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**WORKING PAPER SERIES ON
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Strategies for dealing with derived demand

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Strategies for dealing with derived demand

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Strategies for dealing with derived demand

Abstract

In this article, we present the results from an exploratory investigation of the derived demand phenomenon as it is experienced by 14 suppliers near the beginning of the supply chain. We present derived demand as an information problem, i.e. a problem concerned with both obtaining information about downstream markets and providing information to them. Our findings suggest that the appropriate way to deal with derived demand issues depends on two underlying factors: (1) the value of the product to downstream customers and (2) the firm's ability to target downstream customers. We discuss a number of approaches to deal with derived demand issues and their implications for managers.

Keywords: supply chain management, derived demand, industrial marketing, interorganizational cooperation, market orientation

INTRODUCTION

One of the most distinctive characteristics of B2B firms supplying products and services to other firms, especially those positioned near the beginning of the supply chain, is the derived demand phenomenon. That is, the demand for their product is derived from the demand for the customer's product and thus, ultimately, end user demand. Our experiences with various B2B firms make it clear that the characteristic of derived demand presents them with a variety of challenging problems that all too often lack clear solutions.

Surprisingly, the literature hardly discusses the problems caused by derived demand. For instance, most B2B marketing textbooks (Anderson and Narus, 1999; Brierty et al., 1998; Dwyer and Tanner, 1999; Hayes et al., 1996; Hutt and Speh, 1992) define the concept of derived demand, explain how it complicates demand forecasting, and argue that B2B marketers should look at both their immediate customers and the downstream markets served by them. But the literature does not go beyond these general observations and fails to offer insight into the consequences of derived demand, the challenges it causes for managers and solutions to deal with them.

In this paper, we explore these neglected implications of derived demand. We first present the management literature's perspective on derived demand. Although the literature is scarce, it may offer a first glimpse of problems encountered and solutions tried. Next, we present the findings of our empirical study to further explore derived demand issues. We conclude with a number of implications for management and suggestions for future research.

THEORETICAL BACKGROUND

Derived demand is considered an important characteristic of B2B markets. For instance, Narver and Slater (1990, p. 21) argue that a company "must understand not only the cost and revenue dynamics of its immediate target buyer firms, but also the cost and revenue dynamics

facing the buyers' buyers, from whose demand the demand of the immediate market is derived". Likewise, Day and Wensley (1988, p. 1) state that "customer-focused assessments start with detailed analysis of customer benefits within end-use segments and work backwards from the customer to the company". This type of thinking, starting with the end-user and ending with the firm, is central to the supply chain concept and suggests that truly market-oriented firms have a thorough knowledge of the entire value chain. But the coordination of three or more supply chain levels complicates the design and implementation of marketing programs considerably (Flint, 2004). In the following sections, we borrow from various management disciplines, such as economics, supply chain management and marketing, for some initial insights into the derived demand phenomenon.

The bullwhip effect

Various disciplines investigated the bullwhip effect (e.g. Clark, 1917; Mitchell, 1924; Forrester, 1958; Taylor, 2000), referring to the phenomenon that "orders to the supplier tend to have larger variance than sales to the buyer (i.e., demand distortion), and the distortion propagates upstream in an amplified form (i.e., variance amplification)" (Lee et al., 1997, p. 546). The volatility of derived demand complicates demand forecasting and causes many managerial problems (Bishop et al., 1984; Rosenberg, 1982). Forrester (1958) attributed the phenomenon to the tendency of decision makers to overreact to changes in demand, while Burbidge (1961) pointed to the contribution of stock control procedures based on EOQ logic.

Using a supply chain perspective, Taylor (2000) describes how in the UK automotive component supply chain, demand amplification is caused by demand variability, supply variability, functional silos, decision making rationale, stock minimisation policies, JIT expectations, and pricing policies. Several authors suggest that recent technologies such as enterprise resource planning and internet may help buyers and sellers to coordinate their

activities and thus reduce demand amplification (e.g. García-Dastugue and Lambert, 2003, Gardiner et al., 2002). Others disagree and note that modern computer systems designed to control supply chain activities can be inherently unstable and thus exacerbate demand amplification (Wilding, 1998).

Cooperation and networks

Firms may deal with the consequences of derived demand by cooperating with other firms in the supply chain. Cooperation within the supply chain is especially propagated in the supply chain management (SCM) literature. Indeed, SCM is based on the notion of understanding and managing the entire supply chain (Cooper et al., 1997). It maintains that each firm in the supply chain affects the performance of all other supply chain members and thus the performance of the supply chain as a whole (Mentzer et al., 2001). As a consequence, the SCM literature emphasizes the need for cooperation and coordination among member firms (Skjoett-Larsen et al., 2003). Nevertheless, empirical SCM studies typically take a dyadic approach, focusing on buyer-seller cooperation and coordination in the context of a supply chain and ignoring issues that concern the whole supply chain. For instance, in their content analysis of 35 years of *The Journal of Supply Chain Management*, Carter and Ellram (2003) found very few articles dealing with “issues that expand beyond the single dyad in the buyer-supplier relationship”. This gap clearly suggests the need for research into relationships that go beyond the direct buyer-seller relationship.

During the last couple of decades, several studies of buyer-seller relationships focused on networks of organizations that collaborate in creating value for end users (Ford, 1997). Activity links and activity chains link suppliers and customers at various levels in an interconnected chain of activities (Anderson et al., 1994). But, just like the empirical SCM studies, investigations of networks typically focus on either the buyer-supplier dyad or on

rather abstract characteristics of the network as a whole. Relationships with downstream partners beyond the immediate customers are largely ignored or only discussed in very abstract terms.

Push and pull strategies

The marketing literature about designing effective marketing channels and accompanying communication strategies distinguishes between push and pull strategies. A *push strategy* attempts to push products through the supply chain by using personal selling and providing reseller support like discounts, margins, sales support information and comarketing programs (Gilliland, 2004). In contrast, a *pull strategy* aims to pull products through the supply chain by stimulating end-user demand and consists of targeting end-users through mass media and personal selling (Gerstner and Hess, 1995). For instance, Paliwoda and Bonaccorsi (1993) describe how manufacturers of airplane components try to convince airlines to demand that suppliers (i.e. the aircraft manufacturers) use their components. A widely used pull strategy to stimulate demand is *ingredient branding*, i.e. branding aimed at downstream customers, as exemplified by the familiar Intel Inside campaign (Norris, 1992). As the component brand is identified on the product containing the component, firms wanting to pursue an ingredient branding strategy need to cooperate with their customers to effectuate a co-branding alliance. While there are many studies on ingredient branding, most of them concern horizontal alliances instead of vertical ones.

Derived demand issues are also touched upon in the literature on adoption and diffusion. While this literature focuses on adoption of new products by the immediate customer, some authors suggest that new products need to be adopted by the whole supply chain in order to become successful (Jones and Ritz, 1991; Mesak and Darrat, 2004).

Our inventory demonstrates that the literature on derived demand issues is scarce and fragmented. At the same time, many managers in B2B firms are in need of guidelines to design and implement marketing efforts directed at downstream customers beyond the immediate customers that are traditionally targeted. Because the literature fails to offer a systematic framework that helps managers to deal with derived demand issues, managers are forced to develop their own solutions and approaches. This gap between the literature and management practice led us to conduct an exploratory investigation of the derived demand phenomenon.

RESEARCH METHOD

As our objective was to inventory the management issues caused by derived demand, as well as the solutions that firms designed to deal with them, we used an exploratory research method. We conducted in-depth interviews with managers from firms positioned near the beginning of the supply chain (since they are most likely to experience the consequences of derived demand) to inventory the resulting management challenges and potential solutions. The firms were selected from various industries (such as fibers, food ingredients, metal and plastics) to capture a diverse set of problems and solutions. In each firm, we identified the person most knowledgeable about the firm's marketing activities and supply chains (in most cases this turned out to be a senior marketing manager). We continued adding firms to our sample until the results converged and the interviews yielded no new insight (Eisenhardt, 1989; Glaser and Strauss, 1977). We interviewed a total of 17 respondents in 14 firms.

For the interviews we used a semi-structured format, building on previous findings about the effects of derived demand found in the literature and exploring additional relevant issues. The interviews started with a set of questions about the firm, its products and markets, and the supply chain it is a part of. Next, we discussed the managerial challenges caused by

derived demand. All respondents proved to be very familiar with the concept of derived demand and acknowledged its relevance. We then asked them to indicate how derived demand affected their firm, and to elaborate on the problems caused by it. We encouraged respondents to discuss the problems in detail and illustrate them with concrete examples to improve our understanding. Next, we asked whether (and how) their firm tried to solve these problems and to indicate the extent to which these efforts were successful.

The interviews lasted an average of one and a half hour. All interviews were tape-recorded. Detailed interview reports were sent to the respondents, who checked them for mistakes or omissions and offered further explanation for ambiguous issues.

DEALING WITH DERIVED DEMAND

All respondents are well aware of the influence of downstream markets on the demand for their products. But this awareness of derived demand effects does not always lead these managers to design and implement marketing programs directed at downstream customers. Some managers seem to accept derived demand as an inherent characteristic of B2B markets and feel that it is outside their control. In the words of one respondent: “many people [in our firm] just focus on our customers and don’t look any further. It would only make things more complicated and there is little we can do about it.”

Other respondents realize that derived demand complicates B2B marketing and requires them to look beyond their immediate customers and design marketing efforts directed at all relevant parties in the supply chain. These respondents emphasized that they struggle with various problems associated with derived demand. Several firms were currently exploring and testing solutions to derived demand issues, but most of them had only just started their attempts at gaining more influence over the supply chains they are a part of.

The results of our exploratory study lead us to conclude that the effective management of derived demand is ultimately an information management problem. In derived demand situations one or more parties separate the supplier from the ultimate customer. This separation may cause problems in (1) obtaining information about downstream markets (e.g. about critical parties, decision makers, and their wants and needs), and (2) providing downstream markets with relevant information (i.e. targeting them with marketing efforts and developing effective relationships) (see Figure 1).

Thus, while managers are well aware of the fact that their business is affected by derived demand issues, several barriers related to obtaining and providing relevant information prevent them from effectively dealing with derived demand. These barriers are discussed below.

Value of the product to downstream customers

Providing information to downstream customers requires the information to be meaningful for these downstream customers. The critical issue is whether or not the product has significant value for downstream customers. Answering this question requires the supplier to develop supply chain value models that demonstrate how much every supply chain member stands to benefit from adopting (a product with) the supplier's ingredient. For instance, a supplier of ingredients for the apparel industry developed such models to convince downstream customers that a higher-quality ingredient increases effectiveness and lowers costs. The development of these models required a lot of time and effort, as well as detailed information about manufacturing processes used throughout the chain. To develop them, the supplier even hired people specialized in the manufacturing processes of downstream customers.

If the supply chain value model shows that the product lacks significant value for downstream customers it will be hard to convince them. Suppliers may then try to increase their product's value through product development, cost reduction or by offering supplementary services such as assistance with product development or manufacturing (Anderson and Narus, 1995).

If the supply chain value model demonstrates that the product does have significant value for downstream customers, the supplier's efforts may still be thwarted if downstream customers do not recognize this value. Our study indicates that supply chain members frequently need to be educated about the value of an upstream supplier's product. For instance, the above mentioned supplier to the apparel industry found that most shirt manufacturers (the downstream customers) have no idea how a specific starch specialty used by a blender (the immediate customer) affects their shirts' quality or cost. Moreover, a starch manufacturer would have a difficult time explaining it to them as these effects are very indirect and difficult to measure. Supply chain value models help to make the value created for downstream customers explicit by quantifying the product's impact on the downstream customers' business.

Once the added value for downstream customers is clear, a supplier is better equipped to target these downstream customers and convince them to switch to their ingredient. Armed with information about downstream customer demand for products with the ingredient, the supplier may make a more convincing case for immediate customers to switch to its ingredient. For instance, a manufacturer of food ingredients used the results from consumer research to convince skeptic immediate customers that consumers are ready for functional foods (i.e. food with specific health enhancing ingredients, like milk with extra calcium).

Attitude of immediate customers

A second barrier identified in our study is the attitude of immediate customers towards a supplier's initiatives to obtain information from downstream markets or provide information to downstream customers. Many firms near the beginning of the supply chain rely on their immediate customers for market information. But this makes them very dependent on their immediate customers and likely limits and distorts the information obtained. Several respondents indicate that immediate customers frequently act as a barrier, making effective communication with downstream markets difficult or impossible.

A number of respondents mentioned serious problems with demand forecasting because they have insufficient information about downstream markets. This lack of information hinders effective capacity planning and price setting that reflects the value offered to immediate and downstream customers. In some industries, supply chain members do not want to provide information about the demand for their products. This is particularly true for resellers that depend on fluctuations in supply and demand for their income. It may even be an industry-wide phenomenon. For instance, in the metal industry information about demand for certain types of metal is not likely to be shared.

Also, it may be difficult for suppliers to approach downstream customers because the supplier's immediate customers resist such initiatives. Immediate customers frequently want to control the selection of components and fight pressure from customers to use specific components from specific suppliers. Several respondents stated that they do not want to offend their immediate customers and therefore refrain from marketing activities directed at downstream customers. For example, ingredient branding requires immediate customers to display the ingredient's brand and they are not always willing to cooperate. A supplier to the automotive industry that suggested ingredient branding to its immediate customers was fiercely rejected. Likewise, while several respondents had seriously considered e-commerce, many doubted its feasibility. Most of them worried about the reaction of immediate

customers, since they are likely to regard the supplier's e-channel as a direct competitor. Moreover, the customers most likely to flock to the e-channel are the ones requiring only limited sales effort, while difficult and expensive to sell to customers will stay with the traditional channel. Thus, immediate customers may reject e-commerce because the supplier's e-channel picks all low-hanging fruit and leaves them the less profitable sales.

Suppliers that do initiate relationships and cooperation with downstream customers do not simply leapfrog their immediate customers. Instead, they approach downstream customers in cooperation with (or at least after notifying) immediate customers. This reduces the threat to immediate customers and may even get them to participate in joint marketing efforts. But this strategy only works if the supplier can convince all partners of the benefits of cooperation and our results suggest that immediate customers are definitely not always interested. Especially in markets with strong price competition immediate customers feel little incentive to cooperate. Some of the firms in our sample tried to change the rules of the game by persuading the most receptive supply chain members to focus on added value and cooperation instead of price and competition. But this is not an easy task and involves delicate 'sensing and probing'. Firms attempting this strategy require detailed information about the supply chain, a clear vision of where it should go and the leadership ambitions and qualities to make it all happen.

Capability to communicate with downstream customers

Companies that want to communicate with downstream customers need several new capabilities, especially when they decide to market directly to consumers. While firms near the beginning of the supply chain are well-versed in B2B marketing, consumer marketing and market research involve a whole new set of variables, issues and skills. For this reason, some of the firms in our sample decided to leave consumer marketing and research to their

customers and rely on indirect information. Others picked up the gauntlet; for instance, a food ingredient company hired a manager with extensive consumer marketing experience to investigate and target the consumer market. Another food ingredient supplier benefited from the fact that it is part of a larger organization that includes business units with consumer marketing experience.

Also, suppliers need to be able to monitor a wide range of industries affected by a wide range of different factors because products produced by a supplier at the beginning of the supply chain are typically used as ingredients for various products. A respondent from a metals supplier stated that it is almost impossible to obtain accurate demand forecasts for all industries they supply to since they are all affected by different industry-specific factors. For instance, the demand for cans is largely determined by the availability of fruits and vegetables, which depends on weather conditions in several countries, while the demand for cars depends on various economic factors that differ per region. Obviously, collecting and analyzing such detailed information for several industries is a daunting task. Especially in the case of very diverse downstream markets (e.g. both B2B and consumer markets), the required information system quickly grows to unwieldy proportions and complexity. A supplier of chemicals noted that while success in the automotive industry requires up to date information on car development projects, the packaging industry demands close attention to fluctuations in prices and demand. This led the firm to develop two separate information systems.

Suppliers also must be able to identify the right decision maker within each supply chain. For instance, a manufacturer of a fiber used in bullet-proof helmets wondered whether it should target the end users (e.g. Ministries of Defense) or intermediate customers such as weavers (who weave the fiber into cloth), pressers (who press cloth into bare helmets) or helmet manufacturers (who add the inner helmet, fastenings et cetera). The importance of such a capability is illustrated by a manufacturer of fluid handling products for the automotive

industry that only targeted immediate customers. He lost business to a competitor that actively sold a car manufacturer (i.e. a downstream customer) on the use of its ingredient, which caused the car manufacturer to overrule its supplier and demand a product with the competitor's ingredient. Our respondent explained the loss of the customer succinctly: "We did not have access to the real decision maker." As important decision makers are located further down the supply chain it becomes more difficult to identify them.

Another critical capability involves marketing to downstream customers, for instance by creating a pull effect through ingredient branding. While ingredient branding is widely discussed in the trade press and academic literature, our findings show that many practitioners are initially interested but ultimately reluctant to use it. An important reason for this reluctance is that many firms feel that they lack the required capabilities (financial resources, time, knowledge, skills) or wonder how they can ensure that end products actually contain their branded ingredient and worry about the complexity and costs of developing the required labeling system, guarantees and certification procedures. Especially for suppliers of ingredients that are used in many end products it may not be feasible to certify all customers and monitor their compliance.

Finally, suppliers may need to be able to assist supply chain members in using their product. Frequently, a customer's reluctance to adopt a new product is partly due to his inability to implement it in manufacturing. One respondent related how a new fiber caused problems for both immediate and downstream customers because it required modifications to existing manufacturing processes. The fiber supplier decided to build an application lab to study the various customer-manufacturing processes and advise immediate and downstream customers on how to use the new fiber.

MANAGERIAL IMPLICATIONS

The results from our exploratory investigation suggest that an orientation on the whole supply chain rather than only on immediate customers is key to successful marketing for firms near the beginning of the supply chain. However, our findings also demonstrate that the implementation of such a supply chain orientation may be hindered by three types of barriers:

1. A lack of significant value of the product to downstream customers: without demonstrable value to downstream customers a supplier will find it impossible to initiate effective communication with downstream customers.
2. The attitude of immediate customers: immediate customers may function as a proxy for downstream customers, a partner in marketing efforts directed at downstream customers or actively resist such efforts.
3. The capability to communicate with downstream customers, including the identification of target customers, approaches to deal with them and the supporting infrastructure.

Before managers can design effective strategies to deal with derived demand they need to assess these potential barriers. If all barriers are present the supplier may in the short run do nothing else but accept the consequences of derived demand and deal with them as good as possible. For instance, the supplier may improve demand forecasting and prevent over- or underinvestment in production capacity. In the longer run the supplier must deal with these barriers.

When the major barrier is lack of value for downstream customers, managers must develop products with demonstrable value for downstream customers. Such product development activities must be based on in-depth knowledge about the supply chain, including information about what various downstream customers value as input for product

development. Insight into value creation activities and costs per supply chain level helps suppliers to determine the potential contribution and profitability of their products and services as well as to identify new opportunities for creating value (Vandermerwe, 2000). For some supply chains this may be relatively straightforward, while others may prove to be very intractable. For instance, a supplier of fibers discovered that for one supply chain it could easily chart the added value of its product for all levels of the supply chain, because its product translated into clearly identifiable new sales or lower costs for all downstream customers. But for another supply chain the supplier lacked the required application expertise to determine the product's value to the end user.

Specifying a product's contribution to the value created by downstream customers goes beyond traditional methods to estimate customer value (Anderson and Narus, 1998) and requires detailed insight into the value creation processes of downstream customers and how the firm's products and services fit in. Such detailed insight can only be obtained through intensive discussions with downstream customers, observation of customer business processes and joint exploration and quantification of the supplier's contribution to the downstream customers' value creation processes. Since customers' perception of value change over time, supply chain mapping is not a one-time effort, but a continuous process.

When the major barrier revolves around the immediate customers' unwillingness to cooperate, managers may overcome this inertia by educating them on concepts such as value chain analysis, value creation, derived demand and supply chain cooperation. This requires a proactive attitude, with suppliers displaying the will and vision to lead the whole supply chain, starting with the immediate customers. The extent to which immediate customers are susceptible to such discussions depends on their marketing sophistication and relative market power. When immediate customers are both powerful and reluctant to cooperate, a derived

demand strategy must be implemented with care to prevent power struggles and discord within the supply chain (Cox et al., 2004).

To overcome the third barrier, a lack of capabilities to target downstream customers, suppliers must invest in developing skills and infrastructure that enhance the collection, dissemination and use of information about downstream markets. Most firms start by building an information system that deals with secondary market information obtained from trade journals, trade organizations, consultants, internet, providers of market statistics, market research firms et cetera. As the next step they gather primary data. For instance, in addition to gathering historical data about general consumer trends (e.g. usage per capita of specific products), a major manufacturer of food ingredients also researched consumer preferences and used it as input for product development and to advise immediate customers and thus position itself as a strategic partner rather than just a supplier of ingredients.

Suppliers that manage to design effective strategies to deal with all barriers are ready to target downstream customers and building their product development and marketing programs around both immediate and downstream customers.

CONCLUDING REMARKS

Changing the firm's marketing orientation by including downstream customers (i.e. implementing a supply chain orientation) requires a higher level of sophistication and new skills. Whereas marketing to immediate customers may be complex in itself, the addition of downstream customers adds a whole new level of complexity. For instance, suppliers need to chart supply chains, determine their products' contribution to the value created by downstream customers, translate these insights into effective marketing strategies and overcome various barriers to implement them successfully. While the potential rewards may be substantial, the marketing challenges increase exponentially. The design and implementation of effective derived demand strategies requires significant investments in

market information systems, as well as the use of appropriate incentives, metrics and accountability to stimulate the use of a supply chain perspective in marketing decision making (Day, 2003).

To our knowledge, this exploratory study is the first systematic investigation of the management issues involved in developing a supply chain orientation and translating it into effective marketing strategies. Suppliers of products that offer limited value to downstream customers and/or are unable to effectively target these downstream customers must design strategies to deal with the consequences of derived demand. But a more profitable approach is to increase the value offered to downstream customers (e.g. by changing product characteristics or offering additional services) and improving the firm's ability to market to downstream customers. More research is needed to study the circumstances that determine the appropriate derived demand strategies and their pay-off. In addition, managers need tools to analyze supply chains and estimate the returns of supply chain strategies. Other promising areas of research might address the effects of a supply chain orientation on downstream customers, the benefits to immediate customers, and the interaction between immediate customers and downstream customers. The results from such follow-up studies will contribute significantly to the supply chain literature and help managers to design and implement more effective supply chain strategies.

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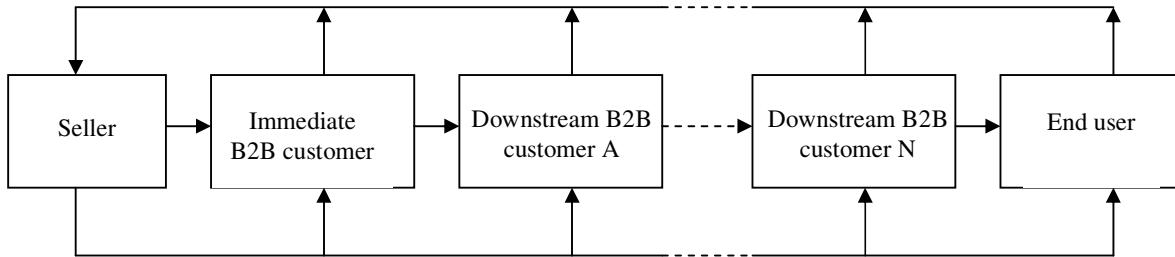
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Figure 1: Derived demand as a problem of information management

Obtaining information on

- demand per level of the supply chain
- relative importance of supply chain members
- influence of supply chain members on end-user demand
- value activities of downstream customers
- internal and external decision makers at downstream customer
- buying motives and product application



Providing information about

- relative product advantage
- contribution to downstream customer's competitive position
- indicators of added value to downstream customer (quantified benefits, performance guarantees, service level agreements)
- joint marketing efforts to stimulate downstream demand (e.g. ingredient branding)
- helping immediate customers to market effectively to downstream customers
- third party influencers in downstream markets