

Supply Chain Segmentation in the Sporting Goods Industry

The purpose of this paper is to explore the factors that influence supply chain segmentation when selling to consumers through retail chains. The initial research is based on a review of supply chain segmentation literature and the application of relevant parameters to a specific case study, comprising two major brands in the sporting goods industry. The empirical research itself comprises semi-structured interviews, covering demand planning, sales, marketing and supply chain managers, supported by quantitative demand data. The case study demonstrates that a number of the existing frameworks are relevant but that none are adequate by themselves. It also shows the importance of linking segmentation of the end consumers to that of the retail intermediaries. The paper provides an exploratory supply chain segmentation framework for companies selling to end consumers through intermediary retailers, aligning their marketing, sales, demand planning and supply chain functions.

Keywords: supply chain segmentation; demand chain management; retail; marketing; sporting goods industry

1. Introduction

There has been a multitude of supply chain segmentation frameworks proposed since Fisher asked the question “What is the right supply chain for your product?” in 1997. Most of these have been based on two-by-two matrices. However, different parameters are chosen by different authors, ranging from supply characteristics (Naylor *et al.* 1999) to the nature of the product (Lovell *et al.* 2005), demand volatility (Christopher *et al.* 2006) and buying behaviours (Gattorna, 2006). It therefore appears that, in fact, many parameters may be involved. Although some attempts have been made to incorporate a number of these together (such as Christopher *et al.* 2009), this is still an area where research is required to understand supply chain segmentation more fully. In particular, while many of the existing papers examine supply chain segmentation in relation to serving a firm’s direct customers, the role of segmentation when serving the end consumer through intermediary retailers has not been explored. This situation arises, for example, when a sports brand targets a specific consumer

segment, such as marathon runners, by developing a bespoke marketing campaign for the retailer where that segment is most likely to shop, i.e. a specialist running store. This research uses a case study approach of two brands in the sporting goods industry to explore this scenario.

The case study selected examines the situation that arose following the merger of Adidas and Reebok, where the Board of the newly formed “Adidas-group” encouraged the Reebok brand to adopt Adidas’ market segmentation strategy and supply chain models. The research aim is to determine whether the segmentation matrices presented in the literature adequately cover an occasion where manufactures sell to consumers through intermediary retailers or if a new segmentation framework is required.

2. Supply Chain Segmentation

Over the past 15 years the supply chain literature has introduced several methods for segmentation using criteria as diverse as product characteristics, demand and supply attributes, order winning criteria, customer behaviours and visibility of demand data. All these authors agree that a “one size fits all” supply chain is a thing of the past, yet, they use very different parameters for supply chain selection. Fisher (1997) was the first to state that “the root cause of the problems plaguing many supply chains is a mismatch between the type of product and the type of supply chain” (p.106). He created two categories to define products; “functional” and “innovative”. Functional products include staple goods with long life cycles and stable demand necessitating an efficient process whilst “innovative” products have short life cycles and unpredictable demand requiring a responsive process.

Lovell *et al.* (2005) also explored supply chain segmentation by examining product characteristics. They introduced product-value density which evaluates the ratio between value and physical weight or size. Items with high product-value densities, such as

microchips, should be manufactured in a few centralized large-scale plants whilst low product value density items, such as packaging, require production on a decentralized basis as close to the point of consumption as possible. Furthermore, they analyzed product handling characteristics stating that perishable goods are very different from fragile goods, which are different from hazardous goods. These factors then influence the nature of supply-chain design, including the type of packaging, the mode of transport and the type of storage.

Naylor *et al.* (1999) developed a two-by-two matrix based on the demand for variability in both products and production, and related these to lean and agile supply chains (i.e. low levels of variability requiring lean supply chains and high levels agile supply chains). Mason-Jones *et al.* (2000), Christopher and Towill (2000) and Aitken *et al.* (2005) also segmented by lean and agile supply chains, but developed a two-by-two matrix that uses market qualifiers and order winners to determine the appropriate supply chain response. Where cost is the order winner then a “lean” supply chain is recommended and where service level is the order winner then an “agile” solution is proposed.

However, these segmentation strategies do not acknowledge the importance of supply lead times, which have become increasingly relevant with the globalisation of trade. To address this, Christopher *et al.* (2006) developed a two-by-two matrix which contrasts the predictability of demand against supply lead times. They stated that four supply chain types can be selected, namely: agile/quick response, lean, continuous replenishment and postponement. Specifically, when demand is unpredictable and lead times are short (measured in weeks), an agile/quick response supply chain should be selected. Conversely, when demand is predictable and lead times long then a lean supply chain should be used to lower costs.

Childerhouse *et al.* (2002) and Christopher *et al.* (2009) considered that more factors were at work and suggested five key variables, namely: duration (length /stage of product life cycle), window (delivery lead time / window), volume (Pareto classification), variety (of product form) and variability (of demand). Payne and Peters (2004) added the following to this list: order-line value (i.e. the price of a specific article and size on an order) frequency of order-lines, order-line weight, substitutability of product and number of customers.

In terms of the resultant supply chain design, most of the segmentation approaches lead to a mix of lean and agile solutions, and assume these are possible. Yet, several authors argue that to enable supply chain segmentation all actors in the supply chain, need to have the capability to read and react to demand data. Holmstrom *et al.* (2000), balanced the advantages of moving the order penetration point up the supply chain to benefit suppliers against moving the value offering point down the supply chain to benefit customers (see also Hoover *et al.*, 2001). Collin *et al.* (2009) put forward the demand supply network approach which combines product and customer driven supply chain designs using the demand visibility point (DVP), the order penetration point (OPP) and the customer value threshold (CVT). DVP infers that the further downstream a supplier's involvement in a customer's operation, the easier it can react to demand and maximize the efficiency of its upstream operations. The order penetration point (OPP), which is when the customer order is allocated to the product, can affect customer satisfaction through delivery lead time as well as supplier economics. The customer value threshold (CVT) recognises that supply chain improvement needs to be noticeable to the customer to provide a competitive advantage over other suppliers – for example, in terms of speed, reliability, cost or convenience. This approach offers the prospect of supply chain segmentation based on customer capabilities as well as the supply and demand situation.

As part of their research in the apparel sector, Lo *et al.* (2005) recognised that the perceived values of both direct customers and end consumers needed to be taken into consideration in developing business strategies. Since the mid 1950's the role of the consumer has been much studied in the marketing segmentation literature (Smith, 1956; Sollner and Reece, 2001) but up until Gattorna (2006) consumer behaviour was not used as a factor for supply chain segmentation.

Gattorna (2006) made the argument that segmentation parameters need to go beyond just product characteristics, demand/supply attributes and order winners. He considered that a company should begin by re-segmenting customers along buying behaviour lines, shaping a specific value proposition and then reverse engineering from there. He identified four key buying behaviours:

- “Understand Me” requires a collaborative approach, is normally associated with a stable “base flow” demand pattern, and the most suitable type of supply chain is continuous replenishment.
- “Be Consistent” requires an efficient response, normally exhibits a fairly stable or “semi-wave” flow pattern and is suited to a lean supply chain.
- “Respond” is often associated with new styles or innovations, exhibit a “surge” demand pattern and requires an agile supply chain.
- “Surprise” necessitates innovative solutions, is associated with unpredictable “cavitation flows” and requires a fully flexible supply chain.

Gattorna (2006) mapped these to a two-by-two matrix with the variables of demand predictability and relationship to customer. He also introduced the concept of “dynamic alignment” which allows the supplier to switch between the four supply chain types as the needs of the customer change.

The relationship between suppliers and retailers in serving consumers has been much researched but largely related to the aspects of planning and collaboration (e.g. Barratt, 2004; Lummus *et al.* 2003; Adebajo, 2009). Godsell *et al.* (2006) related buying behaviour of end consumer groups to supply chain strategy but the link through retailer types was not the focus of their paper. However, this aspect was further explored by Juttner *et al.* (2006) who showed a link between consumer, channel and supply chain and related this specifically to product life cycle management. These last two mentioned papers provide a broad framework for using segmentation to target end consumer groups through intermediaries, but both papers call for more research in to the links between these areas. This paper seeks to answer this call by providing an in-depth understanding of the role that segmentation plays when selling to end consumers via intermediary retailers. In summary, Table 1 shows the links between segmentation parameters and supply chain design variables.

[Insert Table 1 here]

3. Research Objectives & Method

Table 1 demonstrates that many matrices and parameters for segmentation exist. However, the literature has not made clear how these factors can be applied in a company selling to consumers through intermediary retailers. . This paper examines the methods used by the Adidas brand to segment end consumers and retailers and how Reebok began to implement a similar strategy following the merger in 2006. Based on an in-depth literature review and case study, the advantages and limitations of existing segmentation matrices are analysed. Then, a framework is developed for linking a segmented consumer base to specific retailer categories. Finally, it is shown how these factors determine the appropriate supply chain response.

The Adidas and Reebok brands were selected because the merger in 2006 provided a rare opportunity to compare and contrast two brands as their marketing strategies and supply chains became aligned. In terms of Yin's classification (2003), this represents two embedded units of analysis within a single case study design. The rationale for a single case study design is twofold. Firstly, the one-off event of the Adidas-Reebok merger provided a unique opportunity to observe the formulation of a supply chain segmentation strategy within an organisation making this a revelatory case which could not be observed in multiple organisations (Yin, 2003). Secondly, this is a representative case for this industry as many sporting goods suppliers are selling to final consumers through intermediary retailers (ibid).

As a written history of the Adidas and Reebok merger does not exist, a method was required to elicit how each brand's supply chain processes changed post-merger. The semi-structured interview format provided this method as general questions could be asked initially and, when new details were revealed, probing questions could unearth underlying causes. Further, the semi-structured format created a private setting which allowed sensitive issues to be discussed anonymously. Following the merger, Adidas' sales and marketing staff maintained responsibility for the Adidas brand only, whilst Reebok sales and marketing focused solely on Reebok. However the customer services, demand planning (forecasting) and supply chain functions merged, giving employees dual brand responsibilities. Twenty-two Adidas-group employees were interviewed to gain a cross section of opinions of the Adidas brand segmentation strategy and how Reebok might look to adopt it. The twenty-two selected interviewees were considered experts in their particular area because they either; 1) were directly involved in marketing or selling to Adidas' retailer categories; 2) worked for Reebok in marketing and sales and faced the adoption of Adidas' segmentation strategy or 3) worked in a supply chain function and had intimate knowledge of the different supply chain

models Adidas used to deliver to each retailer category. Five interviewees were Adidas brand sales and marketing staff and five were Reebok. Two interviewees worked in demand planning and ten worked in supply chain functions. The potential interview population numbered 85 so the sample size of 22 equated to 25% of the total population. The interviews were conducted from January 1st to October 31st 2009.

There were three primary objectives of the interviews: to gauge employee opinion on what worked well in Adidas' segmentation strategy and which aspects could be improved; secondly, to determine whether Reebok could benefit from adopting Adidas' segmentation approach; and thirdly, to determine the order winning criteria for each retailer category. To achieve this it was felt the best method would be to subdivide the interviewees based on the brand they worked for prior to the merger. As such, five Adidas sales and marketing employees, one demand planning employee and five supply chain employees were grouped together as "Adidas employees". The same approach was taken for "Reebok employees". This subdivision proved invaluable because former Reebok employees highlighted clear benefits and drawbacks of Adidas' segmentation strategy as they came with an outside perspective. Furthermore, the former Reebok employees could speak directly to how Reebok might benefit from adopting Adidas' segmentation strategy.

The segmentation matrices found during the literature review were considered along with interview findings and demand planning data to develop a demand chain framework. The framework comprises demand creation (marketing), demand planning (forecasting) and demand fulfilment (supply chain) elements. The validity of this framework to other suppliers selling through intermediary retailers is considered in the conclusion section. The framework uses an example of four distinct Adidas consumer and retailer segments and four Adidas branded products in the running category. The running category is specifically addressed

because Adidas used segmentation and various supply chain models to move from 6th to 2nd position in this category in just two years. Four Adidas branded running products are analysed to determine the pattern of sales into different retailer categories. This demand planning information is used to link the segmented retail groups to the appropriate supply chain type. Information surrounding Adidas' supply chain models was received during the interview process and analysed to determine which category of retailer each model would suit best.

4. Case Study

In January 2006, Adidas purchased Reebok to build a platform from which the group could challenge Nike as the leading sports company in the world. As summarized by an Adidas senior manager during this research: "We were trying to buy size on two fronts: at the front of the chain to leverage purchases and at the end of the chain when selling to the marketplace". Before the merger Reebok and Adidas used over five hundred independent contract manufacturers based primarily in China and South East Asia (www.adidas-group.com, 2006). Many produced for both brands, allowing the merged group to gain volume discounts from suppliers and reduce complexity in sourcing. Similarly, the two brands used ocean freight to transport goods to their respective UK distributions centres (DCs), based 65 miles apart. By amalgamating the DCs, the company could reduce overheads and minimize handling and storage costs. As the majority of customers were shared between the two brands, the company could deliver on the same vehicles to retailers, reducing transport costs. Where in the past they used to compete, the two brands could now differentiate and then strategically position their ranges at key retailers. For smaller stores, Adidas used its market strength to encourage retailers to consider the Reebok brand.

However, the period following the merger brought mixed fortunes for the two companies. From 2006 until the beginning of 2009, Adidas UK sales revenues increased at a double digit rate whilst Reebok's fell 74%, from £230 to £60 million (www.adidas-group.com, 2009). Following the merger, Reebok faced three primary challenges in the UK marketplace: 1) distinguishing and segmenting product, as there was an over reliance on discount sales channels; 2) avoiding the existing dependence on one method of bringing product to market regardless of different customer requirements; and 3) transitioning from a flexible and entrepreneurial way of working to the structured and process orientated model of Adidas (Case Study Inc.com, 2009).

The first challenge was articulated in 2008 by Herbert Hainer, Adidas-group CEO: "We continue to face problems in the USA and England, which have previously been Reebok's strongest markets. In recent years Reebok products have been over-represented in the low-price segment...damaging the brand's profitability and image" (www.adidas-group.com, 2008, p.1). In particular, Reebok offered UK retailers discounts of up to 60% on its strongest selling "classics" footwear range. Adidas-group management believed that by adopting Adidas' segmentation strategy Reebok could increase average selling prices and enhance brand image (ibid).

The second challenge was highlighted as Adidas created new methods of bringing product to market, while Reebok continued to use the same 18 month creation to shelf process. Glenn Bennett, Adidas COO, stated in 2007: "Our goal is to move from the industry's 'one-size-fits-all' approach for creating and supplying product, to a segmented approach designed around different business models" (www.adidas-group.com, 2007, p.2). The Adidas brand supply chain models now bring approximately one quarter of Adidas product to market.

The final issue was highlighted as Reebok's US based entrepreneurial culture merged with Adidas' structured and process based method of working (Case Study Inc.com, 2009). Prior to acquisition, Reebok prided itself on offering excellent customer service and timely product delivery which exceeded customer expectations. Reebok often allowed orders to be placed post cut-off and would subsequently rush product through the supply chain to reach the customer's expected delivery time. Reebok felt this model provided the flexibility to win orders and gave their customer a value added service. In contrast, Adidas utilized regimented supply chain processes to ensure customers adhered to strict order cut-offs and were aware of lead times from order placement to delivery.

This paper examines the end consumer and intermediary retailer segmentation strategy of the Adidas brand and how these factors influence the configuration of different supply chain types. The research then shows how Adidas segmentation framework could be applied to another brand, in this case Reebok. It is the intention of this research to gauge whether the existing segmentation matrices in the literature can be applied to firms such as Adidas and Reebok who sell via intermediary retailers or whether a new methodology is required for this scenario.

5. Interview Results and Data Analysis

During the interview process twenty-two Adidas and Reebok employees were asked: "Since the merger, have you witnessed any change in the service level offered by the supply chain to the intermediary retailer?" Respondents were able to list as many changes as they felt were applicable, but this was usually not more than three factors.

Adidas and Reebok employees were able to comment on changes at either brand Table 2 shows three primary issues were highlighted by employees: (1) long replenishment lead times were inhibiting Reebok's ability to respond to spikes in demand; (2) Adidas' supply

chain initiatives were restricted by limited visibility of point of sale information and inventory levels at retailer locations and; (3) Reebok's supply chain had lost flexibility since the merger.; .

[Insert Table 2 here]

The first issue, highlighted by fifteen respondents, was Reebok's replenishment lead times were too long affecting the brands ability to respond to spikes in demand. Reebok utilized an 18 month creation to shelf process where seven months were spent in design and approval of the range whilst five months were needed for producing, shipping and confirming prototypes. Three months elapsed to manufacture product in Asia while another three months were required to transport finished goods by ocean freight to the UK, transition through the UK distribution centre and deliver to retail store. The Adidas brand used a 12 month lead time for standard articles and had developed several supply chain models to bring product to market in one to six months to achieve in-season replenishment. For example, Adidas shaved six months off lead times through the use of virtual samples, where only one prototype is developed and the remaining colours in the range are shown to customers on-line. Also, value stream management was used to streamline the supply chain (see Taylor, 2009). The issue of Reebok's long lead times was raised by eight Adidas employees but only seven Reebok employees. This finding is important because it shows the significance Adidas employees place on lead times and their concern that Reebok may not be able to match this response rate without adopting some of Adidas' supply chain models. .

The second issue raised by 13 out of 22 interviewees was that limited demand visibility was inhibiting the success of many of Adidas' supply chain models (see Table 2). Respondents believed this resulted from a lack of supplier-customer collaboration and a limited level of retailer sophistication. As summarized by an Adidas senior manager: "We are

getting to the point where we have access to the retailer's data in terms of sell through and what is in stock, on a weekly basis. But you don't know how much space you have by store because it is only an aggregated number and you don't know what price it was sold for. It is a level of sophistication first and foremost." (Adidas employee, 2009). Another respondent stressed the need to improve the trust in the retailer-supplier relationship and drive collaboration: "We are still at the stage where they (the retailer) could be more open with their sales data. It is not even down to margin level, so there has to be that ability for us to engage more openly on a business level with retailers, because there is still a bit of mistrust" (Adidas employee, 2009).

Finally, nine Reebok and three Adidas employees stated: "The Reebok supply chain has lost flexibility since the merger." It is interesting to note that nine Reebok employees highlighted this as an issue while just three Adidas employees saw this as a concern. This finding reveals how Reebok employees felt they lost a significant order winning criteria whilst their Adidas brand counterparts may not have realized the disadvantage Reebok now faced following the amalgamation into Adidas' structured supply chain.

5.1 Order Winning Criteria

Twenty-two interviewees were asked to list the most important order winning criteria for both Adidas and Reebok when selling to four different intermediary retailer segments. These segments include the "mi Adidas" and "Your Reebok" on-line customizable web-site, the Specialist Retailer, the Sports Generalist and the Lifestyle Specialist. Interviewees could list as many order winning criteria as they deemed appropriate. However this was typically not greater than three.

In the mi Adidas and Your Reebok segment consumers shop on-line and can design a running shoe to their exact specification, choosing from a variety of colours, styles and

innovations. The product is then manufactured and delivered to the consumer's door in twenty-one days. Table 3 shows that for Adidas the three primary order winning criteria in this segment are innovation, brand perception and flexibility (responsiveness). The mi Adidas website offers several innovative product features such as ultra-light running shoes with the ability to add climate cooling mesh to the upper part of the shoe. It was noted by eleven interviewees that while innovation is important, it is Adidas' brand perception that initially drives the consumer to the web-site. In fact, ten Adidas employees saw brand perception as the key order winner whilst only one Reebok employee held this view. This finding stresses the significance that Adidas employees give to the brand and highlights how Reebok employees give more importance to flexibility and innovation in this category. Finally, after spending time designing the shoe the consumer wants to receive his or her "masterpiece" as quickly as possible prompting seven respondents (2 Adidas and 5 Reebok) to list flexibility as a major order winner for Adidas. For "Your Reebok" the primary order winners are flexibility and innovation. This finding is significant because earlier in Table 2 several Reebok employees mentioned how Reebok lost flexibility post-merger and now in Table 3 a full eleven Reebok employees have stated that flexibility is the main order winner in this category. Interestingly, Reebok's brand perception was ranked near the bottom by both Adidas and Reebok employees, further emphasizing the current importance for Reebok to be both flexible and innovative to create a desire in the consumer to visit the website.

The second intermediary retailer segment is the Specialist Store. Table 3 shows price is not considered an order winner in this segment for either brand. This is unsurprising as a person shopping at a specialist retailer is serious about their sport and is willing to pay a premium price for the latest technology and product fit. For Adidas to win orders in this segment it needs to compete on brand perception, innovation, and fit. Again, it was the

Adidas employees that ranked brand perception and innovation at the top, while the Reebok employees put more emphasis on fit. For Reebok the order winners are flexibility, fit and innovation. Again, Reebok's brand perception was not listed by any interviewee meaning the only way Reebok could compete in this segment is to bring well-fitting and innovative articles to store as quickly as the consumer demands them.

The third segment is the Sports Generalist, which sells a wide range of sporting goods at reasonable prices. For Adidas, 14 employees (11 Adidas and 3 Reebok) listed brand perception and 11 (5 Adidas and 6 Reebok) mentioned price as order winners (see Table 3). For Reebok, 14 employees (6 Adidas and 8 Reebok) listed price while 10 (4 Adidas and 6 Reebok) listed flexibility. This finding illustrates that price is important for both brands but as Adidas has the stronger brand image it does not have to compete solely on price, whereas Reebok does. As Reebok's second order winner, "flexibility", was largely lost following the merger it is faced with only winning orders by having the lowest price. A Reebok employee explains the situation: "Feedback from the customers is: 'You are not as flexible as you used to be Reebok' and that was our unique selling proposition (USP). The product may not have been fantastic and we may have had to discount it, but it was there on time and in full. The retailer had a perception that Reebok service was very good and would stock our product on that basis" (Reebok employee, 2009).

The fourth retailer segment is the Lifestyle Specialist, which sells the latest fashion items at premium prices. Since the merger Reebok's strategy has been to segment products away from the Sports Generalist towards the Lifestyle Generalist to capitalize on higher margins. Reebok's order winning criteria for the Lifestyle Generalist are innovation, flexibility, exclusivity and product quality. Adidas also aggressively targets this high margin

segment and wins orders through brand perception, innovation and exclusivity of the product range.

[Insert Table 3 here]

5.2 Supply Chain Models

The Adidas brand has offered intermediary retailers several unique delivery solutions through supply chain models such as: Never Out Of Stock (NOOS), Special Handling at Source (SHAS), Consignment, FLASH, Special Make Up units (SMU's) and "mi Adidas". Smaller retailers like the NOOS model because they can place any size order and have the stock delivered from a DC in Germany or Holland in 2-3 days. Adidas combines all European NOOS orders to overcome minimum order quantities with the manufacture and achieve volume discounts. The Adidas brand has increased sales fivefold with retailers in the Lifestyle Generalist segment using NOOS. The Special Handling at Source (SHAS) model allows pre-labeled stock to be shipped in ocean containers directly to retailer DCs and on-forwarded to stores without re-work. This value added service is industry standard and expected by major customers. As this service is provided without additional charge, Adidas conducts the work in low wage economies such as China or South East Asia to minimise costs. Adidas has used the Consignment model to improve market position from 6th to 2nd in Specialist running stores and increased overall market share from 6 to 11%. Consignment removes retailer risk as all unsold product is returned to Adidas without charge. The objective of the FLASH model is to increase consumer interest through constantly refreshing product at retail locations. FLASH articles, sizes and colours are all pre-determined six months in advance with retailers. Packages are dropped into store every six weeks with unsold stock returned to Adidas on a sale or return basis. The model is based on Zara, who develop new ranges every 6-8 weeks to generate a sense of urgency with consumers and

encourage them to buy before the stock disappears (Christopher, 2000). In the SMU model, ranges are agreed with retailers eight months in advance and product is manufactured to their exact specification using the standard six month production and transport lead times. Retailers use SMUs as a point of difference in the marketplace and can charge premium prices for these unique products. Five interviewees stated the customization requirement of SMUs mean short lead times are required because additional orders cannot be taken from existing stock and have to be newly created. This is summarized by an Adidas employee: “SMUs require more flexibility, because you need to be able to create it, design it and plan it, in-season to capitalize on the latest trends” (Adidas employee, 2009).

In the “mi Adidas” model the high number of design variations means additional buffers of raw materials must be maintained at the factory. An unfinished mould is held and as orders are received the desired colour, size and fit are applied. This limits the amount of wasted materials as products are designed to the exact customer specification.

6. Development of the Demand Chain Framework

In the UK, the Adidas brand is structured in three general functions: demand creation (or marketing and sales); demand planning (or forecasting); and demand fulfilment (or the supply chain). This structure is basically aligned with demand chain management components developed by Christopher and Peck (2003) and Walters and Rainbird (2004) and was therefore considered to form a sound structure for the framework. The running category is specifically addressed here as the Adidas brand used segmentation and various supply chain models to move from the 6th to 2nd brand in this category in two years.

6.1 Demand creation

Adidas begins by selecting a target category and then separates the consumer based on their buying behaviour. In the running category, Adidas created four segments based on the seriousness of the athlete and their aspiration for the sport:

- *The Marathoner*: typically, a long distance runner, the consumer looks for a specialized shoe designed for high performance level. To target this customization requirement Adidas uses the mi Adidas web platform. This model allows a consumer to customize several different types of running shoes based on design, style and fit. The value proposition could be defined as “delivering a customized and innovative product at speed”.
- *Serious about Sport (SaS)*: competes on a semi-regular basis in 5km runs and half marathons. Due to this level of competitiveness, SaS demands a high quality runner at the top end of the market. Specialist running stores cater to this segment by delivering the latest innovations and selling this technology at premium prices. The value proposition for this segment could be defined as: “providing consistent availability of high quality, innovative products to meet the needs of a demanding customer”.
- *The Multi-Sporter*: is not a serious runner but trains to keep fit for his/her sport of choice. This athlete desires a reasonably priced product of acceptable quality. The Sports Generalist would be a suitable destination for this segment as it targets a price conscious consumer and stocks products to cover a wide range of activities. The value proposition could be: “a dependable running shoe which provides good value for money” and therefore suited to an entry to mid level article.
- *The Weekender*: runs occasionally to stay in shape. When targeting consumers in the Weekender segment Adidas sells a mid-range shoe to retailers that specifically targets the lifestyle and sporting needs of the casual running enthusiast. These retailers

require a supplier who appreciates the needs of this type of consumer and can deliver a stylish and comfortable product. For the Weekender, the proposition might read: “to develop stylish and comfortable products through close collaboration with the retailer which enables them to understand the needs of the running enthusiast”.

6.2 Demand planning

The Demand Planning, or forecasting, department analyzes various sales patterns so future volumes can be accurately forecasted and capacity secured at the factories. For the Marathoner segment, the amount of variations that result from customization mean a new shoe is ordered nearly every time making it virtually impossible to forecast demand, described by Gattorna (2006) as a cavitation flow. Figure 1 depicts the sales pattern of a customized Adidas running shoe article sold through the mi Adidas web platform. This high-end, be-spoke article typically sells very few units at unpredictable times throughout the year. In the SaS consumer segment, specialist running stores will sell the latest innovation so each product will be in the introductory or growth stage of the product lifecycle, resulting in extremely volatile sales patterns. Figure 2 shows the sales of a premium running shoe article in a specialist retailer and illustrates an erratic demand pattern.

[Insert Figures 1 & 2 here]

For the Multi-Sporter segment, Adidas positions the entry and mid range running shoes to the Sports Generalist. As this retailer seeks low cost product with an established level of sales, this article is typically in the mature stage of the product lifecycle and demand is predictable. Figure 3 shows the sales pattern of an Adidas entry level running shoe which sells high volumes but at low prices. The Lifestyle Generalist provides the Weekender with a consistent supply of well designed products, so the product is typically in the mature stage of

the product lifecycle and exhibits a more predictable sales pattern. Figure 4 shows the sales pattern of a medium priced running shoe sold at one Lifestyle Generalist retailer. This is a comfortable shoe of reasonable quality which exhibits a fairly stable demand pattern

[Insert Figures 3 & 4 here]

6.3 Demand fulfillment

Gattorna (2006) states products which exhibit unpredictable demand in a “cavitation” sales pattern, as in Figure 1, suit the fully flexible supply chain type. The erratic demand pattern, the need to deliver in short time periods, and the requirement for customization, means this supply chain could also be termed “agile-customization”. It is interesting to note that if either the retailer or the end consumer has a customization requirement this supply chain type can be used. For example, whilst mi Adidas is customized for the end consumer, SMUs are designed specifically for one retailer. However, both are well suited to agile-customization because products are always new introductions, so will exhibit unpredictable demand and therefore necessitate short lead times. The premium running article sold to specialist retailers (Figure 2) exhibits a volatile demand pattern similar to Gattorna’s (2006) “surge flow”. As demand is difficult to predict, Gattorna (2006) states a quick and agile response is required. FLASH, Consignment and In-Season Replenishment suit the agile-responsive supply chain as product needs to be delivered quickly and accurately to stores. Figure 3 showed how the entry level article exhibited a fairly predictable or “semi-wave” flow pattern. When a customer, such as the Sports Generalist, is price sensitive and demand is predictable Gattorna (2006) recommends a “lean” supply chain. Special Handling at Source (SHAS) suits the “lean” supply chain type as cost minimization is the key driver. For the medium priced article sold to the Lifestyle Generalist (Figure 4), the focus is on consistent delivery of mature products. Gattorna (2006) suggests the continuous replenishment supply chain when a

customer seeks a collaborative relationship and demand patterns are stable. Adidas' NOOS model is well suited to the continuous replenishment supply chain as product is mature and demand is predictable.

7. Creating the Framework

The Adidas brand has shown the first step in building a segmentation framework can be selecting a target "category" or consumer activity (i.e. running, football or fashion). Gattorna (2006) states that: "Customers always exhibit a small but finite number of dominant buying behaviours for any given category, usually no more than three, but four at most" (p.38). The running example supports this theory illustrating how the "category" is broad enough to allow four distinct behavioural segments to be defined. Nine steps are used to build the framework through a combination of Fisher's (1997) product attributes; Mason-Jones *et al.*'s (2000) value proposition and order winning criteria; Christopher *et al.*'s (2006) demand predictability and replenishment lead times and Gattorna's (2006) behavioural segmentation. These steps start with considering the end consumer and then proceeding up the demand chain, broadly in line with the demand chain management stages outlined by Christopher and Peck (2003).

Step 1: Define behavioral segments for consumers by category (i.e. Running, Fashion, Football)

Step 2: Determine where the consumer in each behavioral segment would make a purchase

Step 3: Decide upon the order winning criteria for the retailer

Step 4: Identify the value proposition for the retailer

Step 5: Define which product at which price points would suit the retailer

Step 6: Describe the demand attributes of each article sold

Step 7: Define the demand pattern of the product type for that specific retailer

Step 8: Establish which of the four supply chain types would suit that demand pattern (Lean, Continuous Replenishment, Agile-Responsive, Agile-Customized)

Step 9: Configure supply chain models to fit a supply chain type

[Insert Figure 5 here]

8. Implementing the Framework at Reebok and Improving it at Adidas

The interview process highlighted two inhibitors Reebok faced in adopting the Adidas segmentation strategy: loss of flexibility and long lead times. Furthermore, interviewees stated the Adidas segmentation model could be improved by increasing demand visibility from intermediary retailer at the point of sale.

As both brands use the same method for segmenting their consumers, source from the same locations, and deliver to the same customer base, the framework could be applicable to both brands. However, the interview process has shown that Adidas' brand perception and market share give it more leverage when encouraging retailers to adhere to its segmentation policy. The difference between Adidas and Reebok is summarized by an Adidas senior manager: "We have to recognize that Adidas is close to being the biggest brand in the sporting sector in the world and therefore can work on a certain rhythm with retailers. With Adidas you know that 80% is going to sell as planned, 10% will be more successful and 10% will be less successfultherefore the retailer is more willing to accept Adidas delivery terms because they know when they get it, it will be successful" (Adidas employee, 2009). Reebok's smaller market share and the fact they cannot win orders purely on brand perception, necessitates a closer relationship with retailers and the flexibility to adapt quickly to changing consumer needs. By applying Gattorna's (2006) theory of "dynamic alignment" to the above framework, Reebok can switch between one of four supply chain types to meet changing consumer behaviours and the subsequent change in a retailer's order winning

criteria. For example Reebok could move from a lean to an agile-responsive supply chain if the retailer urgently needed a specific product or to an agile-customized supply chain if a unique article was required.

The interview process highlighted how Reebok needed to reduce lead times significantly in order to adopt Adidas' supply chain models. One Reebok employee commented on the brand's ability to adopt Adidas' FLASH model: "There is that mentality of urgency and desire that we want to tap into, but with our business model it is very difficult to do that because of the lead time" (Reebok employee, 2009). Christopher (2000) stated "the ability to meet customer demands for ever-shorter delivery times and ensure supply is synchronised to meet the peaks and troughs of demand are of critical importance in this era of time-based competition" (p.37). The Adidas supply chain model has illustrated how, by using small batch runs and shipping via airfreight, lead times can be reduced to just 21 days. This model can be used as a template for Reebok when adopting the agile-responsive methods of in-season replenishment, FLASH and consignment. Furthermore, Christopher (2000) states the focus of the lean supply chain should be the reduction of waste, in the form of time and inventory. Any steps Reebok can take to remove time from the 18 month lean supply chain would remove inventory and the associated impact of tying up cash in stock holdings.

In order for the Adidas brand to further benefit from its segmentation strategy, real time data needs to be secured from the retailer at the point of sale. Whilst technology is a key enabler of receiving point of sale data, it will not amount to much without the necessary collaboration between Adidas and the retailer. Holstrom *et al.* (2000) stated customer and supplier collaboration is essential to integrating the customer's demand chain and the supplier's supply chain. Collin *et al.* (2009) believe enhanced visibility can be accomplished

through an understanding of the Demand Visibility Point (DVP), Order Penetration Point (OPP) and Customer Value Threshold (CVT).

The Agile Customization supply chain is perhaps the most sophisticated of Adidas' four supply chain types as it utilizes real time, end to end demand visibility. Specifically, in the mi Adidas model the OPP is at the manufacturer's premises allowing the supplier to make to order. This limits the amount of wasted materials as products are designed to the exact customer specification eliminating inventory at the UK DCs.

The Agile-Responsive supply chain suffers most from a lack of real time sales data. For Adidas, in-season replenishment means lead times must be a maximum of six months. If the OPP was at the point of manufacture, Adidas could adopt a make to order model eliminating the need for buffer inventory and providing the full benefits of the agile-responsive supply chain. The benefit of accurate orders and quick delivery would exceed the Customer Value Threshold (CVT) outlined by Collin *et al.* (2009) and drive further sales and improved relationships. The importance of suppliers collaborating with retailers in apparel Quick Response supply chains has been demonstrated by Birtwistle *et al.* (2006).

The Lean supply chain is a combination of a make to order and make to stock model. For Adidas' three largest retailers, which contribute to 60-70% of orders, a dedicated order is placed six months in advance. Adidas can then manufacture this stock to order as the OPP is at the manufacturer and the retailer is prepared to wait for six months for manufacturing and transport. The remaining 30% of stock is sourced using a make to stock system where an initial forecast is used and buffer stock held in the UK distribution centre. In this make to stock environment any improvement in the visibility and accuracy of sales data from retailers could improve forecasts and reduce stock holding.

Within the Continuous Replenishment supply chain Adidas has increased sales fivefold using NOOS model. However despite being called Never out of Stock, the interview process has shown how Adidas still experiences out of stock situations. As summarized by an Adidas senior manager: “In an ideal world that (data) would come electronically and create an automatic replenishment. We are not quite there yet, either their side (the retailer) or our side. All your data collection and all your data flow should be embedded in the production cycle and you need to have the right levels of materials and the right styles, that is more difficult for us” (Adidas employee, 2009). If the Demand Visibility Point were at the NOOS distribution centre, then Adidas could adopt a “ship to inventory replenishment method” based on a vendor managed inventory model (Collin *et al.* 2009). This would require a high level of collaboration with retailers to provide real time point of sale information and also up to date stock levels at each retail location.

For each of these supply chains, the appropriate planning approaches need to be put in place (Kaipa and Holmstrom, 2007). For example, an efficient replenishment approach is required for the NOOS model, whereas expert input is likely to be required for the agile-responsive model. So, while the supply chain models are functioning and demonstrating success, accurate and real time visibility of demand would allow Adidas to gain the full benefits of each of the four supply chain types outlined in the framework above.

The framework addressed the three primary issues raised during the interview process. Firstly, it was shown how Reebok can apply Gattorna’s theory of dynamic alignment to the framework to gain the flexibility to respond quickly to changing customer needs. Second, the framework allows Reebok to allocate products which require short lead times into the appropriate supply chain type (i.e. agile-customization or agile-responsive) and use agile techniques to bring stock to stores more quickly. Third, the model highlights the need for

Adidas and Reebok to improve collaboration in the supplier-retailer relationship and work together to improve demand visibility throughout the supply chain. This collaboration may depend on such factors as the relative power in the supply chain (as per Cox, 1999), the willingness of the other participants (as highlighted in the case of a trading company selling via retailers by Adebajo, 2009) and on customer capabilities (as highlighted by Collin *et al.* 2009). Once the three main issues highlighted in this paragraph are fully addressed, Adidas and Reebok will be able to gain the full benefits of a segmented supply chain which is aligned to a segmented consumer and retailer base.

9. Conclusions

The Adidas and Reebok case study demonstrates how a number of existing segmentation parameters may be relevant but none are adequate by themselves. The two-by-two matrices presented in the literature are an elegant way of conceptualize the theory of supply chain segmentation. However, when it comes to reality, there are more factors in play and hence a more multi-dimensional approach is needed. Segmentation should stem not just from the different groupings of the immediate customer (in this case, the retail chains) but also, and in fact more importantly, from the characteristics of the end consumer. The nine steps for constructing the segmentation framework combined Fisher's (1997) product attributes, Mason-Jones *et al.*'s (2000) value proposition and order winning criteria, Christopher *et al.*'s (2006) demand predictability and lead times, and Gattorna's (2006) behavioural segmentation and concept of dynamic alignment. It was found that once the supply chain was segmented, Adidas could derive further benefits by utilizing the Collin *et al.* (2009) concepts of Demand Visibility Point (DVP), Order Penetration Point (OPP) and Customer Value Threshold (CVT).

It should be noted that other concepts may be important in other circumstances. For example, Lovell *et al.*'s (2005) product-value density was not used as a criterion for segmentation for two reasons: (1) Adidas products are footwear or apparel meaning the density is the same across the majority of categories and ranges, and (2) the product has a relatively small value of £20 to £150. These factors restrict the degree to which it would be advantageous to assign different supply chains to product lines within a category.

The framework illustrates how the demand creation, planning and fulfilment functions in a company can be successfully aligned. By separating the organization into these three general functions the links between each can be seen. Through understanding and segmenting consumers based on their behaviours, the marketing function can determine which retail store the consumer would choose. Subsequently, the order winning criteria for the retailer can be determined and a value proposition developed to specifically target that need. Marketing can then position products to specifically target each retailer and consumer group. The framework illustrates how demand planning is then linked to marketing by forecasting the volumes and understanding the predictability of each article. Demand fulfilment then provides the correct supply chain type by understanding these demand characteristics and specifically configuring the correct production and delivery method. For this to be successful, it is imperative for the marketing and supply chain functions to work together closely, as highlighted by Lynch and Whicker (2008).

The framework developed in the Adidas Reebok case study could thus be generalised as in Figure 6.

[Insert Figure 6 here]

This research is important in developing a further insight into supply chain segmentation and in setting out a framework that is appropriate for companies serving

consumers through intermediary retailers. It demonstrates how the relevant factors from existing segmentation matrices can be combined together to form an overall framework.

From a practical viewpoint, this paper provides managers with nine clear steps on how to create alignment within their organisation. Organisational alignment is a consumer focused process, in which segments are decided based on consumer buying behaviour and marketing campaigns are targeted at where these segments are most likely to shop. Importantly, this paper has shown that segmentation should not stop at the marketing department but continue into the demand planning department and then up the supply chain. By segmenting the supply chain to support the market segmentation strategy, the firm's operations, demand planning and marketing departments become aligned and all activities in the firm operate in unison.

The paper has also shown that multiple supply chain types can co-exist within one company and be used as strategic selling tools. Adidas uses an agile-customisation supply chain to deliver small quantities of bespoke products to individual customers whilst simultaneously using a lean supply chain to bring large quantities of products to price conscious consumers and retailers. The nine steps outlined above encourage supply chain managers to build collaborative relationships with their colleagues in marketing both to deepen their insight of customer order winning criteria and also to enhance their understanding of how the factors influence supply chain design.

This research focused specifically on the sporting goods sector, selling through intermediary retailers. This raises the question of whether the framework is applicable to other brands in the sporting goods sector and in other industries where there is an intermediate customer (e.g. B2B through distributors). It would prove interesting to contrast this case study against a very different type of industry such as high technology or

construction materials to identify the circumstances in which other segmentation parameters may apply.

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