefit of this research, was sufficiently covered in chapters 2 and 3. The first limitation is the investigation's dependence on the willingness of the company executives to furnish internal documents and allow access to its key managers for unstructured interviews and observations. Since the examination of documentary evidence about the firms' qualifiers and order-winners, and their screening for relevance, are parts of a key step in the process, the amount, type, and quality of the data obtained would play an important role in the success of other studies of this kind. Naturally, this researcher's being an employee in companies A and E allowed practically unlimited access to those sources. This may limit future researchers who are not also practicing managers. As for the cases in which this researcher was an outside investigator (cases B, C, and D), the quality and consistency of the analysis was maximized by requesting a predetermined list of documents (described in the field procedure, section 3.5) from each firm. In cases where some of those sources did not exist (smaller firms, e.g., case B), more probing was done through additional unstructured interviews and observations with participating and other employees.

The second limitation which stems from the aspect of multiple sources in this study is the exclusion of two other potential sources of evidence. The first of those relates to Hill's (1994) assertion that the real clues for a company's qualifiers and order-winners come from examining the actual orders placed by customers. This was not attempted in this study because of the unavailability of such documentation in firms manufacturing standard products that are made to stock (cases A, D, and E). In those cases customers' orders consisted of routine computerized printouts simply listing company name, address, products, and quantities—no written contracts were drawn. In the remaining cases (B and C) the owner-presidents indicated their reluctance to allow the close scrutiny of such documents for confidentiality reasons. The second potential source of evidence not used in this study was the direct feedback from customers. An additional, and carefully designed, data collection step could have sought each customer's views on those criteria. This was not attempted because the scope of the study, as defined at the outset (section 1.5), was to solicit the views of a range of managers and to combine those with data from other sources available *within* the firms (see further research, section 6.4).

Another limitation relates to the methodology used in this study, and specifically its action science nature. As discussed in detail in section 3.3, action research involves the introduction of a change to a subject (in this case an organization), observation of its impact, and derivation of conclusions. This makes the method more interventional than other empirical research designs, and, predictably, less desirable for managers in other potential research sites. Their willingness to participate may be impacted, to a great extent, by the expected benefits of the intervention. Exposing functional differences in views, and attempting to resolve them in a group setting, may not be compatible with every firm's management style and culture. The perceived benefits of the intervention must outweigh the top manager's uneasiness with the potential negative impact of this exposure—a balance which would inevitably be impacted by the researcher's background and grasp of the issues under study. A researcher that is knowledgeable in the field and who can convey this competence to the access person in the firm (primarily during the first meeting in which the firm's participation is requested), would more easily obtain the support of the firm. This researcher's background in operations management which spanned over 18 years, and the responsibilities in his position at the time the research was conducted (which included the task of facilitating the formulation of operations strategies), were instrumental in gaining the firms' trust. This may limit

future researchers who do not possess these qualifications, and is consistent with Yin's (1989) assertion that "in case studies, there is little room for the traditional research assistant." (p. 62)

Another limitation is that although the solicitation of the views of multiple functional managers from each firm and the demonstration of differences was one of the key aspects of this research, *inter-rater reliability* or *agreement* were not quantitatively measured[11]. Consistent with the action research orientation of the study, the option given the participants to add/delete/change the pre-selected criteria meant that the constructs did not remain consistent across participants to allow statistical measurements to be taken. While the quantification of the degree of agreement among managers would have provided an interesting angle, the flexibility given the participants could not have been sacrificed in this study.

Finally, the number of cases (5) can be considered as limiting. Although there is no "correct" number of cases for a multiple-case study, and that the number five falls within the ranges recommended by Eisenhardt (1989) and Meredith (1998—see section 3.4.3), eight to ten cases could be seen as a more appropriate number. However, as Glaser and Strauss (1967) and Yin (1989) suggest, once the saturation is achieved (the point after which no significant new knowledge is being generated), the benefits of additional cases may be minimal.

### 6.4. Further Research

The primary purpose of this research was to study the *process* aspect of manufacturing strategy formulation. Not unexpectedly, the real-life organizational nature of this study also revealed future research opportunities about the *content* of strategy making. This section, therefore, suggests further research in both of those aspects.

First, the nature of functional differences observed in this study could be further investigated in future studies in the following ways.

[11] These are statistical measures of the degree of consistency of variance, and interchangeability, respectively, of responses provided by multiple raters in an organization (Boyer and Verma, 1999).

- By keeping the pre-selected set of criteria fixed throughout the individual quantitative assessment process, inter-rater reliability and agreement could be quantified, providing a more objective measure of existing strategic coherence within the firm. Those results could further be extended to compare them with the consensus assessment, thus evaluating the extent to which the results of the group discussions differ from those of the individual raters (for a review of common methods for assessing the degree of multiple rater reliability and agreement, see Boyer and Verma, 1999).
- The impact of the final group meeting on the initial disagreement among functional managers can also be tested by re-administering the individual survey after the group meeting (but before the generation of the consensus table). The two results can be compared to determine whether the group discussions and the presentation of data from other sources do in fact lead to a higher degree of agreement among participants when re-surveyed privately.
- Inter-rater reliability and agreement measures could also be used in examining the propensity of specific functions to rate specific criteria higher. For example, do sales managers tend to rate price higher than other functions in different companies in the same industry or market? Are manufacturing managers more likely than other managers to consider quality to be a qualifier? Answers to those questions may expose functional biases inherent in firms from similar industries.
- Some evidence exists in this study to indicate a tendency of sales and marketing managers to segment their firms' markets in different ways (by customer type, and product type, respectively). Future studies may investigate the presence of this and other functional biases in market segmentation, and their impact on the way those participants rate the criteria within those segments.
- An added dimension to examining the perspectives of various sources would be to seek the input of the customers. Naturally, such an inquiry, combined with all the sources used in this study, would expand the scope and significantly increase the time demand on the research. Future investigations seeking direct input from the firms' customers may counter this increased time demand by reducing the number of cases.

The group discussion stage of the process in cases A and E, which are sister business units (in U.S. and Canada) of the same corporation, manufacturing and marketing the same brand name products, revealed dissimilar consensus assessments for identical groups of products. Although several reasons for the dissimilarity are probable (true differences in the market demands for those products in the two countries; the makeup of the participants; other organizational dynamics; or simple semantics), none could be proven by the evidence available in this study. Future studies may attempt to investigate this phenomenon. Suitable for this kind of research would be multinational corporations with "global brands" that are manufactured and marketed in multiple countries or regions. Local marketing, manufacturing, and other functions in each of those countries or regions could participate in a study similar to this one, and differences in final assessments, if any, could be investigated through follow-up studies.

The distinction between market-based external criteria (qualifiers and order-winners) and capability-based internal criteria (manufacturing tasks), as well as the links between the two types, have not been sufficiently addressed in the OM literature. The only serious attempt in differentiation has been by Swink and Hegarty (1998) who separate those constructs into three groups: *product differentiation* (the basis of competition), *manufacturing outcomes* (product attributes that reflect manufacturing performance measures), and *manufacturing capability* (core capabilities supporting the manufacturing outcomes). They then propose a series of complex linkages among those three levels of constructs. This study uncovered the need to simply translate the market factors (i.e., qualifiers and order-winners) into capabilities the manufacturing function must emphasize in supporting them (i.e., manufacturing tasks). Future studies may try to investigate the presence of direct links between those two types of constructs. For example, separate investigations could be conducted with manufacturing and marketing/sales functions; the former can be asked about (triangulated by data from other sources) the exclusively manufacturing-based criteria being emphasized, and the latter, about the external, market-based criteria (qualifiers and order-winners). The presence or absence of links between the two can then be established. To achieve this, however, more research is needed to better understand the supporting relationships between specific manufacturing tasks (e.g., lead-time reduction, volume flexibility) and means of competing (e.g., delivery speed, broad product range).

Finally, delineation among the customer hierarchies was highlighted in each case, and their varied influence on the qualifiers and order-winners was demonstrated specifically for cases A and

E. The question of which customer's point of view to take when assessing a firms' means of competing was resolved by considering all stakeholders (customer levels) together in each case of this study. Identification of the various levels of customers, assessment of the means of competing separately for each level, and examination of the interaction among them, could be introduced in future research as a modification to the process model developed and refined in this study.

## CONCLUDING REMARKS

It would be safe to assume that the ultimate goal of any operations executive is to demonstrate superior performance in key manufacturing measures and positively impact his or her company's profitability. It is also widely accepted that understanding the company's important competitive factors, and supporting, better than competitors, those criteria which will win more orders would contribute to the firm's success. Thus, an inquisitive question to ask at this point would be: *does this process reveal a firm's "real" market qualifiers and order-winners?* After all, the process model applied in this study involved one-on-one focused interviewing to draw out functional managers' views and knowledge (both of the markets and of their firm), extensive data collection from other, and more objective, sources, and group discussions to help participants reach a consensus—all worthwhile endeavors intended to generate higher levels of comprehension in the firm. However, despite the broad-based functional participation and extensive data triangulation, managers appeared to have made the "wrong" assessment in at least two instances.[12] Does this invalidate the entire approach? Was the considerable time investment in interviews, data triangulation, and group discussions worth the results that were achieved? Instead, would a knowledgeable, yet authoritarian, manufacturing executive have achieved the same or better congruency between the operations and business strategies had he or she dictated, based on his or her own views alone, the competitive criteria to be supported by operations?

Needless to say, it wasn't the focus of this study to make comparative assessments of this sort. However, not only does the task of implementing the manufacturing strategic decisions derived from those criteria squarely fall on the individual functional managers, but it is those managers' pattern of day-to-day decisions that constitutes the emergent manufacturing strategy.

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[12] The assessments in those instances were wrong based on the internal and external data available and this researcher's judgement (see section 5.1.6). No intervention was made to correct the participants during the group discussions.

How well those managers understand their firms' means of competing, how they link them to specific manufacturing strategic decisions, and the extent to which the managers buy into those decisions, all greatly impact the success of the strategy implementation. The high degree of involvement this process afforded the managers, as well as the learning that occurred during the group discussions, were all positive steps towards achieving the right conditions for a coordinated and congruent operations strategy.

Furthermore, it may be difficult, if not impossible, to know with certainty, what the "correct" qualifiers and order-winners for a firm are in absolute terms. One cannot measure, on an absolute scale, "how much" of an order-winner say, "ability to provide a wide product range" is. To make things worse, whether a criterion is a qualifier or an order-winner, based on Hill's (1994) definitions, depends on knowing what the "industry average" is, and how the firm's performance on a specific measure compares to that average. This requires a serious benchmarking effort which many companies may not have resources for. Changing market conditions, shifting customer preferences, and raising expectations, invariably add to the complexity. Nevertheless, operations and other executives are expected to seek out reliable data and use it to make informed decisions. However, in the absence of clear benchmarks, many of those decisions have to be made by using high levels of knowledge and good managerial judgement. A structured, well documented, and interactive approach goes a long way towards providing the necessary inputs for that effort.

The process model applied in this research has not been pursued as another panacea, but as a much needed tool for practicing operations managers who desire to make a positive contribution to their firms' success, even though the tool may require knowledgeable facilitators to push the process through. This documented process took a holistic approach, encouraging the executives, and other researchers, to get close to the business, to manufacturing plants, and to their employees, in generating the richness and depth in data collection and analysis—all necessary attributes of good management and good academic research.

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# APPENDICES

## List of Appendices

**APPENDIX-IA**

## A typical introductory letter given each participant prior to the individual interviews.

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**McNEIL**

**TO:** List **DATE:** February 5, 1997

**FROM:** Rafael Menda **COPIES:**

**SUBJECT:** **The New Operations Strategic Planning Process**

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As you may already know, we are revisiting the process we use in developing our operations strategy. The objective of this process is to develop an **integrated** Operations Strategy which is **linked to the markets**. We will approach this process in a stepwise fashion, a summary of which is provided at the end of this memo.

This introductory letter is intended to give you an overview of the background to our approach, the context from which the new process is derived, a discussion of the steps to be taken, and project timelines. Your input into this process is key. Please familiarize yourself with the process and the survey form (attached), which will become useful during our upcoming interviews and discussions.

**McNeil and the New Operations Strategy**

Business strategy can be examined at three levels. Operations strategy is one of the **functional** strategies (level-III) that should be derived from the **operating company** strategy (level-II), which, in turn, is derived from the overall **corporate** strategy (level-I). In contributing to the company's strategic objectives, the Operations function must provide coordinated manufacturing and logistics support for the **ways in which products qualify and win orders** in the marketplace, at levels better than its competitors. The success of this is determined by the degree to which the operations function **matches** its asset and organizational system decisions to those criteria that win orders.

McNeil is a market-oriented company; i.e., our primary expertise is our ability to understand and respond effectively to the needs of specific markets, classes of trade customers, or consumer groups. The Marketing function's strategy directly addresses our company's response to the fragmentation and dynamism associated with those varied groups. Therefore, we conclude that our Operations strategy must also be formulated with those specific needs in mind.

Our mission is, therefore, to develop a better link between our Operations and Marketing strategies using a unique framework, and, as a result, **better align** manufacturing with the needs of the markets. In order to create this essential interface, it is necessary to provide the business with an understanding of its markets from the viewpoint of manufacturing, as well as marketing. We will start this by asking the Marketing and Sales functions questions about the markets, the answers to which will subsequently be translated into manufacturing terms. One of the key steps in accomplishing this is distinguishing how different products qualify and win orders in their respective markets.

**Qualifying and Order-winning Criteria**

These are the factors that various functions must provide, better than the functions of competitors, in order to enable the products/services of the firm to win orders in the marketplace. Examples are *price; delivery speed; quality conformance; innovative products.*

Typically companies may make the assumption that all products within the business have similar order-winners because they have similar names, are sold to similar customers, or belong to the same product segment from the viewpoint of marketing. However,

(1) products may win orders in different ways from one another,
(2) they will typically have more than one order-winner,
(3) the order-winners may change over time, and,
(4) different order-winning criteria are supported by different functions.

Our first step in developing an integrated operations strategy is to identify those criteria which Operations must support. During this step, we will be attempting to distinguish between two subtle, but important, forms these criteria take: (1) **qualifiers** - those factors that get and keep companies in markets (these need to be supported at market levels); (2) **order-winners** - the criteria which enable companies to finally win the actual orders (these should be provided at levels better than competitors).

**Steps in the Development of the New Operations Strategy**

Our framework comprises five major steps.

1- **Review of corporate** (business unit - McNeil) **strategy/objectives**
2- **Analysis of marketing plans** (by brand)
   - Complete review of published brand business plans
   - Examination of available market data; analysis, trending
3- **Establishment of qualifying and order-winning criteria**
   - Survey of key Marketing and Sales staff (sample attached)
   - Survey of key Operations staff
   - Multifunctional group meetings to reach consensus
4- **Operations Strategy - asset decisions**
   - Review of overall, and plant-specific manufacturing data; analysis and trending
   - Analysis of consensus on market needs, and their impact on operations
   - Development of asset strategies in-line with market needs
   - Focusing of plant missions on market needs
5- **Operations Strategy - organizational development and systems decisions**
   This involves the realignment of systems and business processes with the identified market needs and established plant missions.

**Project Timing**

Steps 1 and 2 are complete. We have started conducting interviews with key Marketing, Sales and Operations staff. Following several group meetings to reach consensus on the market criteria, extensive reviews of plant data, and discussions with key Operations and plant staff, we will be developing our operations strategic plan during May and June.

# APPENDIX-IB

## An example survey form used during individual interviews

### McNeil Consumer Products Co.

***"QUALIFYING" AND WEIGHTED "ORDER - WINNING" CRITERIA FOR REPRESENTATIVE PRODUCTS***

In order to create the necessary interface between marketing and manufacturing, it is necessary to distinguish how different products qualify and win orders in their respective markets. Typically products win orders in different ways from one another, may have more than one order-winner, and those may change over time. This process will enable our company to have a clearer view of what it requires manufacturing to provide for competing effectively.

**INSTRUCTIONS:**

- The set of criteria presented below combines the order-winners from the immediate customer's and the end-user's points of view. Although some criteria are applicable to both, some others may be unique to one type of customer.
- First identify (with a "Q") the criteria which currently qualify our company to be a supplier of the specific brand/product.
- Then assign a percentage to those other criteria which enable us to "win orders" in the marketplace.
- Repeat the above two steps for the future time period (qualifiers and order-winners may or may not change over time).
- Please note that a specific criterion cannot be a qualifier and order-winner at the same time. Qualifiers are not weighted; however, the sum of values assigned to the order-winning criteria should be 100.
- Please resist the temptation to assign equal values to each order-winner. Also do not feel that every criterion has to have a value other than zero. Remember, our objective is to distinguish among those factors our company must provide better than competition.
- The list provided below is not exhaustive. Please feel free to add any other criteria as you think relevant to your products. (examples of other dimensions are: "being an existing supplier; "custom product design"; "after-sales support")

| | BRANDS / PRODUCTS | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **CRITERIA** | | | | | | | | |
| Price | Today | +2 years | Today | +2 years | Today | +2 years | Today | +2 years |
| Delivery - Speed | | | | | | | | |
| Delivery - Reliability | | | | | | | | |
| Quality Conformance | | | | | | | | |
| Product Innovation | | | | | | | | |
| Broad Product-Range | | | | | | | | |
| Value-added Features/Services | | | | | | | | |
| New Product Time-to-Market | | | | | | | | |
| Product Performance | | | | | | | | |
| Package Leadership | | | | | | | | |
| Trade Relations | | | | | | | | |
| Brand Image | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

## Definitions for Criteria Used in Survey Forms

**Price**
The extent to which products qualify or win orders on the basis of being the *lowest-priced* product in the market. The rule of thumb is, if the product/brand is "price-competitive", it is a *qualifier*; on the other hand, if the product is "competing on price", then the criterion is an *order-winner*.

**Delivery Speed**
Delivering (on an on-going basis) at lead times *shorter* than competitors.

**Delivery Reliability**
Competing on the basis of *on-time* and *complete* deliveries, provided that the delivery speed is within market averages.

**Quality Conformance**
Ability to meet, consistently, the established quality specifications.

**Product Innovation**
Competing on the basis of new and innovative products which competitors cannot duplicate in the short term.

**Broad Product Range**
Qualifying or winning on the ability to provide a broad product range which may enable the customers to do "one-stop shopping."

**Value-added Features and Services**
Providing specific benefits, besides the product, to direct customer or end-user (e.g., 1-800 line; category management, etc.)

**New Product Lead-time-to-market**
The extent to which products establish themselves by being first in the market.

**Product Performance**
Ability to design products with performance superior to competing products.

**Package Leadership**
Competing on the basis of unique/innovative packaging, rather than the product itself.

**Trade Relations**
Being an existing and preferred supplier; forging partnerships with customers.

**Brand Name**
Capitalizing on the established image and market share of the brand(s).

## APPENDIX-IC

### Framework for a typical unstructured interview of manufacturing personnel and observations on the shop floor.

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- During the plant tour, and if necessary, during subsequent plant visits, observe and record at least the following points:
  - type of processes (jobbing; batch; etc.)
  - layout of primary processes
  - degree of automation in material handling
  - degree of process automation
  - visible amounts of buffer stocks between work-centers
  - extent of documentation
  - types of performance measures being tracked (at the workstations and bulletin boards)

- Ask to be introduced to non-managers on the shop-floor. Typical personnel to interview would have such titles as: production supervisor; shop foreman; shift supervisor; head mechanic/ technician; production engineer; etc.

- During the plant tour, or a subsequent, pre-arranged visit to the floor, conduct unstructured interviews with one or more of the above personnel. Keep the conversation casual, flexible and respectful of the individual's time commitments on the shop-floor. Typical questions during the interview would be as follows:

  - How many different products do you make in this plant?
  - Do you introduce a lot of new products every year?
  - How often do you changeover [a particular] equipment?
  - Do you get a lot of rush orders?
  - Are you asked to change scheduling priorities often?
  - Who are your main customers?
  - Do the demands from your customers vary?
  - How does your company compete in the marketplace?
  - Why do your customers buy from you?
  - What should the company do to get more sales and more customers?
  - Do you think your company is well-equipped to take on your competitors?
  - Which performance measures does your management emphasize the most?
  - Do you think they should pay more attention to other measures?
  - What kind of improvements have you been working on in the past one year?

- Thank the personnel.

**APPENDIX-ID**

**Agenda for a Typical Final Group Meeting**

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## BDH Inc.

## GROUP MEETING AGENDA

- Overview of Operations Strategy Formulation
  - Characteristics of Markets versus Manufacturing
  - The need for Congruency
  - Steps for Strategy Formulation
  - Market Qualifying and Order-Winning Criteria
- Research Objectives and Methodology
- Presentation of Data Collected
  - Functional Views
  - Summary of Other Data
- Discussion and Consensus
- Questions and Conclusion

## APPENDIX-IE

**Example of a summary report provided to the primary contact after study completion.**

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***Shirlon Plastics Inc.***

**DETERMINATION OF ORDER-WINNING/QUALIFYING CRITERIA**

**Summary Report**

***Prepared By:*** *R. Menda*

*March 1, 1996*

The assignment, as part of a doctoral research project, provided a look at Shirlon's markets that is different from the ways markets are traditionally evaluated. It consisted of a series of individual interviews with key managers in the company, examination of available company documents, observations on the shop floor, and a final group discussion, during which each market segment was debated in terms of its order winning and qualifying criteria. Key questions asked were: "What characteristics qualify you as a supplier in this market?"; "How do you finally win the orders?"; "Would emphasizing [a certain criterion] enable you to win more orders from this customer?"

The objective of the research was to answer the question "how can managers of a manufacturing firm go about determining the qualifying and order-winning criteria for their products?" Shirlon Plastics Inc. participated in this research as one of five case studies.

Attached are a summary of the Operations Strategy Overview I presented, the results of the individual quantitative assessments, and the outcome of the final group meeting (attachments 1 through 3). As we discussed, the consensus reached at the end of the debate revealed eight segments, each belonging to one of the four originally identified market segments, and displaying a unique mix of criteria of varying importance. Each of these segments would require varying manufacturing responses.

The next steps for Shirlon would be: (1) assess manufacturing's current capabilities, and realign them to provide the right responses for those markets (improve on those measures that matter); and (2) conduct similar market debates periodically to spot any shifts, and particularly to evaluate new markets as you prepare to enter them. It should be remembered that **strategic advantage** is best achieved when:

1- competitive capabilities are well *linked* to the markets,

2- the *relevant* performance measures are identified and defined, and

3- the objectives are clearly *disseminated* to each worker.

I would, once more, like to thank you and your employees for your cooperation, the generosity with which you made your time available, and your patience. I hope this exercise was as beneficial to you as it was to me. I wish you and your company continued success in the marketplace.

# OPERATIONS STRATEGY OVERVIEW

- A company's markets are typically varied
- Companies typically have a single manufacturing facility, with one set of processes and a common infrastructure

TRADITIONAL ASSUMPTIONS ARE:

- Within a given technology, manufacturing is able to do everything
- Manufacturing's contribution is the achievement of efficiency rather than effective support of market needs

However,

- MARKETS are inherently dynamic
- "They change if you want them to or not"

- MANUFACTURING is inherently fixed
- "It won't change unless you deliberately change it"

| Doing things right: | | Doing the right things: |
|---|---|---|
| EFFICIENCY | vs. | EFFECTIVENESS |

- "Distilling" the essence of the markets (sort out what is important)
- It is the consistency between markets' needs and operations tasks that provides effectiveness.

**HOW:** Through a market debate

Manufacturing asking marketing questions about the markets, requiring manufacturing answers.

## STEPS FOR OPERATIONS STRATEGY FORMULATION:

- Segment the markets to understand them
- Identify the specific needs of those markets (order winners and qualifiers)
- Determine how well manufacturing's current performance supports its markets
- Make the necessary adjustments to prioritize manufacturing's strategic response
- Marketing and manufacturing perspectives to be fed into each other

• **Qualifiers** enable companies to get into and stay in specific markets.
They should be provided at market levels.

• **Order-winners** enable companies win more orders in the markets in which they compete.
They should be provided at levels better than competitors

Example: PRICE

If you are "price competitive"
it is a QUALIFIER

If you are "competing on price",
it is an ORDER-WINNER

***Shirlon Plastics Inc.***
**ORDER-WINNING/QUALIFYING CRITERIA**
**Summary of Responses by Function**

R.V. PRODUCTS

| Criteria | Marketing | Sales | Design | Prod'n | Extr. Mgr. | MEAN |
|---|---|---|---|---|---|---|
| Product Functionality | 5 | 0 | 15 | 60 | | 20 |
| Delivery Reliability | Q | 40 | 15 | 20 | | 19 |
| Quality Conformance | Q | 60 | 15 | 0 | | 19 |
| Existing Supplier | 75 | 0 | 0 | Q | | 19 |
| Price | Q | Q | 20 | 20 | | 10 |
| Delivery Speed | 0 | 0 | 15 | Q | | 4 |
| Technical Support | 0 | Q | 15 | Q | | 4 |
| Unique Product Design | 15 | 0 | 0 | 0 | | 4 |
| Product Range | 5 | 0 | 0 | Q | | 1 |

CUSTOM PRODUCTS

| Criteria | Marketing | Sales | Design | Prod'n | Extr. Mgr. | MEAN |
|---|---|---|---|---|---|---|
| Quality Conformance | Q | Q | 33 | 60 | | 23 |
| Delivery Reliability | Q | 20 | 33 | 30 | | 21 |
| Product Functionality | 30 | 50 | 0 | Q | | 20 |
| Existing Supplier | 70 | 0 | Q | Q | | 18 |
| Technical Support | Q | 30 | 0 | 10 | | 10 |
| Price | Q | Q | 33 | Q | | 8 |
| Delivery Speed | 0 | 0 | 0 | Q | | 0 |
| Product Range | 0 | 0 | 0 | 0 | | 0 |
| Unique Product Design | 0 | 0 | 0 | 0 | | 0 |

MUNICIPAL PRODUCTS

| Criteria | Marketing | Sales | Design | Prod'n | Extr. Mgr. | MEAN |
|---|---|---|---|---|---|---|
| Unique Product Design | 50 | 70 | 60 | 60 | | 60 |
| Price | Q | Q | 40 | 30 | | 18 |
| Quality Conformance | Q | 20 | 0 | 10 | | 8 |
| Product Range | 20 | 0 | 0 | 0 | | 5 |
| Delivery Speed | 15 | 0 | 0 | Q | | 4 |
| Product Functionality | 15 | 0 | 0 | 0 | | 4 |
| Delivery Reliability | Q | 10 | 0 | Q | | 3 |
| Technical Support | 0 | 0 | 0 | Q | | 0 |
| Existing Supplier | Q | 0 | 0 | 0 | | 0 |

HOME & GARDEN PRODUCTS

| Criteria | Marketing | Sales | Design | Prod'n | Extr. Mgr. | MEAN |
|---|---|---|---|---|---|---|
| Price | Q | 50 | 50 | 60 | 50 | 42 |
| Existing Supplier | 50 | 0 | 0 | 0 | 50 | 20 |
| Delivery Speed | Q | 30 | 30 | Q | Q | 12 |
| Product Range | 20 | 20 | 20 | Q | Q | 12 |
| Delivery Reliability | Q | 0 | 0 | 40 | 0 | 8 |
| Product Functionality | 20 | 0 | 0 | Q | Q | 4 |
| Unique Product Design | 10 | Q | 0 | Q | 0 | 2 |
| Quality Conformance | Q | 0 | 0 | Q | Q | 0 |

## *Shirlon Plastics Inc.*

**Order-winning and Qualifying Criteria for Each Market Segment**

(Consensus Assessment)

| Criteria | RV PRODUCTS | | CUSTOM PROD. | HOME & GARDEN PR. | | | MUNICIPAL PRODUCTS | |
|---|---|---|---|---|---|---|---|---|
| | | | | Garden Hose | | Lawn&Garden | | |
| | OEMs | Aftermarket | Bombardier/Carrco | Existing | New Customers | & Other Prop. Pr | Current | 1-2 Years |
| Price | 75 | | Q | 60 | 80 | 70 | | 40 |
| Existing Supplier | 25 | 60 | 100 | 40 | | | | |
| Quality Conformance | QQ | | QQ | QQ | Q | | Q | Q |
| Delivery Reliability | QQ | | | Q | | | | |
| Delivery Speed | | 40 | | | | Q | | |
| Unique Product Design | Q | | | | | 30 | 100 | 60 |
| Technical Support | Q | | QQ | | | | | |
| Product Range | | | | Q | 20 | Q | | |

## Summary of Individual Responses and Consensus Results

*CASE A*

| *CASE A* ORDER-WINNING CRITERIA Summary of Responses by Function | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Criteria | OTC Sales | OTC Mkt. | Prod'n | Mat'ls Mgm't | Op'ns | Quality | Cost Acct'g | RANGE |
| **O.T.C. PRODUCTS** | | | | | | | | |
| Unique/Value-added Features/Services | 20 | 40 | 20 | 15 | 30 | 35 | 50 | 35 |
| Delivery Reliability | 20 | 30 | 20 | 30 | 20 | 20 | 25 | 10 |
| Preferred Supplier/Corp. Reputation | 10 | 10 | 20 | 30 | 40 | 20 | 0 | 40 |
| Product-Range | 5 | 15 | 20 | 15 | 10 | 0 | 25 | 25 |
| Package Leadership | 5 | 5 | 5 | 5 | 0 | 10 | 0 | 10 |
| Delivery Speed | 10 | 0 | 0 | 5 | 0 | 15 | 0 | 15 |
| Lead-time to Market | 10 | 0 | 10 | 0 | 0 | 0 | 0 | 10 |
| Price | 20 | 0 | 5 | 0 | 0 | 0 | 0 | 20 |
| | | | | | | | | |
| | | Rx Mkt/Sales | Prod'n | Mat'ls Mgm't | Op'ns | Quality | Cost Acct'g | RANGE |
| **PRESCRIPTION PRODUCTS** | | | | | | | | |
| Price | | 65 | 35 | 5 | 25 | 0 | 35 | 65 |
| Unique/Value-added Features/Services | | 0 | 20 | 15 | 30 | 70 | 35 | 70 |
| Delivery Reliability | | 15 | 20 | 25 | 15 | 0 | 30 | 30 |
| Preferred Supplier/Corp. Reputation | | 15 | 15 | 25 | 0 | 20 | 0 | 20 |
| Package Leadership | | 5 | 10 | 10 | 10 | 0 | 0 | 10 |
| Product-Range | | 0 | 0 | 10 | 10 | 10 | 0 | 10 |
| Delivery Speed | | 0 | 0 | 10 | 10 | 0 | 0 | 10 |
| Lead-time to Market | | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | | | |

**Table-4.3 Summary of Individual Functions' Views on Order-Winners for Case A.**
(* In this, and other cases, quantitative data related to individual assessments have been sorted in descending order based on the mean order-winning response. The intention is not statistical, but to achieve visual tidiness for the readers.)

| Criteria | OTC Products | Rx Products |
|---|---|---|
| Unique/Value-Added Features and Services | 40 | - |
| Preferred Supplier/Corporate Reputation | 30 | 10 |
| Delivery Reliability | 20 | 10 |
| Product Range | 10 | - |
| Price | - | 80 |
| Delivery Speed | - | - |
| Lead-Time to Market | - | - |
| Package Leadership | - | - |

**Table-4.4 The Consensus View for Case A.**

*Case B*

**ORDER-WINNING/QUALIFYING CRITERIA**

**Summary of Responses by Function**

| Criteria | Mktg. | Sales | Design | Prod'n | Extr'n Mgr. | RANGE |
|---|---|---|---|---|---|---|
| **R.V. PRODUCTS** | | | | | | |
| Delivery Reliability | Q | 40 | 15 | 20 | | 40 |
| Quality Conformance | Q | 60 | 15 | 0 | | 60 |
| Existing Supplier | 75 | 0 | 0 | Q | | 75 |
| Product Functionality | 5 | 0 | 15 | 60 | | 60 |
| Price | Q | Q | 20 | 20 | | 20 |
| Technical Support | 0 | Q | 15 | Q | | 15 |
| Delivery Speed | 0 | 0 | 15 | Q | | 15 |
| Unique Product Design | 15 | 0 | 0 | 0 | | 15 |
| Product Range | 5 | 0 | 0 | Q | | 5 |
| | | | | | | |
| **CUSTOM PRODUCTS** | | | | | | |
| Quality Conformance | Q | Q | 33 | 60 | | 60 |
| Existing Supplier | 70 | 0 | Q | Q | | 70 |
| Price | Q | Q | 33 | Q | | 33 |
| Delivery Reliability | Q | 20 | 33 | 30 | | 33 |
| Product Functionality | 30 | 50 | 0 | Q | | 50 |
| Technical Support | Q | 30 | 0 | 10 | | 30 |
| Delivery Speed | 0 | 0 | 0 | Q | | 0 |
| Product Range | 0 | 0 | 0 | 0 | | 0 |
| Unique Product Design | 0 | 0 | 0 | 0 | | 0 |
| | | | | | | |
| **MUNICIPAL PRODUCTS** | | | | | | |
| Unique Product Design | 50 | 70 | 60 | 60 | | 70 |
| Price | Q | Q | 40 | 30 | | 40 |
| Quality Conformance | Q | 20 | 0 | 10 | | 20 |
| Product Range | 20 | 0 | 0 | 0 | | 20 |
| Delivery Speed | 15 | 0 | 0 | Q | | 15 |
| Delivery Reliability | Q | 10 | 0 | Q | | 10 |
| Product Functionality | 15 | 0 | 0 | 0 | | 15 |
| Technical Support | 0 | 0 | 0 | Q | | 0 |
| Existing Supplier | Q | 0 | 0 | 0 | | 0 |
| | | | | | | |

| HOME & GARDEN PRODUCTS | | | | | | |
|---|---|---|---|---|---|---|
| Price | Q | 50 | 50 | 60 | 50 | 60 |
| Delivery Speed | Q | 30 | 30 | Q | Q | 30 |
| Existing Supplier | 50 | 0 | 0 | 0 | 50 | 50 |
| Product Range | 20 | 20 | 20 | Q | Q | 20 |
| Delivery Reliability | Q | 0 | 0 | 40 | 0 | 40 |
| Product Functionality | 20 | 0 | 0 | Q | Q | 20 |
| Unique Product Design | 10 | Q | 0 | Q | 0 | 10 |
| Quality Conformance | Q | 0 | 0 | Q | Q | 0 |
| Technical Support | 0 | 0 | 0 | 0 | 0 | 0 |
| | | | | | | |

**Table-4.5 Summary of Individual Functions' Views on Qualifiers and Order-Winners for Case B.**

| Criteria | RV PRODUCTS | | CUSTOM PROD. | HOME & GARDEN PR. | | | MUNICIPAL PRODUCTS | |
|---|---|---|---|---|---|---|---|---|
| | | | | Garden Hose | | Lawn&Garden & Other Prop. Products | | |
| | OEMs | After-market | Bombardier/ Camco | Existing Cust's | New Customers | | Current | 1-2 Yrs. |
| Price | 75 | | Q | 60 | 80 | 70 | | 40 |
| Existing Supplier | 25 | 60 | 100 | 40 | | | | |
| Quality Conformance | QQ[1] | | QQ | QQ | Q | | Q | Q |
| Delivery Reliability | QQ | | | Q | | | | |
| Delivery Speed | | 40 | | | | Q | | |
| Unique Product Design | Q | | | | | 30 | 100 | 60 |
| Technical Support | Q | | QQ | | | | | |
| Product Range | | | | Q | 20 | Q | | |

**Table-4.6 The Consensus View for Case B.**

[1] "QQ" denotes an order-losing-sensitive qualifier—the type of qualifier that may result in lost orders if the firm cannot meet the required levels. (Hill, 1994)

*CASE C*

*Case C*
**ORDER-WINNING/QUALIFYING CRITERIA**
**Summary of Responses by Function**

| Criteria | Marketing | Sales | Eng. | Production | Comptr. | RANGE |
|---|---|---|---|---|---|---|
| **NORLAB** | | | | | | |
| Price | 30 | 0 | 100 | 60 | 30 | **100** |
| Existing Supplier | 0 | 100 | 0 | 10 | Q | **100** |
| Delivery Reliability | 20 | Q | Q | 20 | 10 | **20** |
| Unique Design Capability | 15 | 0 | Q | 10 | 30 | **30** |
| Delivery Speed | 15 | Q | 0 | 0 | 30 | **30** |
| Volume Flexibility | 10 | 0 | 0 | 0 | Q | **10** |
| Prod. Dev't Cycle Time | 10 | 0 | 0 | 0 | 0 | **10** |
| Quality Conformance | Q | Q | Q | Q | Q | **0** |
| Technical Support | 0 | 0 | 0 | 0 | 0 | **0** |
| | | | | | | |
| **OTHER MAJOR OEMs** | | | | | | |
| Delivery Reliability | 20 | 70 | Q | 30 | 30 | **70** |
| Price | 40 | Q | 33 | 40 | 30 | **40** |
| Quality Conformance | Q | 30 | 33 | Q | Q | **33** |
| Unique Design Capability | 15 | 0 | Q | 30 | 20 | **30** |
| Delivery Speed | 15 | 0 | 33 | 0 | 10 | **33** |
| Technical Support | 0 | 0 | 0 | Q | 10 | **10** |
| Volume Flexibility | 5 | 0 | 0 | 0 | Q | **5** |
| Prod. Dev't Cycle Time | 5 | 0 | 0 | 0 | 0 | **5** |
| Existing Supplier | 0 | 0 | 0 | 0 | 0 | **0** |
| | | | | | | |
| **MINOR OEMs** | | | | | | |
| Delivery Speed | 15 | 50 | 100 | 100 | 50 | **100** |
| Delivery Reliability | 25 | 50 | Q | Q | 20 | **50** |
| Price | 35 | 0 | 0 | 0 | 10 | **35** |
| Unique Design Capability | 15 | 0 | 0 | Q | 20 | **20** |
| Volume Flexibility | 10 | 0 | 0 | 0 | Q | **10** |
| Quality Conformance | Q | 0 | Q | 0 | Q | **0** |
| Technical Support | 0 | 0 | 0 | 0 | 0 | **0** |
| Existing Supplier | 0 | 0 | 0 | 0 | 0 | **0** |
| Prod. Dev't Cycle Time | 0 | 0 | 0 | 0 | 0 | **0** |
| | | | | | | |

| MOTT PROPRIETARY PRODUCTS | | | | | | |
|---|---|---|---|---|---|---|
| Price | 15 | **Q** | 50 | 80 | 40 | **80** |
| Delivery Reliability | 25 | 25 | **Q** | **Q** | 30 | **30** |
| Unique Design Capability | 25 | 25 | **Q** | 20 | 20 | **25** |
| Quality Conformance | **Q** | 0 | 50 | 0 | **Q** | **50** |
| Delivery Speed | 20 | 25 | 0 | 0 | 10 | **25** |
| Technical Support | 0 | 25 | 0 | 0 | 0 | **25** |
| Prod. Dev't Cycle Time | 10 | 0 | 0 | 0 | 0 | **10** |
| Volume Flexibility | 5 | 0 | 0 | 0 | **Q** | **5** |
| Existing Supplier | 0 | 0 | 0 | 0 | 0 | **0** |
| | | | | | | |

**Table-4.7 Summary of Individual Functions' Views on Qualifiers and Order-Winners for Case C.**

| Criteria | Canadian Lab Furniture Mkt. (Norlab) | U.S. Lab Furniture Market | Other Cabinetry & Workstations | |
|---|---|---|---|---|
| | | | Imperial & Arbell | Hussman |
| Price | Q | Q | Q | - |
| Design Capability | Q | Q | Q | - |
| Design Quality | Q | Q | Q | - |
| Delivery Speed/Reliability | Q | Q | Q | 100 |
| Dealer/Reseller Skills | 100 | 100 | 100 | - |

**Table-4.8 The Consensus View for Case C.**

*CASE D*

| *Case D*<br>HEALTH CARE PRODUCTS, MARKET SUB-SEGMENTS<br>(Order-winners and Qualifiers) | | | | | | |
|---|---|---|---|---|---|---|
| Criteria | Mkt./Sales | Gen. Mgr. | Production | Logistics | Comptr. | RANGE |
| PHARMA-HOSPITAL | | | | | | |
| Price | 100 | 90 | 50 | 100 | 100 | 50 |
| Delivery Reliability | Q | 0 | 50 | QQ | Q | 50 |
| Product Range | 0 | 10 | Q | Q | 0 | 10 |
| Delivery Speed | Q | 0 | 0 | Q | 0 | 0 |
| Quality/Reg. Conformance | Q | Q | Q | QQ | Q | 0 |
| Technical Support | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Supplier | 0 | 0 | 0 | 0 | Q | 0 |
| | | | | | | |
| PHARMA-RETAIL | | | | | | |
| Price | Q | 90 | 50 | 100 | 100 | 50 |
| Delivery Reliability | 0 | 0 | 50 | QQ | Q | 50 |
| Product Range | 0 | 10 | Q | Q | 0 | 10 |
| Delivery Speed | Q | 0 | 0 | Q | 0 | 0 |
| Quality/Reg. Conformance | Q | Q | Q | QQ | Q | 0 |
| Technical Support | 0 | 0 | 0 | 0 | 0 | 0 |
| Existing Supplier | 0 | 0 | 0 | 0 | Q | 0 |
| | | | | | | |
| HAEMODIALYSIS | | | | | | |
| Price | 75 | 80 | 50 | 100 | 100 | 50 |
| Delivery Reliability | QQ | QQ | 50 | QQ | Q | 50 |
| Product Range | Q | 20 | Q | Q | 0 | 20 |
| Existing Supplier | 25 | 0 | 0 | 0 | Q | 25 |
| Delivery Speed | QQ | QQ | 0 | Q | 0 | 0 |
| Quality/Reg. Conformance | Q | Q | Q | QQ | Q | 0 |
| Technical Support | Q | 0 | 0 | 0 | 0 | 0 |
| | | | | | | |

**Table-4.9a Summary of Individual Functions' Views on Qualifiers and Order-Winners for Case D (Health Care Market).**

*Case D*

**LABORATORY CHEMICALS. MARKET SUB-SEGMENTS**

**(Order-winners and Qualifiers)**

| Criteria | Marketing | Production | Comptroller | RANGE |
|---|---|---|---|---|
| DRY REAGENTS | | | | |
| Price | 70 | 70 | 100 | 30 |
| Quality/Reg. Conformance | Q | 30 | 0 | 30 |
| Delivery Speed | 30 | 0 | 0 | 30 |
| Delivery Reliability | Q | Q | Q | 0 |
| Technical Support | 0 | Q | Q | 0 |
| Existing Supplier | Q | 0 | 0 | 0 |
| Product Range | 0 | Q | 0 | 0 |
| Ability to Customize | 0 | 0 | 0 | 0 |
| Volume Flexibility | 0 | 0 | 0 | 0 |
| | | | | |
| STOCK CHEMICALS | | | | |
| Price | 20 | 70 | 100 | 80 |
| Existing Supplier | 60 | 0 | 0 | 60 |
| Quality/Reg. Conformance | Q | 30 | 0 | 30 |
| Delivery Speed | 20 | 0 | 0 | 20 |
| Delivery Reliability | Q | Q | Q | 0 |
| Technical Support | 0 | Q | Q | 0 |
| Product Range | Q | Q | 0 | 0 |
| Ability to Customize | 0 | 0 | 0 | 0 |
| Volume Flexibility | 0 | 0 | 0 | 0 |
| | | | | |
| CUSTOM SOLUTIONS | | | | |
| Quality/Reg. Conformance | Q | 50 | Q | 50 |
| Ability to Customize | 0 | 0 | 100 | 100 |
| Volume Flexibility | 40 | 50 | 0 | 50 |
| Product Range | 40 | 0 | 0 | 40 |
| Technical Support | 10 | Q | Q | 10 |
| Existing Supplier | 10 | 0 | 0 | 10 |
| Price | 0 | Q | Q | 0 |
| Delivery Speed | 0 | Q | 0 | 0 |
| Delivery Reliability | Q | 0 | 0 | 0 |
| | | | | |

**Table-4.9b Summary of Individual Functions' Views on Qualifiers and Order-Winners for Case D (Lab. Chemicals Market Segmentation-1).**

*Case D*

**LABORATORY CHEMICALS, MARKET SUB-SEGMENTS**

**(Order-winners and Qualifiers)**

| Criteria | Sales | Gen. Mgr. | Logistics | RANGE |
|---|---|---|---|---|
| INDUSTRIAL CUSTOMERS (TODAY) | | | | |
| Price | 50 | 40 | 30 | 20 |
| Quality/Reg. Conformance | Q | Q | 40 | 40 |
| Delivery Speed | 30 | 10 | Q | 30 |
| Delivery Reliability | QQ | 10 | 30 | 30 |
| Existing Supplier | 20 | 10 | 0 | 20 |
| Product Range | Q | 10 | Q | 10 |
| Technical Support | 0 | 10 | Q | 10 |
| Product Development | 0 | 10 | Q | 10 |
| | | | | |
| INDUSTRIAL CUSTOMERS (+2 YEARS) | | | | |
| Quality/Reg. Conformance | Q | Q | 40 | 40 |
| Price | 33 | 40 | 30 | 10 |
| Delivery Speed | 33 | 10 | Q | 33 |
| Product Range | 33 | 10 | Q | 33 |
| Delivery Reliability | QQ | 10 | 30 | 30 |
| Technical Support | Q | 10 | Q | 10 |
| Existing Supplier | 0 | 10 | 0 | 10 |
| Product Development | 0 | 0 | Q | 0 |
| | | | | |
| CLINICAL CUSTOMERS FOR STAINING SOLUTIONS | | | | |
| Price | 35 | 70 | 100 | 65 |
| Quality/Reg. Conformance | 65 | Q | Q | 65 |
| Technical Support | Q | 10 | Q | 10 |
| Product Range | Q | 10 | Q | 10 |
| Delivery Reliability | Q | 5 | Q | 5 |
| Delivery Speed | 0 | 5 | Q | 5 |
| Existing Supplier | 0 | 0 | 0 | 0 |
| Product Development | 0 | 0 | 0 | 0 |
| | | | | |

| CLINICAL CUSTOMERS FOR OTHER PRODUCTS | | | | |
|---|---|---|---|---|
| Price | 90 | 70 | 100 | 30 |
| Delivery Speed | Q | 5 | Q | 5 |
| Delivery Reliability | Q | 5 | Q | 5 |
| Technical Support | 0 | 10 | Q | 10 |
| Product Range | 0 | 10 | Q | 10 |
| Existing Supplier | 10 | 0 | 0 | 10 |
| Quality/Reg. Conformance | 0 | Q | Q | 0 |
| Product Development | 0 | 0 | 0 | 0 |
| | | | | |
| EDUCATIONAL CUSTOMERS | | | | |
| Price | 90 | 70 | 100 | 30 |
| Product Range | 10 | 10 | Q | 10 |
| Technical Support | 0 | 10 | Q | 10 |
| Delivery Speed | 0 | 5 | Q | 5 |
| Delivery Reliability | 0 | 5 | Q | 5 |
| Quality/Reg. Conformance | Q | Q | Q | 0 |
| Existing Supplier | Q | 0 | 0 | 0 |
| Product Development | 0 | 0 | 0 | 0 |

**Table-4.9c Summary of Individual Functions' Views on Qualifiers and Order-Winners for Case D (Lab. Chemicals Market Segmentation-2).**

| Criteria | HEALTH CARE PRODUCTS | | LABORATORY CHEMICALS | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Custom Solutions | | | | | |
| | Pharma Products | Haemo-dialysis | Existing | New Customers | Salts | Acids & Solvents | High-Purity Solvents | Specialty Chemicals |
| Price | 100 | 100 | | 30 | 70 | 90 | 90 | 33 |
| Delivery Speed | | Q | QQ | QQ | | | | |
| Delivery Reliability | Q | QQ | Q | Q | Q | Q | QQ | Q |
| Consistent Quality | | | | | | | QQ | Q |
| Existing Supplier | | | | | 10 | 5 | 5 | |
| Product Range | | | | | Q | | Q | Q |
| Brand Name | | | | | 20 | 5 | 5 | 33 |
| Technical Support | | | | | | | | 33 |
| Ability to Customize | | | Q | Q | | | | |
| VWR Rep. Skills | | | 100 | 70 | | | | |

**Table-4.10 The Consensus View for Case D.**

*CASE E*

*Case E*
**QUALIFYING/ORDER-WINNING CRITERIA**
**Summary of Responses by Function**

| Criteria | Prod. Dir. | Group Prod. Dir. | Sales Promo. | Oper'ns Bus. Mgr. | Plant Mgr. | Nat'l Plann'g Dir. | RANGE |
|---|---|---|---|---|---|---|---|
| **ADULT TYLENOL** | | | | | | | |
| Brand Image | 80 | 45 | 40 | 30 | 40 | 30 | 50 |
| Product Innovation | 10 | 40 | 25 | 20 | 20 | 20 | 30 |
| Trade Relations | Q | 0 | 0 | 15 | 20 | 15 | 20 |
| New Product Time-to-Market | 0 | 10 | 10 | 20 | 0 | 10 | 20 |
| Value-added Features/Services | 5 | 5 | 10 | 5 | 20 | 0 | 20 |
| Broad Product-Range | 5 | 0 | 5 | 10 | 0 | 15 | 10 |
| Professional Endorsement | 0 | 0 | 0 | 0 | 0 | 10 | 10 |
| Responsiveness to Promotions | 0 | 0 | 10 | 0 | 0 | 0 | 10 |
| Delivery - Reliability | Q | Q | Q | Q | Q | Q | 0 |
| Delivery - Speed | QQ | Q | Q | Q | 0 | 0 | 0 |
| Package Leadership | Q | 0 | Q | 0 | 0 | 0 | 0 |
| Price | Q | Q | Q | Q | Q | Q | 0 |
| Product Performance | Q | 0 | Q | 0 | Q | Q | 0 |
| Quality Conformance | Q | Q | Q | Q | Q | Q | 0 |
| **CHILDREN'S TYLENOL** | | | | | | | |
| Brand Image | 30 | 50 | 40 | 50 | 40 | 25 | 25 |
| Product Innovation | 20 | 20 | 25 | 15 | 20 | 25 | 10 |
| New Product Time-to-Market | 10 | 20 | 10 | 10 | 0 | 15 | 20 |
| Price | 10 | Q | Q | Q | Q | Q | 10 |
| Value-added Features/Services | 10 | 10 | 10 | 5 | 20 | 0 | 20 |
| Product Performance | Q | 0 | Q | 20 | Q | 0 | 20 |
| Broad Product-Range | 20 | 0 | 5 | Q | 0 | Q | 20 |
| Trade Relations | Q | 0 | 0 | 0 | 20 | 10 | 20 |
| Professional Endorsement | 0 | 0 | 0 | 0 | 0 | 25 | 25 |
| Responsiveness to Promotions | 0 | 0 | 10 | 0 | 0 | 0 | 10 |
| Delivery - Reliability | Q | Q | Q | Q | Q | Q | 0 |
| Delivery - Speed | 0 | 0 | Q | Q | 0 | 0 | 0 |
| Package Leadership | Q | Q | Q | 0 | 0 | Q | 0 |
| Quality Conformance | Q | QQ | Q | Q | Q | Q | 0 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **TYLENOL COLD & FLU** | | | | | | | |
| Brand Image/Positioning | 25 | 25 | 25 | Q | 40 | 30 | 40 |
| Product Innovation | 20 | 25 | 40 | 40 | 20 | 20 | 20 |
| Delivery - Reliability | QQ | Q | Q | 15 | Q | Q | 15 |
| Price | Q | 15 | Q | 15 | Q | Q | 15 |
| Value-added Features/Services | 15 | 15 | 10 | 10 | 20 | 0 | 20 |
| Product Performance | 20 | 0 | Q | Q | Q | Q | 20 |
| Trade Relations | 15 | 0 | 0 | 0 | 20 | 15 | 20 |
| New Product Time-to-Market | 0 | QQ | 10 | 20 | 0 | 10 | 20 |
| Broad Product-Range | 5 | Q | 5 | 0 | 0 | 15 | 15 |
| Responsiveness to promotions | 0 | 10 | 10 | 0 | 0 | 0 | 10 |
| Package Leadership | 0 | 10 | Q | 0 | 0 | 0 | 10 |
| Professional Endorsement | 0 | 0 | 0 | 0 | 0 | 10 | 10 |
| Delivery – Speed | Q | Q | Q | 0 | 0 | 0 | 0 |
| Quality Conformance | Q | Q | Q | Q | Q | Q | 0 |
| **IMODIUM** | | | | | | | |
| Brand Image | 30 | 25 | 40 | 10 | 40 | 50 | 40 |
| Product Innovation | 60 | 20 | 25 | 25 | 20 | 0 | 60 |
| Price | Q | 20 | Q | Q | Q | 10 | 20 |
| Product Performance | Q | 0 | Q | 30 | Q | 0 | 30 |
| Trade Relations | 10 | 0 | 0 | 0 | 20 | 25 | 25 |
| Value-added Features/Services | Q | 10 | 10 | 5 | 20 | 0 | 20 |
| Broad Product-Range | Q | 0 | 5 | 20 | 0 | 15 | 20 |
| New Product Time-to-Market | Q | 15 | 10 | 10 | 0 | 0 | 15 |
| Responsiveness to promotions | 0 | 10 | 10 | 0 | 0 | 0 | 10 |
| Delivery – Reliability | Q | Q | Q | Q | Q | Q | 0 |
| Delivery – Speed | Q | Q | Q | Q | 0 | 0 | 0 |
| Package Leadership | QQ | 0 | Q | 0 | 0 | Q | 0 |
| Quality Conformance | Q | Q | Q | Q | Q | Q | 0 |
| **CHILDREN'S TYLENOL COLD** | | | | | | | |
| Brand Image | Q | 50 | 25 | 30 | 40 | 25 | 50 |
| Product Innovation | 40 | 20 | 40 | 30 | 20 | 25 | 20 |
| New Product Time-to-Market | 20 | 20 | 10 | 20 | 0 | 15 | 20 |
| Value-added Features/Services | 10 | 10 | 10 | 0 | 20 | 0 | 20 |
| Product Performance | 30 | 0 | Q | 0 | Q | 0 | 30 |
| Trade Relations | Q | 0 | 0 | 10 | 20 | 10 | 20 |
| Professional Endorsement | 0 | 0 | 0 | 0 | 0 | 25 | 25 |
| Broad Product-Range | 0 | 0 | 5 | 10 | 0 | Q | 10 |
| Responsiveness to Promotions | 0 | 0 | 10 | 0 | 0 | 0 | 10 |
| Price | Q | Q | Q | Q | Q | Q | 0 |
| Delivery – Speed | 0 | 0 | Q | Q | 0 | 0 | 0 |
| Delivery - Reliability | Q | Q | Q | Q | Q | Q | 0 |
| Quality Conformance | Q | QQ | Q | Q | Q | Q | 0 |
| Package Leadership | 0 | Q | Q | 0 | 0 | Q | 0 |

**Table-4.11a Summary of Individual Functions' Views on Qualifiers and Order-Winners for Case E (products 1 through 5).**

*Case E*

**QUALIFYING/ORDER-WINNING CRITERIA**

**Summary of Responses by Function**

| Criteria | Prod. Dir. | Group Prod. Dir. | Sales Promo. | Oper'ns Bus. Mgr. | Plant Mgr. | Nat'l Plann'g Dir. | RANGE |
|---|---|---|---|---|---|---|---|
| **TYLENOL PM** | | | | | | | |
| Brand Image | 15 | 45 | 40 | 70 | 40 | 30 | **55** |
| Product Innovation | 15 | 40 | 25 | 10 | 20 | 20 | **30** |
| Trade Relations | Q | 0 | 0 | 10 | 20 | 15 | **20** |
| Value-added Features/Services | 5 | 5 | 10 | 10 | 20 | 0 | **20** |
| Consumer Preference | 50 | 0 | 0 | 0 | 0 | 0 | **50** |
| New Product Time-to-Market | 0 | 10 | 10 | 0 | 0 | 10 | **10** |
| Product Performance | 15 | 0 | Q | 0 | Q | Q | **15** |
| Broad Product-Range | 0 | 0 | 5 | 0 | 0 | 15 | **15** |
| Professional Endorsement | 0 | 0 | 0 | 0 | 0 | 10 | **10** |
| Responsiveness to Promotions | 0 | 0 | 10 | 0 | 0 | 0 | **10** |
| Price | Q | Q | Q | Q | Q | Q | **0** |
| Delivery – Speed | 0 | Q | Q | Q | 0 | 0 | **0** |
| Delivery – Reliability | Q | Q | Q | Q | Q | Q | **0** |
| Quality Conformance | QQ | Q | Q | Q | Q | Q | **0** |
| Package Leadership | 0 | 0 | Q | 0 | 0 | 0 | **0** |
| **CHILDREN'S MOTRIN** | | | | | | | |
| Delivery - Reliability | Q | Q | Q | 30 | Q | Q | **30** |
| Brand Image | 5 | 25 | 30 | Q | 40 | 15 | **35** |
| Product Innovation | 30 | 25 | 25 | 10 | 20 | 25 | **20** |
| Product Performance | 40 | 0 | Q | Q | Q | 25 | **40** |
| New Product Time-to-Market | 25 | 20 | 25 | 0 | 0 | 15 | **25** |
| Price | 0 | 10 | Q | 30 | Q | Q | **30** |
| Value-added Features/Services | Q | 10 | 5 | 30 | 20 | 0 | **30** |
| Trade Relations | 0 | 0 | 0 | 0 | 20 | 10 | **20** |
| Responsiveness to promos, etc. | 0 | 10 | 10 | 0 | 0 | 0 | **10** |
| Broad Product-Range | 0 | 0 | 5 | 0 | 0 | 10 | **10** |
| Delivery - Speed | Q | Q | Q | 0 | 0 | 0 | **0** |
| Quality Conformance | Q | Q | Q | Q | Q | Q | **0** |
| Package Leadership | 0 | 0 | Q | 0 | 0 | Q | **0** |
| Professional Endorsement | 0 | | 0 | 0 | 0 | Q | **0** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **TYLENOL SINUS** | | | | | | | |
| Product Innovation | 30 | 25 | 40 | 40 | 20 | 20 | 20 |
| Brand Image | 20 | 25 | 25 | Q | 40 | 30 | 40 |
| Delivery - Reliability | Q | Q | Q | 15 | Q | Q | 15 |
| New Product Time-to-Market | 20 | QQ | 10 | 20 | 0 | 10 | 20 |
| Value-added Features/Services | 15 | 15 | 10 | 10 | 20 | 0 | 20 |
| Price | 0 | 15 | Q | 15 | Q | Q | 15 |
| Trade Relations | Q | 0 | 0 | 0 | 20 | 15 | 20 |
| Broad Product-Range | 5 | Q | 5 | 0 | 0 | 15 | 15 |
| Ability to Respond to Promotions | 10 | 10 | 10 | 0 | 0 | 0 | 10 |
| Package Leadership | QQ | 10 | Q | 0 | 0 | 0 | 10 |
| Professional Endorsement | 0 | 0 | 0 | 0 | 0 | 10 | 10 |
| Delivery – Speed | Q | Q | Q | 0 | 0 | 0 | 0 |
| Quality Conformance | Q | Q | Q | Q | Q | Q | 0 |
| Product Performance | QQ | 0 | Q | Q | Q | Q | 0 |
| **TYLENOL ALLERGY/SINUS** | | | | | | | |
| Product Innovation | 40 | 25 | 40 | 40 | 20 | 20 | 20 |
| Brand Image | 15 | 25 | 25 | Q | 40 | 30 | 40 |
| Delivery - Reliability | Q | Q | Q | 15 | Q | Q | 15 |
| New Product Time-to-Market | 20 | QQ | 10 | 20 | 0 | 10 | 20 |
| Value-added Features/Services | 15 | 15 | 10 | 10 | 20 | 0 | 20 |
| Price | 0 | 15 | Q | 15 | Q | Q | 15 |
| Trade Relations | Q | 0 | 0 | 0 | 20 | 15 | 20 |
| Broad Product-Range | 5 | Q | 5 | 0 | 0 | 15 | 15 |
| Ability to Respond to Promotions | 5 | 10 | 10 | 0 | 0 | 0 | 10 |
| Package Leadership | QQ | 10 | Q | 0 | 0 | 0 | 10 |
| Professional Endorsement | 0 | 0 | 0 | 0 | 0 | 10 | 10 |
| Delivery - Speed | Q | Q | Q | 0 | 0 | 0 | 0 |
| Quality Conformance | Q | Q | Q | Q | Q | Q | 0 |
| Product Performance | 0 | 0 | Q | Q | Q | Q | 0 |
| **LACTAID** | | | | | | | |
| Brand Image | 0 | 25 | 40 | Q | 40 | 15 | 40 |
| Product Performance | 40 | 0 | Q | Q | Q | 25 | 40 |
| Product Innovation | 10 | 20 | 25 | 0 | 20 | 25 | 25 |
| Price | 10 | 20 | Q | Q | Q | Q | 20 |
| Communication of Prod. Benefits | 30 | 0 | 0 | 60 | 0 | 0 | 60 |
| Value-added Features/Services | 10 | 15 | 10 | 20 | 20 | 0 | 20 |
| Package Leadership | 0 | 10 | Q | 20 | 0 | Q | 20 |
| New Product Time-to-Market | 0 | Q | 10 | Q | 0 | 15 | 15 |
| Trade Relations | Q | 0 | 0 | 0 | 20 | 10 | 20 |
| Responsiveness to promos, etc. | 0 | 10 | 10 | 0 | 0 | 0 | 10 |
| Broad Product-Range | 0 | 0 | 5 | 0 | 0 | 10 | 10 |
| Delivery - Speed | 0 | Q | Q | 0 | 0 | 0 | 0 |
| Delivery - Reliability | Q | Q | Q | Q | Q | Q | 0 |
| Quality Conformance | 0 | Q | Q | Q | Q | Q | 0 |
| Professional Endorsement | 0 | 0 | 0 | 0 | 0 | Q | 0 |

**Table-4.11b Summary of Individual Functions' Views on Qualifiers and Order-Winners for Case E (products 6 through 10).**

| Criteria | MASS, FOOD, & DRUG CHAINS (67%)[2] | WHOLESALERS (22%) | WAREHOUSE CLUBS (6%) | OTHERS (5%) |
|---|---|---|---|---|
| Price | Q | Q | Q | 20 |
| Delivery Speed | Q | QQ | Q | - |
| On-time Delivery | Q | QQ | Q | - |
| Quality Conformance | Q | Q | Q | - |
| Product Innovation/New Products | 30 | 60 | 20 | - |
| Broad Product Range | Q | Q | - | - |
| Time to Market with New Products | - | - | - | - |
| Package Superiority | Q | Q | - | - |
| Trade Relations, Services, and Partnering | 30 | 25 | 10 | - |
| Brand Name | Q | Q | Q | Q |
| Ability to Customize Promotions and End-Products | 30 | 10 | 35 | 80 |
| Ability to Customize Trade Case Configurations | 10 | 5 | 35 | - |

**Table-4.11c Summary of the National Sales Account Director's Views on Qualifiers and Order-Winners for Case E.**

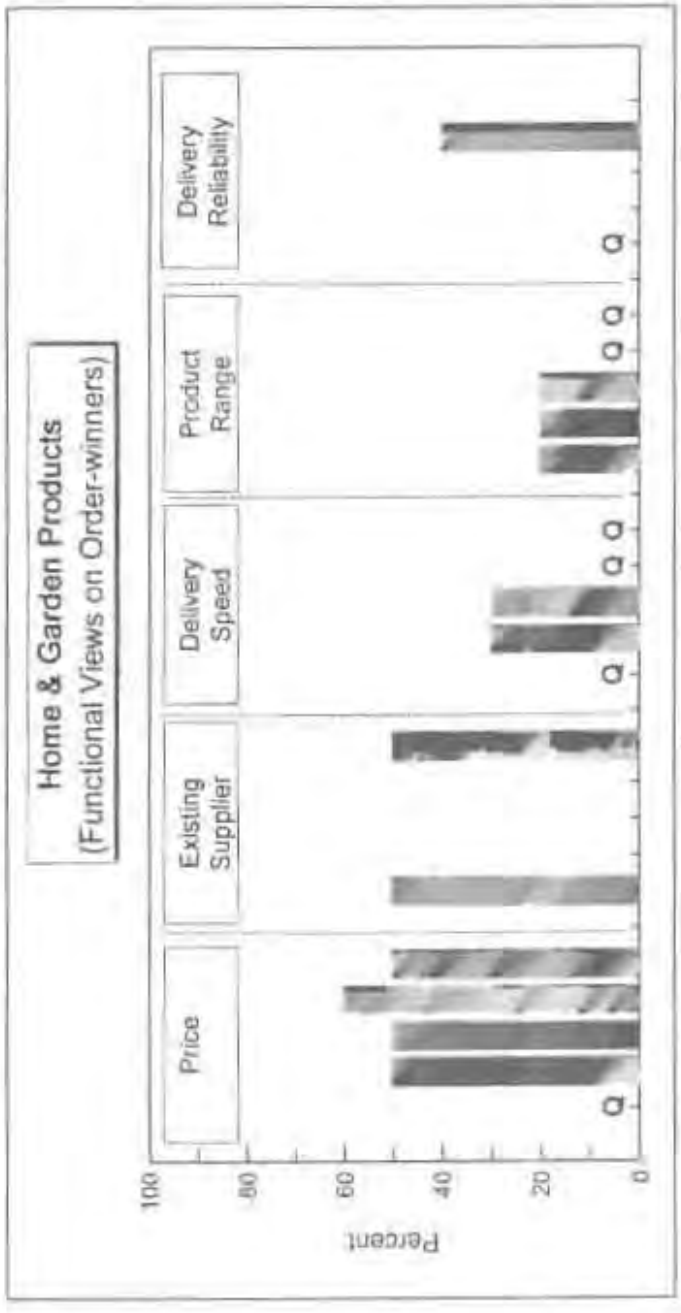
[2] The percentages in brackets indicate the portion of sales generated by the respective customer.

| Criteria | Group-I | | Group-II | | Group-III | | Group-IV | |
|---|---|---|---|---|---|---|---|---|
| | A/C/S & CTC[1] | | Adult | Tylenol | | | Children's | Children's |
| | Current | New Prod. | Tylenol | PM | Imodium | Lactaid | Tylenol | Motrin |
| Price | Q | Q | **Q** | **Q** | QQ | Q | Q | Q |
| Delivery Speed | Q | Q | Q | Q | Q | Q | Q | Q |
| On-time Delivery | QQ | QQ | Q | Q | Q | Q | QQ | QQ |
| Quality Conformance | Q | Q | QQ | QQ | Q | Q | QQ | QQ |
| Product Innovation/ New Products | 30 | 40 | 30 | 30 | 40 | **30** | 25 | 30 |
| Broad Product Range | - | - | 5 | - | - | - | 10 | 15 |
| Time to Market with New Products | 10 | 20 | **Q** | **Q** | Q | Q | 20 | 20 |
| Package Superiority | QQ | QQ | - | - | Q | Q | Q | Q |
| Trade Services/ Ability To Customize | 30 | 20 | **30** | **20** | 30 | **10** | 15 | 15 |
| Brand Name | 30 | 20 | *35* | *50* | 30 | 20 | 30 | 20 |
| Communication of Product Benefits | - | - | - | - | - | *40* | - | - |

**Table-4.12 The Consensus View for Case E.**
**(Bold indicates increasing importance in two-to-three years; italics signify decreasing importance)**

[1] The acronyms refer to a group of like-products: Allergy/Cold/Sinus, and Children's Tylenol Cold.

**APPENDIX-IIB: Example of a graphical representation of functional views, used in group meetings (with participant names or titles excluded to preserve anonymity)**



**APPENDIX-IIC: Example of a tabular representation of functional views, used in group meetings (with participant names or titles excluded to preserve anonymity**

BDH Inc.

**HEALTH CARE PRODUCTS, MARKET SUB-SEGMENTS**

**(Order-winners and Qualifiers)**

| | Pharma-Hospital | | | | | Pharma-Retail | | | | | Haemodialysis | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | M/S | GM | PRD | LGS | CMP | M/S | GM | PRD | LGS | CMP | M/S | GM | PRD | LGS | CMP |
| **Price** | 100 | 90 | 50 | 100 | 100 | Q | 90 | 50 | 100 | 100 | 75 | 80 | 50 | 100 | 100 |
| **Delivery Speed** | Q | | | Q | | Q | | | Q | | QQ | QQ | | Q | |
| **Delivery Reliability** | Q | | 50 | QQ | Q | | | 50 | QQ | Q | QQ | QQ | 50 | QQ | Q |
| **Quality/Reg. Conf'nce** | Q | Q | Q | QQ | Q | Q | Q | Q | QQ | Q | Q | Q | Q | QQ | Q |
| **Technical Support** | | | | | | | | | | | Q | | | | |
| **Existing Supplier** | | | | | Q | | | | | Q | 25 | | | | Q |
| **Product Range** | | 10 | Q | Q | | | 10 | Q | Q | | Q | 20 | Q | Q | |

## Appendix-III

# Definitions for the Criteria in the Master List

---

**Price**
The extent to which products qualify or win orders on the basis of being the lowest-priced product in their respective market segments.

**Conformance Quality**
Ability to consistently meet the pre-established quality specifications.

**Delivery Speed**
Delivering (on an on-going basis) at lead times shorter than competitors.

**Delivery Reliability**
Competing on the basis of on-time and complete deliveries, provided that the delivery speed is within market averages.

**Broad Product Range**
Ability to provide a wide range of products within several categories which may enable the customers to do "one-stop shopping."

**Design Customization**
Possessing the capability to incorporate customer-specific changes to the existing basic design.

**Product Reliability**
Producing products with market-leading low failure rate.

**Product Innovation**
Competing on the basis of new and innovative products which competitors cannot duplicate in the short term.

**Product Performance**
Ability to design products with performance superior to competing products.

**After-Sales Service**
The extent to which the firm can address problems with product performance in the field.

**Broad Distribution**
Winning customers based on the wide availability of products at all major outlets.

**Brand Image**
Capitalizing on the established image and market share of the brand(s).

**Design Quality**
Ability to design product features with high perceived quality.

**Company Reputation**
Using the well-established and trusted company name to obtain and keep customers.

**New Product Time-to-Market**
The extent to which products establish themselves by being first in the market.

**Product Availability**
Ability to consistently make products available to customers at high demand periods.

**Advertising/Promotion**
Using well-targeted and far-reaching consumer advertising and trade-customer promotions to increase product exposure.

**High-Performance Design**
Designing products with performance characteristics that are superior to those of competitors.

**Existing Supplier**
Capitalizing on customers' previous and on-going relationship with the firm.

**Technical Support**
Ability to provide technical expertise to consumers; or working with the technical staff of customers.

**Product Features**
Having product features that are more plentiful and more desirable than competitors'.

**Package Design**
Competing on the basis of unique/innovative packaging, rather than the product itself.

**Environmental Leadership**
Having a high reputation as an industry-leading environmentally conscious company.

**Promotional Pricing**
Competing on the basis of deal pricing, rather than everyday-low-pricing.

**Trade Relations**
Being an existing and preferred supplier; forging partnerships with customers.

**Volume Flexibility**
Ability to vary shipment volumes according to customer requirements.

**Demand Fluctuation Flexibility**
Consistently meeting the fluctuating demand in the marketplace (seasonal variations, unforecasted demand, etc.).