Coordination of the demand and supply side: A case study from the furniture industry

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Abstract: This research work investigates the occurrence of demand-supply chain management (DSCM) components in a Swedish furniture wholesaler that sources most of its products from China. Three of eight main components proposed in the literature were identified in the case company, and one component was not fully applicable. The case company’s strong focus on new product development (NPD) increased the number of end products, while the case company lost sales. The research shows possible caveats of being purely demand-driven and highlights the need to strike a balance between demand and supply chain imperatives.

Key words: Demand-supply chain management, Furniture wholesale, Sweden

1. Introduction

A chain of organizations may be described by dividing it into two parts, a demand chain and a supply chain (Jacobs, 2006). Both chains include the same actors from consumers to suppliers, with focus on different processes and activities (Hilletofth et al, 2009). In order to achieve effectiveness and efficiency the two sides require attention (Canever et al., 2008; Hilletofth, 2011; Walters, 2008). Managing the demand chain is referred to as demand chain management (DCM) and includes the management of processes responsible for understanding, creating, and stimulating consumer demand (Jüttner et al., 2007; Walters and Rainbird, 2004). Managing the supply chain is referred to as supply chain management (SCM) and includes the management of processes dedicated to fulfilling consumer demand (Gibson et al., 2005; Mentzer et al., 2001).

It has been suggested that a demand-supply oriented business model should be created by extending the area of responsibility for either DCM or SCM, in order to encompass both management directions (e.g., Mentzer et al., 2001; Srivastava et al., 1999–, Williams et al., 2002). An extended area of responsibility, however, is more frequent in literature than in practice. Hence, practitioners instead focus on
their respective management area, and coordination of DCM and SCM is achieved on a macro level (e.g., Canever et al., 2008; Hilletofth et al., 2009; Jüttner et al., 2007). Here, the demand-supply chain management (DSCM) concept proposed by Hilletofth (2010) is used to describe this overreaching management perspective.

If not coordinated properly, an imbalance between DCM and SCM may induce major difficulties (Walters, 2006), and it can be argued that DCM and SCM need to be coordinated (Hilletofth, 2011) and balanced (Jacobs, 2006) in all business environments. Organizations with a high demand chain competence that is not coordinated with the supply chain, may experience detrimental effects on cost and delivery performance, while an organization with a high supply chain competence that is not linked with the demand chain may experience inefficient new product development (NPD), segmentation, and delivery (Jüttner et al., 2007).

The purpose of this research is to investigate the concept of DSCM in a new industry. Previous research has focused on the appliance industry (e.g., Hilletofth, 2009; Hilletofth et al., 2009; Hilletofth et al., 2010). This research studies the previously identified components of the DSCM in the furniture industry. The issue is investigated through a case study including a Swedish furniture wholesaler (Alpha), active in Northern Europe. The research is based on an embedded single case study, aimed at investigating coordination of consumer driven NPD and SCM. The study was initiated 2009 with in-depth interviews with key informants at the case company.

The remainder of this paper is structured as follows: A literature review of DSCM components are presented in Section 2, the research methodology is presented in Section 3, case study findings are presented in Section 4, an analysis is made in Section 5, and Section 6 contains a concluding discussion.

2. Literature review

DSCM is an integrative philosophy for coordinating and managing the demand processes (DCM) and the supply processes (SCM) within a particular company and across the entire demand-supply chain (Hilletofth, 2010). The aim is to gain a competitive advantage by providing superior consumer value as cost-efficiently as possible (Hilletofth, 2011; Jüttner et al., 2007; Walters and Rainbird, 2004). It is achieved by organizing the company around understanding how consumer value is created efficiently (managing the demand chain), how consumer value is delivered efficiently (managing the supply chain), and how these management directions can be coordinated (Figure 1).

The underlying principle is that both DCM and SCM are of vital importance to every organization and that they must be coordinated to maximize effectiveness and efficiency (Hilletofth, 2010; Jacobs, 2006). The management of the demand side of the company (DCM) is revenue-driven and focuses on effectiveness, while the management of the supply side (SCM) tends to be cost-oriented and focuses on efficiency. Obviously, these management directions together determine the
firm’s profitability and thus need to be coordinated, which requires a demand-supply oriented management approach. The focus in DSCM is both on revenue growth (effectiveness) and cost reduction (efficiency), since the mission is to gain a competitive advantage by developing desirable products and delivering them through tailored supply chain solutions, while concurrently managing the demand and supply processes as cost-efficiently as possible (Hilletoft, 2011).

Fig. 1. Demand-supply chain management (Hilletoft, 2011)

Eight components of DSCM have been proposed and described in the literature (Figure 2). The first component (market orientation) states that the entire demand-supply chain must be aligned to serve the consumers (market-driven) with greater consumer value, i.e. to create and fulfill consumer demand as cost-efficiently as possible (e.g., De Treville et al., 2004; Heikkinä, 2002; Jüttner et al., 2007). In order to coordinate the demand and supply processes, meaningful and actionable market segmentation based on market intelligence is required (Hilletoft, 2009; Jüttner et al., 2007, Langabeer and Rose, 2004).

The second component (coordination of the demand and supply processes) highlights that market orientation is achieved by understanding how consumer value is created and delivered in a cost-efficient manner, and how these demand and supply processes can be coordinated (e.g., Canever et al., 2008; Esper et al.,
In essence, it means that neither DCM nor SCM should set the business agenda (Jacobs, 2006). Both management directions should be coordinated and given equal attention. Practitioners within each direction should focus on their area of expertise, and coordination is achieved through management on a macro level. The coordination needs to develop from an internal to an external scope.

Fig. 2. The components of demand-supply chain management and their linkages

The third component (viewing the demand and supply processes as being equally important) stresses that demand and supply processes must be regarded as equally important, and managed in a coordinated manner (e.g., Hilletofth et al., 2009; Jacobs, 2006; Langabeer and Rose, 2004; Rainbird, 2004; Walters, 2008). A company with focus on one management direction faces the risk of a business model, where one management direction dictates the business model. Instead, both DCM and SCM should be involved in the development and execution of the overall business strategy. This requires support from senior management, and well-constructed key performance indicators and incentives (Rainbird, 2004).

The fourth (value creation in the demand and supply processes) and fifth (differentiation in the demand and supply processes) components address the importance of value creation in both demand and supply processes as vital areas for increased competitiveness (e.g., Al-Mudimigh et al., 2004; Hilletofth and Ericsson, 2007; Vollmann and Cordon, 1998; Walters, 2008). Value creation has extended its scope from demand processes to also include supply processes as a
response to brutal competition and fragmented business environments. In DSCM, synergies between DCM and SCM give a foundation for value creation. Superior consumer value is achieved through differentiation from competition with regard to both products and supply chain solutions (e.g., Esper et al., 2010; Jüttner et al., 2007).

The sixth (innovativeness in the demand and supply processes) and seventh (responsiveness in the demand and supply processes) components recognizes innovation and responsiveness as two of the most important opportunities for both product and supply chain differentiation (e.g., Canever et al., 2008; De Treville et al., 2004; Jüttner et al., 2007; Selen and Soliman, 2002). Innovativeness and responsiveness in demand processes refer to rapid and reactive development of innovative products, and to the development of innovative supply chain solutions with rapid and reactive product delivery in the supply processes.

The eighth component (cost-efficiency in the demand and supply processes) implies that the components mentioned above should be carried out in a cost-efficient manner (e.g., Jüttner et al., 2007; Rainbird, 2004). In accordance with the macro management perspective of component two, cost-optimization should be conducted from a holistic and coordinated approach to avoid the inherent risk of sub-optimization associated with micro management.

3. Research methodology

The research aims to explore the occurrence of DSCM components in the case company. Empirical findings are based on results from an embedded single-case study, devoted to investigating the effects of a consumer driven business approach has on business processes. The investigated events are contemporary, and occur in a complex setting in which the researchers have no control. The chosen approach is appropriate for explorative research (Yin, 2008). Due to the complex setting of the case, the findings from the case company must be explained in relation to the context (Flick, 2009). This has required several data sources, containing both qualitative and quantitative data. The data collection was initiated in 2009 by reviewing internal documents, and by conducting 60-90 minute long in-depth interviews with key informants representing senior and middle management.

In order to increase construct validity (Yin, 2008) a chain of evidence has been built by performing additional interviews, participating in internal and external meetings, visiting customers and suppliers and reviewing secondary data, and informants has been allowed to review reports, transcripts and findings. In total, 35 interviews, 96 annual reports, about 500 internal documents and reports, and visits to about 20 supply chain partners constitute the empirical foundation of this research.

To increase internal validity (Yin, 2008), rival explanations for the findings have been discussed with other researchers, and the involved case company. The triangulation of data, methods, and theory has contributed to improved rigor,
depth, and breadth of the results, which is comparable to validation (Yin, 2008), and helps the investigators to gain a more complete understanding of the studied phenomenon (Scandura and Williams, 2009).

4. Case study findings

Before presenting the case company, a brief introduction to the furniture industry is given in order to present the context in which the phenomenon is studied. Nine competitors similar to Alpha were identified, one of which has gone out of business, two manufacture in Sweden, two manufacture in Europe, three have manufacturing in Europe and Asia, and two (Alpha included) have manufacturing in Asia. Companies that manufacture in Asia have outsourced both manufacturing and materials sourcing to the manufacturer. Furniture has a low volume value, and needs to be transported cost-efficiently using container ships.

Wholesalers keep inventory and sell display pieces to retailers. As soon as a consumer makes a purchase at a retailer, an order is placed with the wholesaler, whereupon the product is shipped to the retailer, who is responsible for finding a suitable final delivery method to the consumer. The life cycle of furniture may be very long. Some of the best selling furniture and furniture collections in Sweden today are more than 50 years old.

The case company has adopted a strategy where it attempts to offer added value by gaining insight to consumers’ needs. The case company has defined DCM as the major business process, with SCM as an enabling function. In order to operationalize their strategy, the company has developed a strategic market plan (SMP). Guidelines for DCM, and SCM are included in the SMP, but emphasis is put on DCM.

4.1 Demand chain management

Alpha’s process for developing consumer-focused products is described within the DCM approach. It is adopted for all target markets, with the purpose of managing products across their lifecycle. The CEO has the over-reaching responsibility for DCM, while the managers of NPD, purchasing/logistics as well as marketing are responsible for assigned areas. As of today, the areas are not clearly defined. The three main phases of Alpha’s DCM approach are market intelligence, product creation and commercial launch.

The aim with the market intelligence phase is to, in line with the SMP, ensure clear identification and prioritization of opportunity areas. The SMP is closely connected to the case company’s segmentation model, called the product platform. The product platform is used to differentiate consumer groups, design styles, and rooms. Consumers are divided into three psychographic segments: Innovator, Trendy, and Adapter. These consumer groups are used for all target markets. The
products are divided into three design styles: Contemporary, Nordic, and Classic. These are combined into a 3x3 matrix. Moreover, one matrix for each furniture group is created, for example, dining and bedroom, and furniture in each matrix is color-coded based upon its life cycle. Together with the SMP, the product platform constitutes an important tool for the strategic as well as tactical decision-making, for example, introduction and removal of products. Discovered consumer opportunities may be converted into innovative solutions possible to implement in all segments.

The close connection between the SMP and the product platform helps to ensure correct prioritization of activities and to maintain coherence. One of the main goals when identifying consumer opportunities is to find implicit consumer needs, and to gain consumer insight. Thus, consumer opportunities are important during both market intelligence, and product creation. Consumer opportunities include visiting potential and actual consumers in an everyday setting and photo-documenting their homes. External personnel, supported by the case company, perform the study of consumers’ homes.

The object with the product creation phase is to define and develop consumer relevant and innovative products, addressing understood consumer needs. The first step, also discussed above, is consumer opportunities. Based upon an assessment of the product platform, and the SMP, a room or furniture type is targeted. During primary development a number of squares in the product platform is targeted. The decisions of the designers are restricted to their targeted square, but also to a list of pre-chosen materials, called the materials matrix. The NPD manager is responsible for the materials matrix. Choice of materials is limited to secure sourcing, but also to ensure coherence and flexibility between different furniture collections.

To ensure successful NPD, a large amount of time is invested during the early DCM stages. However, the external personnel (mainly students) invest most of the time, while internal personnel guides the project. Hence, the economic investment is kept at a minimum during the opportunity identification process. New products have been well received among the retailers. “You are really good at making new furniture. They have great features, and offer a lot of flexibility for the end consumer”, one storeowner told to the CEO at a meeting. Still, the growth in sales is missing. Both the case company, and many storeowners believe that the turmoil in the national and global economic situation is to blame.

4.2 Supply chain management

As with DCM, SCM strives to be end-user focused. It is important that all supply chain activities, from choosing the right raw material, to handing over the finished product to the consumer and then to be prepared to help consumers even after the purchase is completed. Even though the case company’s DCM does not contain instructions for all supply processes, the manager of purchasing/logistics is present in NPD, and by developing new products using pre-chosen materials, logistics has a strong presence in DCM activities.
Being in the premium price range, Alpha is always compared to other premium firms and consumers expect the quality to match the price. Consumers that buy furniture in lower price ranges accept variations, for example, wood color and sprigs. However, when the price increases, every detail is scrutinized. Therefore, companies selling at premium price always need to undertake their supply chain activities with excellence. Senior management has identified four areas in which excellent supply chain performance is needed: Quality, Cost-efficiency, Flexibility and Reliability.

To ensure premium quality, the serving team in China plays a vital role. They employ quality control personnel at most of the factories in China. Furthermore, they help to keep shipping costs down by coordinating and consolidating goods from nearby manufacturers. The calculated shipping cost for a 40” high cube container has tripled in recent years, which makes load-filling rates very important. Further, the interactions with the serving team have increased to an extent where it now almost is on a daily basis. In order to increase flexibility, without proportionally increased complexity in sourcing and warehousing, a postponement strategy is utilized.

Instability in manufacturing in China together with imbalances in materials and container flows has caused insecurities in sourcing and resulted in prolonged lead-times with about 50 percent. Moreover, the increased number of products along with the loss in turnover has increased the number of articles in each order and container, complicating the manufacturing processes. Further, the increased complexity due to increased article numbers, and sourcing problems has lead to both stock outs and abundance in the warehouse. In turn, this has lead to lost sales and impaired utilization of invested capital. Hence, communication with the serving team and manufacturers has become more vital.

In an attempt to outperform the competition, the company tried to deliver all products to customers the day after an order had been placed. The case company discovered that fast deliveries drive costs, were hard to handle for the retailers, and that consumers did not expect quick deliveries. Hence, fast delivery meant that the company over performed toward the consumer. Nowadays the main focus is to deliver at the agreed upon time. Also, stores are welcome to pick their goods up at the warehouse, while about 4% of incoming containers are shipped directly from the port of Gothenburg to a retailer. The supply chain is now adapted to fit the needs of the customers and the end-users, providing a variety of options. The case company configures different supply chain solutions that are the results and combinations of the manufacturing and delivery strategy.

4.3 Coordination between DCM and SCM

Alpha acknowledges that demand and supply processes have to be coordinated in an effective and efficient way. It is important that demand creation and fulfillment are coordinated and treated as equally important and that value creation is not restricted to products, but also includes the supply chain solutions. However, it is
evident that the case company has not fully incorporated this into their business model. One way to illustrate the case company’s balance between DCM, and SCM is to plot the company’s total sales, with their number of articles (Figure 3). The great increase in article numbers, resulting in increased supply chain complexity is a great example of the lack of focus on the SCM processes. The quota has dropped with more than 50%. There are two main reasons for the decline in sales per article number. Firstly, the focus on DCM processes has resulted in consumer opportunities that have been converted into products. Secondly, furniture wholesalers have lost sales the last years. The decline in sales came about at the same time as the decline in economy in 2008. Albeit the case company has faced these problems in the last few years, there has been an increase in average contribution margin of 8 percent. The increase in contribution margin is not a result of increased efficiency (production and shipping costs have increased), but of increased sales prices. This might imply that prices were too low, but the increased prices are also likely to have contributed to the decline in sales.

![Figure 3. Sales per article number, 2004 indexed 100](image)

One great factor in the coordination between DCM and SCM is the lack of control over the retailers. The success of an innovative product heavily depends on the sales persons’ ability and desire to sell the furniture. The ability may be affected by knowledge about the products, the way they are developed, and the flexibility offered. The wish to sell the furniture may be affected by several factors. For example, some stores import their own furniture and give the sales
representative monetary incentives for selling their own furniture. Moreover, it is also evident that there are factors related to emotions and path of lowest resistance. One storeowner revealed that he considered dropping one distributor, since their customer representative is difficult to talk to on telephone. Many retailers also shared the opinion that consumer complaints are extremely time and energy consuming and that they avoid selling brands that they have had problems with in the past. The value added through DCM might therefore be reduced due to various kinds of distortion in the supply chain. In order for the case company to reach the full potential of DSCM there is a need to give equal attention to DCM and SCM.

5. Analysis

The literature review has revealed eight major components of DSCM, and these, to varying degrees, have also been identified in the case study (Table 1). The first component of DSCM identified in the literature review was market orientation. Alpha has realized the importance of implementing a demand-supply oriented business in their highly competitive and fragmented market. The nature of Alpha’s marketplace forced the company to become more innovative, differentiated, responsive, and cost-efficient in order to avoid competition on lowest price, and to maintain profitability.

The second component identified in the literature review was coordination of the demand and supply processes. The case company manages the demand and supply processes with some internal coordination. The processes have gone through great revisions during the shift in business model, but still lack in internal and external coordination. Furthermore, managers within the demand side have a strong impact on the performance on the supply side processes.

The third component identified in the literature review was viewing the demand and supply processes as being equally important. Currently, the case company can be classified as a demand chain master. The demand side has great influence over the supply side. Even though supply capabilities are considered during demand processes, the supply side has a support role to the demand side.

The fourth and fifth components identified in the literature were value creation as well as differentiation in the demand and supply processes. The case company has a high focus on creating desirable products differentiated for each consumer segment. However, the differentiation and value creation in SCM is extremely limited. One reason is probably that the retailers are responsible for deliveries to the consumers, which makes it hard to align processes over the demand-supply chain.

The sixth and seventh components identified in the literature review were innovativeness as well responsiveness in the demand and supply processes. The case company has developed products with a high level of innovation compared to the industry, but the innovativeness in the supply chain solutions is not as high.
The need for reactive and rapid NPD is not considered to be important in the industry, since it is still slow moving. Product delivery is carried out in a flexible manner, making it both reactive and rapid.

The final component of DSCM identified in the literature review was cost-efficiency in the demand and supply processes. The company sources from a low cost country, and has adopted several strategies to reduce costs. However, rising prices in shipments have led to an increase in shipping prices. Albeit not traced, the cost for NPD is kept low by utilizing external personnel on a needs basis.

<table>
<thead>
<tr>
<th>Components found in the literature</th>
<th>Case study</th>
</tr>
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<tbody>
<tr>
<td>1. Market-orientation:</td>
<td></td>
</tr>
<tr>
<td>(a) Market-driven (consumer)</td>
<td>(a) Yes</td>
</tr>
<tr>
<td>(b) Market segmentation</td>
<td>(b) Yes</td>
</tr>
<tr>
<td>(c) Market intelligence</td>
<td>(c) Yes</td>
</tr>
<tr>
<td>(d) Consumer value oriented</td>
<td>(d) Yes</td>
</tr>
<tr>
<td>2. Coordination of the demand and supply processes</td>
<td>No</td>
</tr>
<tr>
<td>(a) Internally (intra-organizational)</td>
<td>(a) Some</td>
</tr>
<tr>
<td>(b) Externally (inter-organizational)</td>
<td>(b) No</td>
</tr>
<tr>
<td>(c) Macro-management</td>
<td>(c) No</td>
</tr>
<tr>
<td>3. Viewing the demand and supply processes as equally important</td>
<td>No</td>
</tr>
<tr>
<td>(a) Neither demand nor supply focused</td>
<td>(a) No</td>
</tr>
<tr>
<td>(b) Both involved in setting the business strategy</td>
<td>(b) No</td>
</tr>
<tr>
<td>(c) Demand and supply chain strategy linked</td>
<td>(c) Some</td>
</tr>
<tr>
<td>(d) Senior management involvement</td>
<td>(d) No</td>
</tr>
<tr>
<td>4. Value creation in the demand and supply processes</td>
<td>No</td>
</tr>
<tr>
<td>(a) Desirable products (innovative, customized, and affordable)</td>
<td>(a) Yes</td>
</tr>
<tr>
<td>(b) Differentiated supply chain solutions (consumer service)</td>
<td>(b) Some</td>
</tr>
<tr>
<td>5. Differentiation in the demand and supply processes</td>
<td>No</td>
</tr>
<tr>
<td>(a) Product differentiation</td>
<td>(a) Yes</td>
</tr>
<tr>
<td>(b) Supply chain differentiation</td>
<td>(b) Some</td>
</tr>
<tr>
<td>6. Innovativeness in the demand and supply processes</td>
<td>No</td>
</tr>
<tr>
<td>(a) Innovative products</td>
<td>(a) Yes</td>
</tr>
<tr>
<td>(b) Innovative supply chain solutions</td>
<td>(b) No</td>
</tr>
<tr>
<td>7. Responsiveness in the demand and supply processes</td>
<td>Yes</td>
</tr>
<tr>
<td>(a) Reactive/rapid development of products</td>
<td>(a) No</td>
</tr>
<tr>
<td>(b) Reactive/rapid delivery of products</td>
<td>(b) Yes</td>
</tr>
<tr>
<td>8. Cost-efficiency in the demand and supply processes</td>
<td>Yes</td>
</tr>
<tr>
<td>(a) Cost-efficient development of new products</td>
<td>(a) Yes</td>
</tr>
<tr>
<td>(b) Cost-efficient delivery of products</td>
<td>(b) Yes</td>
</tr>
</tbody>
</table>

Of the eight components of DSCM, three (1, 7, 8) were fulfilled at case company Alpha, and five (2, 3, 4, 5, 6) were not fulfilled. Albeit component eight is fulfilled, the transport costs have increased during 2009; hence, component eight is only fulfilled in theory, and not in practice. Of the ones not fulfilled, two (4, 5) were
almost fulfilled. Component seven (reactive and rapid NPD) is perceived as not important in the investigated furniture industry.

6. Concluding discussion

This research set out to determine the occurrence of DSCM components at a furniture wholesaler. The case study revealed that Alpha had implemented three of eight components. The research has contributed to acknowledging the components as important in the furniture industry, except for reactive and rapid NPD in component 7. As a matter of fact, the focus on NPD without control of the supply chain complexity has caused problems with sourcing and inventory management. This confirms that coordination of demand and supply processes (component 2), and viewing demand and supply processes as equally important (component 3) are important components.

About six years have passed since the case company altered its business model from supply to demand driven. It has not actively focused to balance demand and supply processes, but rather focused on the demand side of the company. This raises two important questions about DSCM. Firstly, how long time does it take to implement a DSCM business model? The lack in performance the first six years may then be seen as an implementation cost. Secondly, what would the results have been if the company had focus both demand and supply processes? A more balanced demand-supply approach in the business transformation may be a better way to change the management and business directions.

The main theoretical implication is that the DSCM framework has been compared with the furniture industry. The framework was found to be applicable with one modification. The main practical implication is that practitioners need to consider the coordination and balance between demand and supply processes. It is vital to organize the firm around understanding how consumer value is created efficiently, how consumer value is delivered efficiently, and how these demand and supply processes can be coordinated. Such management approach generates opportunities to avoid price competition, maintain profit margins, and at the same time, keep production in home market. This implies that SCM must receive higher authority and that logisticians should be involved in demand processes impacting on the performance and success of the supply chain.

In future research it is important to investigate how the DSCM concept relates to different industries. This may be done with both case studies and with surveys. Moreover, there is a lack in research on the business transformation process. The case company clearly displays the uncertainties with undertaking a transformation process, and what the potential pitfalls may be.
References


