Analysis of Supply Chain Coordination of Sporting Goods OEM

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ABSTRACT

In today's dynamic market, consumer demands fluctuate constantly as customers become more educated and are more discriminating in their purchasing strategies. Manufacturers and retailers are faced with the challenge of making sure that the correct quantities of goods are placed in a location readily accessible to the final customers and at the correct price. Failing to do so can result in lost revenue to the competition in the event of a "stock out" or increased inventory carrying costs associated with "over stock". The costs associated with managing the movement of goods from the factories that make them to the store shelves where the end consumer can access them is a complicated process that can be a source of competitive advantage when optimized. The linkages between the different companies and the different business units within these companies that participate in this process are called the supply chain.

For short life cycle products, supply chain management is an integral part of keeping manufacturing companies profitable. This paper will study the coordination of information amongst the different nodes in a supply chain for a sporting goods manufacturing company. The sporting goods industry is currently driven both by functionality by fashion trends. The importance of trends places emphasis on the ability of the manufacturers to bring the product to market in the intended season. Off-season products are heavily discounted leading to large losses in potential revenue.

This paper analyzes the biggest challenges facing a major sporting goods manufacturing company as they try to coordinate factory orders to their third party suppliers with the order demands of their retail channels. Using the Balance Scorecard, three alternatives are compared to identify possible course of action to act on and improve upon the challenges currently facing "Company A". The analysis supported increasing the partnership across the supply chain without making equity investments. The other alternatives will positively affect overall supply chain performance; however,

the recommended alternative is a lot more flexible in terms of level of schedule of capital investments necessary to recoup a return.

DEDICATION

This paper is dedicated to my family, co-workers, and loved ones, who tolerated my prolonged emotional and physical absences, my impatience, and my pre-occupation during these past two years. Without your understanding, support, and the freedom afforded by all of you, I would not have been able to balance a life where my education takes precedence over my career and personal life.

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I would also like to thank the "Company A" I spent 7 weeks at. I learned a tremendous amount in terms of technical skills, inter-personal skills, and the intricacies of how large successful companies operate. They opened their doors and embraced me as one of their own. The friendships formed will be treasured forever; the foosball and golfing were just an added bonus.

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1 INTRODUCTION

Supply Chain Management has a strong influence on the survival for many organizations where mismanagement can lead to irrecoverable losses that can force a company to close down. This is especially true for companies that sell goods with short life spans (Fisher, 1999, pp. 1-2) because of the fine balance required between ensuring that product is available to the consumers while at the same time reducing obsolescence and/or costs due to inventory overages. An efficient supply chain will also reduce the total amount of cash that is tied up in inventory within the supply chain. The quicker inventory is turned over (from the time it is received to when it is shipped to the consumer) the quicker Accounts Receivable can be collected for cash; therefore increasing liquidity and the financial stability of the company.

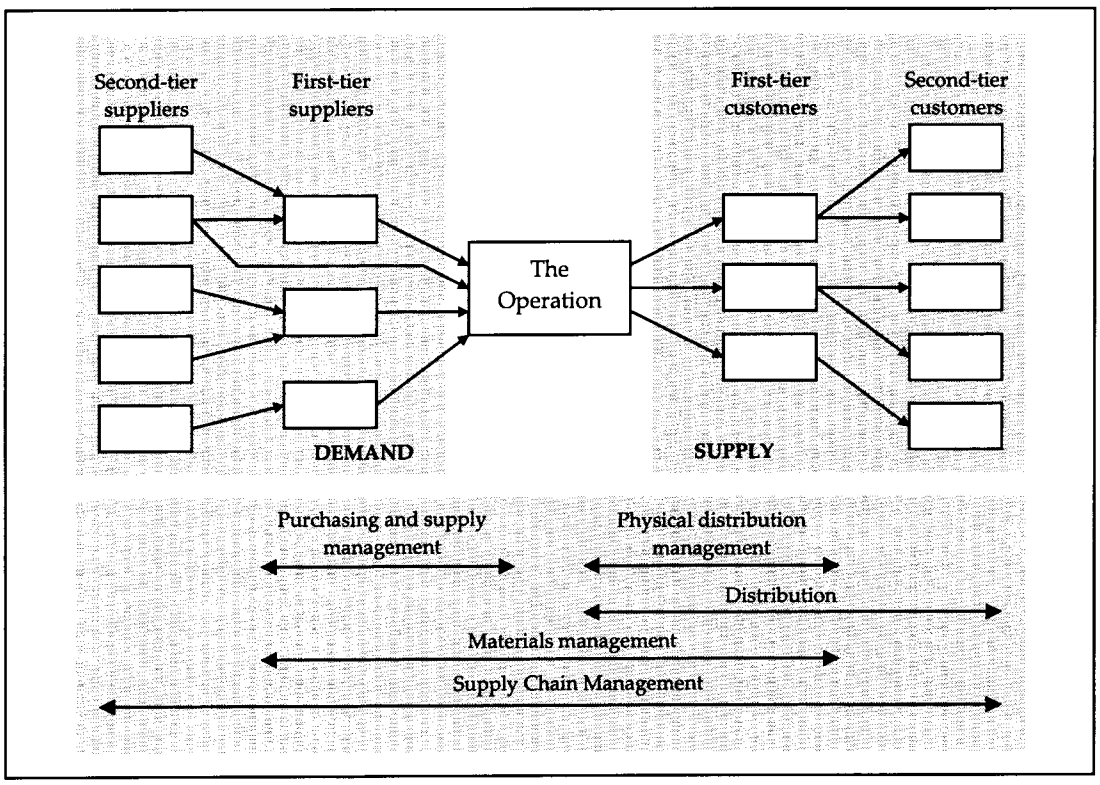
The complete supply chain of a company may encapsulate all activities starting with suppliers through to delivery of the finished product to the end customers depending on the complexity of the corporate operations. There are many variables that affect the flow of information and products across the entire chain. Efficiently managing the supply chain will lower costs and increase customer satisfaction through the *"offering of the **right product** in the **right place** at the **right time**"* (Fisher, 2000, p. 115).

1.1 The Supply Chain

The scope of the supply chain varies depending on the organization but it spans company boundaries and requires a holistic "system" perspective approach. In the case of a fully vertically integrated organization, the supply chain can include the flow of product or services and related information starting from the conception of a new product idea to the purchase of the good or service by the end customer. The activities relating to the 'first-tier' suppliers and consumers such as purchasing, operations,

distribution and logistics are referred to as the 'immediate' supply chain (**Figure 1**). The activities involving 'second-tier' suppliers and consumers are known as the 'extended' supply chain.

With the prevalence of globalization (Braithwaite, 2003, pp. 3-5) as an operational strategy, greater global competition, increasing product variation, rapid rate of product innovation and the shortened time to market, companies have been forced to become more flexible and quicker to adapt in order to survive in such a complex and dynamic environment (Fisher, 1994. pp. 83-85). The large selection of products to choose from and the competitive marketplace benefits consumers and at the same time places great pressure on manufacturers to accurately predict the demand so that production and shipments can be planned accordingly.



(Based on Slack, 2001, p. 414)

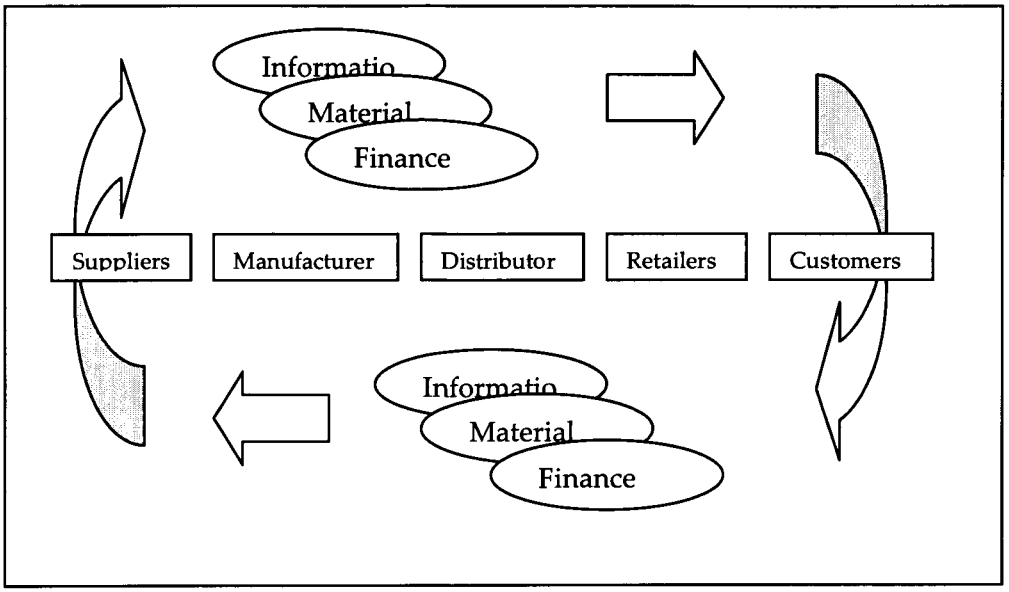
Figure 1 Supply Chain Management Terms

1.1.1 Supply Chain Management

Strategic supply chain management includes the flow from extended suppliers and customers, beyond the immediate channels with which the company directly deals with. Supply chain management is the management of the extended supply chain and the continual management of the interconnections of the channels through which goods and services flow within a company (Slack, 2001, pp. 412-414). The supply chain encompasses both the **supply side** and the **demand side** activities (**Figure 1**). Purchasing and supply management describe interactions between operations and the company's suppliers on the supply side. Physical distribution management along with its extension, logistics, is synonymous with the demand side activities. Materials management is a term used to describe the portion of supply chain management that involves the immediate activities that relate to the interactions of both the first layer supplier and customers.

1.1.2 The Flow

The supply chain was earlier defined as the flow of materials and information between the different functional groups within an organization. However, a third component, finance, merits extra attention (Lee, 2000, p. 32). The supply chain is essentially a flow of materials, information, and financial components in a network made up of suppliers, manufacturers, distributors, retailers, and customers (**Figure 2**). The materials propagated include the *actual goods sold,* in its various stages of processing, and *raw materials* as they make their way to and from *suppliers* through to the *customers.* The reverse flow of materials, an important part of supply chain management, occurs during returns, servicing, maintenance, recycling and disposal. Information transmitted along the chain includes order placement and logistic details. Financial items passed along include credit terms, invoices, and payment schedules (**Table 1**).



(Based on Lee, 2000, p. 32)

Figure 2 Supply Chain Flows

The flow of information cuts across multiple functions and business areas both internally and externally extending through partners, suppliers, and customers. For large multi-national companies, the networks of flows are complex and becoming ever more intricate as companies are starting to vertically disintegrate (Frech, 2003, p. 14) and focus on core competencies while outsourcing non-core competencies. Most global corporations have multiple enterprises located in various parts of the globe tasked with tackling their own unique supply chain challenges. Convoluted relationships where multiple suppliers serve multiple customers, including the competition, are commonplace. There are even instances where the company outsource the intermediary primary supplier activity but still retain some of secondary supplier activity. The complexity of the relationships and linkages has lead to the adoption of the terms "Supply Networks" or "Supply Webs" in reference to the supply chain. The effective management and coordination of the flows across the different companies is critical to efficient supply chain management.

Table 1 Flow Types through Supply Chain

TYPE of FLOW	EXAMPLES
Conventional Flow – Suppliers to Customers	
Information	Capacity, promotional plans, delivery schedules
Material	Raw materials, intermediate products, finished goods
Finance	Credits, consignment, payment terms, invoices
Reverse Flow – Customers to Suppliers	
Information	Sales orders, inventory, quality, promotion plans
Material	Returns, repairs, servicing, recycling, disposal
Finance	Payments, consignment

(Based on Lee, 2000, p. 32)

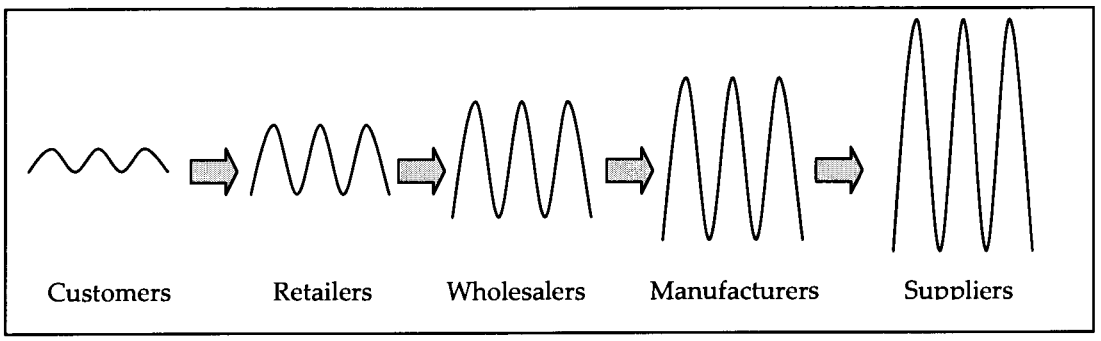
1.1.3 The Challenges

The challenge in coordinating the informational and material flows centers on the propagation along the different nodes in the supply chain. Depending on the degree of vertical integration, the nodes are often disparate third party organizations that do not share standardized information formats. Each party along the chain with their own incentives, pass information (such as demand estimates and delivery schedules) independently. Without proper communication, accurate forecasting is near to impossible placing stresses on the entire chain to accommodate the dynamic demands of today's highly scrutinizing consumers.

1.1.3.1 Bullwhip Effect

A phenomenon arising from the distortion of information along the various nodes of the supply chain is especially problematic for many organizations. Proctor and Gamble (P&G) conducted a survey on their popular infant diaper product, Pampers (Lee 1997, p. 93). The results showed that the fluctuations in sales at the retail channel level was quite moderate while the variability in the orders made by the distribution centers

exhibited a much higher and more pronounce amplification of irregular patterns. The term "Bullwhip Effect" (or "Whiplash Effect" in some industries) is coined to describe this type of behaviour. The result is represented diagrammatically in **Figure 3** illustrating the how moderate changes in buying patterns of consumers get amplified along the supply chain. At the end of the chain, orders are placed to the manufacturers that grossly estimate the orders needed to satisfy the actual demand at the retail level.



(Based on Lee, 2000, p. 33)

Figure 3 Increasing Order Variability up the Supply Chain

Dr. Lee et al have identified four major causes of the bullwhip effect (Lee, 1997, p. 95). These factors (**Table 2**) together with the node-like infrastructure of a supply chain as well as rational order management strategies conspire to create the distortions. Order managers, even while acting rationally, will make decisions that lead to the bullwhip effect. The 'beer game', where players are asked to play the role of customers, retailers, wholesalers and suppliers of a well-known beer brand, illustrates this very well (http://beergame.mit.edu/default.htm). Where communication is limited to the order requests of the upstream player, the downstream ordering patterns exhibit the amplified order numbers of the bullwhip effect. With additional factors brought in, such as potential shortages of raw materials, the ordering patterns will escalate out of control much quicker.

Table 2 Factors that Lead to Bullwhip Effect

FACTORS	CHARACTERISTICS	RATIONALE
Demand forecast updating	Exponential smoothing of downstream demand signals	Build safety stock -Contingency ordering inflates actual demand
Order batching	Accumulation of orders before issuing orders	Decrease transaction costs -Creates artificial periods of high demands coinciding with ordering window
Price Fluctuation	Purchasing at the right price rather than the right time	Decrease cost of goods sold -Purchasing spikes match promotional periods and does not reflect actual demand
Rationing and shortage gaming	Purchases made based on anticipation of shortage	Circumvent vendor rationing to maximize reach all potential customers -Redundant units ordered from 'gaming'

(Based on Lee, 1997, pp. 95-98)

1.1.3.2 Mistrust and Perceptions

In multi-tiered supply chains with independent entities occupying the different nodes of the chain, trust plays an important part in the effective management of the entire chain. Each of the members has their own self-interest in mind when making supply chain decisions. For instance, the manufacturer would want to limit supply so that they can create an artificially high demand and price at high margins. At the same time, retailers would want to capitalize on the market potential and order enough to satisfy the entire demand which coincidentally will counter the interest of their supply chain partner to control supply and manipulate the market's willingness to pay. In most supply chains, occupants of the different nodes do not share common goals and in fact

are at odds with one another (Disney 2003, pp. 200-201). The result is that order decisions, supplier contracts, and other service agreements between the different parties are often drafted up without the strategic view of the global supply chain in mind.

The breadth of the supply chain makes it vulnerable to a large number of variables that could potentially affect it. The result is a complex and uncertain system that breeds chaos leading to over-reactions, mistrust, over management, and incorrect information passed along the chain as each member of the chain tries to interpret the signals from their immediate partners. Dr. W. Edwards Deming, a renowned Process Quality expert, termed the chaos as 'nervousness', warning that if not managed properly it will lead to higher operating costs and inefficiencies because of over ordering and the overuse of inventory as a buffering strategy (Christopher, 2001, p. 2).

1.1.3.3 Financial and Market Risk

The financial risk in supply chain management is the large amount of cash that is tied up in inventory. The inventory has exposure to risk of obsolescence and depreciation, theft, damage, and penalties for late or non-delivery. It is estimated that personal computers devalue at a rate of more than 1% per week (Christopher, 2001, p.5) translating to huge inventory costs due to depreciation. Supply chains that are not effectively managed lock up cash creating high opportunity costs as well as exposing that cash to very high financial risk, especially in goods with short shelf lives.

Today's highly discriminating and dynamic market rewards flexibility and being proactive rather than reactive to meet market demands. If the market signals are not interpreted properly and promptly enough, current customer preferences and market trends will not be met. Missed market opportunities could result in millions of dollars of missed revenue opportunities. In addition, misinterpretation of the market signals will lead to over ordering of stock that in the worst-case scenario would need to be written-off due to lack of demand.

1.2 Value Proposition

Using Porter's value chain model of competition (Porter, 1985, p. 151), a company either competes with a product offering that is **low-cost** or **differentiated**. Irrespective of the approach, the economic "rents" that is recovered is maximized through the lowering of operational costs. As a result, a well-managed supply chain that reduces costs will produce higher profit margins exhibiting an internal benefit.

1.2.1 Tangible

Effectively managing the supply chain can bring about value to the company by minimizing the total duration of time that inventory is tied up. The longer that inventory stays within the company's value chain means that cash that could otherwise be used for growth, investments, debt payment, or liquidity is tied up for longer periods. In addition, inventory processing has associated costs of occupying distribution space and labour resources needed to manage and maintain the inventory. For products reliant on fashion trends, the willingness of customers to pay depreciates with failure to meet targeted seasons and/or sales windows (Fisher 1994). The typical markdown of items that are out of season, 'closeout' products are on average 40% less than the original retail price, and can be as high as 60% (Levison, 2002). Closeout styles also have implicit opportunity costs as resources are committed to maintaining them and cannot be utilized for current season and higher margin products.

The reverse of over-stock is the potentially even more costly problem of stock-outs. When customers are unable to make a purchase because the product is unavailable, the damage may be more far reaching than just lost sales opportunity. The negative purchasing experience may drive customers to the competition to fulfill their current and future needs. For fashion-related products, pushing the products out to market first would serve as a potential 'first-movers advantage' where initial momentum of the product dispersal will induce the majority to follow the growing trend. Many retailers such as Wal-Mart also have punitive service agreements in place where prohibitive fine are levied for failure to deliver as per the contract details.

1.2.2 Intangible

Poor supply chain performance with respect to the inability to deliver specified goods on the requested date could lead to learned behaviour detrimental to the effective coordination of the supply chain. Retailers that repeatedly experience receiving deliveries past the request date or at insufficient quantities will provide exaggerated order quantities and aggressive order dates in anticipation of delays and shortages. If the order is correctly fulfilled, the manufacturer is left to either hold the goods until the retailers are ready for the order or cancel the excess ordered out of contingency.

Customer satisfaction is a big component of effective supply chain management. Beyond stocking the shelves of the retail stores with the right product at the specified time, streamlining the supply chain could reduce transaction costs. According to the senior vice president of IBM's Integrated Supply Chain, Robert Moffat, improving customer satisfaction "one point better than the competition" translates to an extra $2 billion to $3 billion increase in annual revenues (Demarzo, 2003, p. 57). Satisfied customers usually will be returning customers while a poor customer experience can often drive away existing customers to the competition.

1.3 Scope & Methodology

The scope of the report is limited to an analysis of the coordination of supply chain activity of a Sporting Goods OEM (Original Equipment Manufacturer) within Canada. The company, a legal Canadian entity, upon which the analysis is based upon, has requested to remain anonymous. Fearing competitive information escaping to the public realm, the analysis will be primarily qualitative with financial and operational numbers excluded. However, the processes and company background are an accurate representation and based on research conducted within the company as well as the numerous literature articles that have written about this well-known sporting goods manufacturer.

The focus is the demand planning side of supply chain management. The supply chain process within the Canadian entity is documented using IDEF0 convention where

inputs, outputs, controls, and resources are described in a flowchart format. The process diagrams provide the framework for identifying issues with the firm's supply chain process. Alternatives for addressing these supply chain issues will be evaluated against one another and the status quo using the Balanced Scorecard tool (Kaplan, 1992, pp. 72-79) to arrive at a final recommendation.

The scope of the paper will also focus on apparel and footwear specifically since the two distinct categories are where the major sporting goods manufacturers have traditionally focused their efforts. Recent forays into the equipment market segments have been met with varying degrees of success, but that is outside the scope of this paper. However, it should be noted that many of the same principles pertaining to supply chain management would still apply.

2 COMPANY BACKGROUND

The company evaluated is a regional subsidiary of a large global sporting goods manufacturing organization. The company is one of the major players in the international sporting goods market with operations in every part of the world. Respecting the wish for confidentiality, the global corporation will be referred to as "Company A" while the Canadian operation; the subject of the paper will be referred to as "Company A Canada" or (A CAN).

2.1 Industry

The sporting goods market is a vast market that spans both athletic goods as well as lifestyle fashion. In Canada, a handful of companies carry the bulk of the market share through the power of their brand and the revered place in popular culture that sports and the pursuit of physical health occupies. The immense popularity of sports in general lends itself to the vast market potential. It is an industry that offers the opportunity for high profit margins but the profitable segment is reliant on brand strength which requires economies of scale and size to penetrate. The industry usually focuses heavily on R&D, marketing, distribution, and merchandising where the actual manufacturing is outsourced to third party factories.

The publication *Sporting Goods Business* classifies the sporting goods industry into the distinct categories of branded apparel, athletic footwear, outdoor footwear, lifestyle footwear, and equipment. In terms of revenues, athletic footwear, branded apparel and equipment sales are the three highest. The largest sporting goods manufacturers have traditionally focused on footwear and apparel; however, a major consolidation process has begun in the industry (Lau, 2004). Companies such as Nike and Adidas are beginning to look for other revenue sources in the maturing market. Nike has recently acquired shoe manufacturer Converse, hockey equipment manufacturer Bauer, and the branded children apparel manufacturer Hurley. Adidas has answered by acquiring golf equipment manufacturer Taylor Made, branded apparel

manufacturer Arcteryx and equipment manufacturer Salomon. Reebok has also participated in the market consolidation trend through the acquisitions of equipment manufacture The Hockey Company. As the industry matures, the market will further consolidate as the big players try to increase revenue from a market that may be beginning to hit its growth plateau by expanding into market segments within the sporting goods industry they previously ignored.

2.1.1 The Market

There are no major sporting goods manufacturers that sell directly to the end customers. Their immediate customers are retail channels such as traditional departmental stores (e.g. Sears), brand name athletic sporting goods retailers (e.g. Footlocker), category-specific specialized sporting goods retailers (e.g. The Running Room), and occasionally through high volume brand name liquidators (e.g. Winners). The Canadian market for sporting goods is very similar to the US with respect to the type of sporting activity preferences. The most notable difference is the size discrepancies between the two counties, where the population of Canada (31 million, http://www.statcan.ca/english/Pgdb/demo02.htm) is about 10% that of the neighbouring US (294 million, http://www.census.gov/main/www/popclock.html). Regardless, the two markets are very similar in terms of preferences and characteristics; therefore, many references will be made to US market numbers to provide an idea of the size of the market and the distributions of the various categories of sporting goods.

Table 3 Athletic Footwear Market Share in North America

COMPANY	FW MARKET SHARE	TOTAL REVENUE ($millions USD)	
		FY03	FY04
Nike	39%	3,005	3,052
Reebok	14%	1,036	932
New Balance	12%	910	910
Adidas	8%	750	810

(Based on SGB, 2004, p. 18 & Koch, 2004)

Athletic footwear market is by far the largest of the segments within the sporting goods industry. The total global market size for athletic footwear alone, excluding equipment and apparel, is estimated at US$40 Billion (Koch, 2004). There are only a handful of truly dominant companies in this market with a group of specialized niche manufacturers and low-cost manufacturers dividing the rest of the remaining market share. Nike dominates the global footwear market with a 32% share followed at a distant second 17% share belonging to Adidas. The distribution is much the same in North America with Nike, the leader, by far the dominant player in the athletic footwear market (**Table 3**). However, Adidas drops behind two other companies as a distant follower where the tremendous popularity of basketball and running in North America elevates the performance of Reebok and New Balance respectively. Recently, Nike is starting to lose its grip on the North American athletic footwear market especially the lucrative US$2.5 billion basketball shoe market to Adidas and Reebok. Nike's once impressive stable of sponsored professional basketball players have either retired or defected and the lack of exposure has hurt their dominance (Holmes, 2003).

Table 4 Branded Apparel Revenues in North America

COMPANY	Associated BRANDS	TOTAL REVENUE ($millions USD)	
		FY03	FY04
Nike	Hurley, Cole Haan	1,398	1,269
Sara Lee Corp	Champion, JogBra	1,088	1,098
Russell Corp	Bike, Wal-Mart	1,085	1,076
VF Corp	North Face	737	667
Reebok Inc	The Hockey Co.	561	461
Columbia	Columbia	519	495

(Based on SGB, 2004, p. 18)

More parity can be found in the other market segments within the sporting goods industry. In North America, Nike still enjoys the market lead in the branded

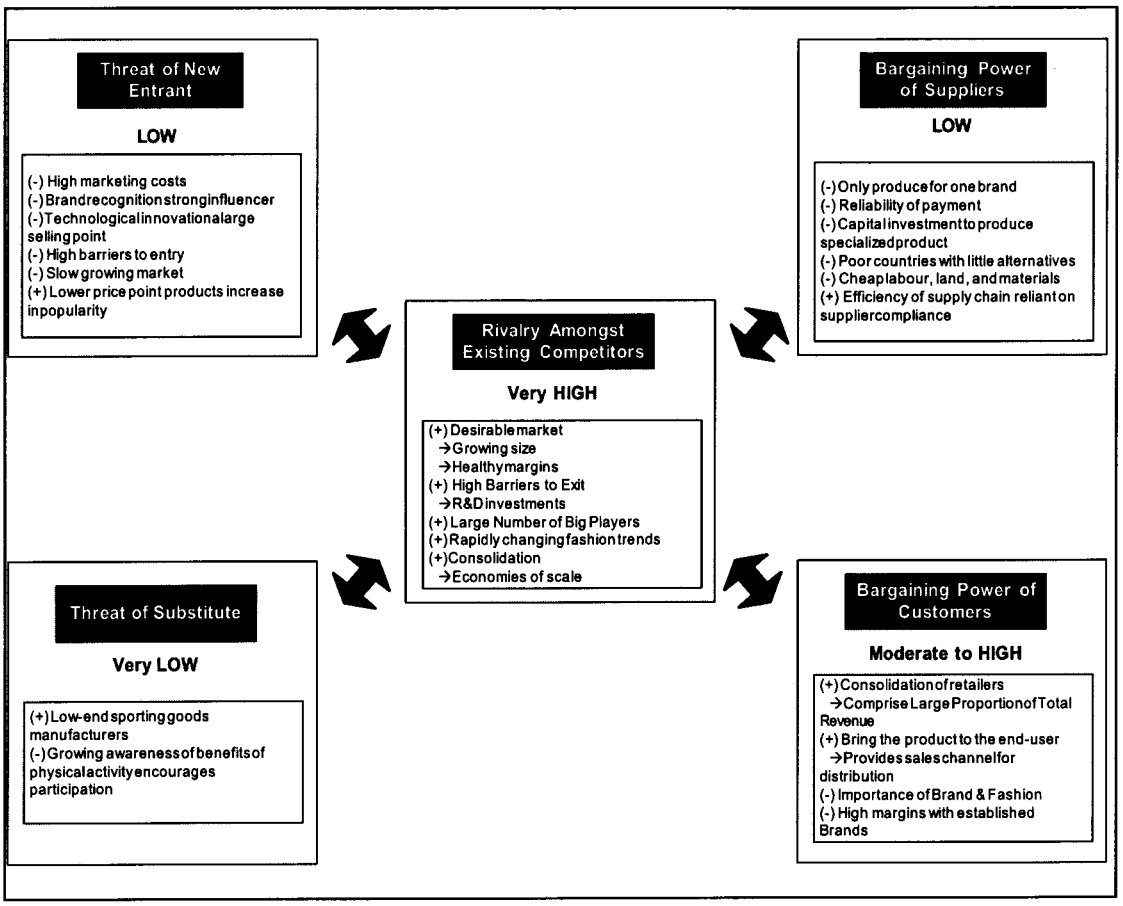
apparel market but commands only a 30% gap of revenue between them and their next closest rival. The branded apparel segment is perhaps the most fragmented since many fashion-oriented manufacturers (e.g. Gap, Roots, and Tommy Hilfiger) also are active and are powerful players in this space. Aside from Nike and Reebok, the other leading branded apparel manufacturers specialize in clothing and do not have a significant presence in any other sporting goods market segments.

2.2 Five Forces

The Five Forces model is a good tool for describing an industry based on how attractive it is to enter (Porter, 1979, p. 142). It hinges on analyzing the five currents, the **Threat of New Entrants, Bargaining Power of Suppliers, Rivalry Amongst Existing Competitors, Bargaining Power of Customers,** and **Threat of Substitutes,** that companies competing in any given industry must contend with. The strength of the forces will determine the profit potential of an industry. Section 2.2 analyzes the impact of the impact, summarized in **Figure 4,** of these five forces on the Canadian sporting goods manufacturing industry.

2.2.1.1 Threat of New Entrant

The threat of new entrants into the traditional specialty sporting goods manufacturing industry is very low. The large profit margin for companies such as "Company A" are with high-end specialty apparel, equipment and footwear requiring large sums of upfront capital investments in marketing, research and development and brand development. The high barriers of entry and the tremendous brand appeal of the incumbents make entering it very difficult.



(Based on Porter, 1979, p. 142)

Figure 4 Five Forces Diagram of Canadian Sporting Goods Industry

New entrants, however, are able to erode small amounts of market share from the oligopoly in the footwear market segment if they target specific 'beach head' niches. The biggest threats come from two fronts, low-end manufacturers and target-market specific manufacturers. The low-end manufactures compete based on pricing typified by low margins and high volumes. Most of the major manufacturers are more than willing to concede the low price point consumers and in fact encourage it by discriminating the channels that carry their product to ones that carry only 'brand-name' items so as to not dilute the value of the brand. The lower quality and much more affordable goods are not a threat now, but in the future, the market may show a preference for price over quality and brand. When price becomes a more important motivation to the consumers compared to quality and brand image, companies such as

Starter, Spalding, and Rawlings that supply large discount channels such as Wal-Mart may take a bigger market share encouraging other low-cost manufacturers to enter the market (Ryan, 2004, p. 28). The niche competitors are the ones that are eroding the valuable high margin specialty athletic footwear segment the incumbents do not wish to relinquish. They appeal to the consumers that spurn the brand-conscious popular culture of today's society. New Balance is a company that owns a large share of the entire athletic footwear market while offering only a small line of products consisting of primarily high-priced running shoes. They effectively promote themselves as the brand that is "Endorsed by No One" (McCarthy, 2003).

During the 1990's, the "brown shoe" craze in casual footwear lead to a shrinkage in the athletic footwear market. Recent growth is a reflection of the recovery of the lost sales to casual footwear sales (Holmes, 2002, p. 129). The North American footwear market appears to have hit a plateau as consumers are more discriminating in the frequency with which they purchase and the price points at which they are willing pay.

Overall, the threat of a new entrant is not very large considering the importance of brand development in the sporting goods industry. However, market preferences do evolve and there are vulnerable points within the sporting goods manufacturing industry that will attract new entrants to try and take away shares of the profitable market from the incumbents. With a market that appears to have reached a ceiling, the growth potential is limited. The threats of new entrants eroding the core market share are low.

2.2.1.2 Bargaining Power of Suppliers

"Company A" Canada does not manufacture any of the goods it sells. In fact, most of the goods are manufactured outside of the country in low-cost third world countries. The exception is apparel that is made specifically for the Canadian market. Domestic Canadian factories manufacture this 'localized' apparel. The remainder of the product line is manufactured in developing countries, a common practice not only in the sporting goods industry but also in the entire clothing industry as a whole. Companies

in other industries, such as electronic equipment manufacturers, also leverage the cost advantages of developing countries to increase their margins.

Most sporting goods company have no or very little affiliations with their suppliers. They often further distance themselves by employing a third party agency to assist in the communications with the factories. These third party agencies are responsible for finding suitable plants to meet the manufacturing requirements of a certain product line. The original equipment manufacturers (OEM) will pay the third party agencies that will in turn reimburse the factories. The third agencies provide valuable insight to the local culture as well as credit buffer assisting with cash flow.

More recently, consumers have become more vocal in the labour practices that the suppliers employ. In the 1990's many companies including Adidas, Nike and Reebok found themselves the center of backlash against unfair labour practices in the factories that manufacture their products (Bernstein, 2003). Those companies have since imposed strict guidelines on the conditions of the factories, total hours a given worker can contribute, higher minimum wage levels, and minimum age requirements for hiring (Holmes, 2003). In spite of the proactive role that the OEMs are taking with respect to supplier selection, actual change has been slow. It is estimated that only 5% of the total factories are monitored (Bernstein, 2003) and is managed by 'for-profit' auditing firms that conduct surveys on-site where the interviewees may be intimidated, intentionally so or not, from making complete disclosures.

There is however evidence that the new strict regulations have done more damage to the workers that they were meant to protect. It is estimated that the average salary paid by US multinational corporations are typically 100% greater than the average salary in low-income countries (Bailey, 2004, p. 12). Factory workers that produce foreign-owned apparel and footwear brands rank in the top 20th percentile in terms of income. Nike subcontractors in Indonesia pay their workers six times the average minimum wage. After the backlash and subsequent responses to poor labour practices, many of the factories in developing countries were forced to close when companies such as Nike withdrew their business. China, with a large source of cheap labour and limited

media access, has become the preferred alternative (Balfour, 2003). The loss of factory jobs in these developing countries to China have hurt their economy and in some cases have lowered the working conditions as the remaining factories now produce for non-compliant low costs manufacturers.

The factories have very little bargaining power in this industry. In many cases, the multinational OEMs are the only client they have and once their business is lost, the plants are forced to close. The emergence of China as a formidable source of competition that is free from labour practice scrutiny places more pressures on the factories. The factories must price competitively but at the same time adhere to strict labour practice standards dictated by image-conscious OEMs.

2.2.1.3 Threat of Substitutes

Participation in sports and the cult-like following that professional sports holds on society will perpetually keep the demand for sporting goods. The idolatry of professional athletes has helped establish high price points for high performance sporting goods. The biggest threat to the sporting goods industry is the consumer's willingness to pay premium pricing for features on products. Features that offer performance advantages designed specifically for athletes participating at a high level of competition, a level which the majority of the consumers do not attain. If the market dictates that price is more important than brand and features, then a "vanilla" pair of shoes or generic set of track suit would be a viable substitute to the branded products which hold the majority of the market share in North America.

The "brown shoe" (Ryan, 2003, p. F28) fad of the in the late 1990's also presented a formidable challenge to the athletic shoe industry. However, the popularity of casual wear is starting to lose momentum and athletic wear is regaining a lot of their lost market share. Even in the face of new trends, most of the large sporting goods manufacturers still can actively mine these markets due to their broad product offerings. Yoga is a good example, a physical activity growing in popularity recently. The participants do not wear footwear; nonetheless, companies such as Nike are still able to

target this segment by offering a complete line of yoga apparel as well as yoga equipment such as mats and travel kits.

The threat of a substitute is very low. Today's society is increasingly aware of the dangers associated with inactivity and there is a concerted effort on the part of government and community leaders alike to promote the benefits of physical activity. The popularity of sports does not seem to be declining anytime soon. As a result, the associated sporting goods will enjoy the same continual acceptance.

2.2.1.4 Bargaining Power of Customers

The direct customers for sporting goods manufacturers are retail stores, as most manufacturers do not integrate into retail channels. The sporting goods retail landscape can be categorized into four distinct groups: **brand-name department stores, big-box sporting goods chains, specialty retailers,** and **brand name high volume clearance retailers**. The target customers are the big-box sporting good chains such as Foot Locker and Forzani Group Ltd. (SportsCheck).

The big-box stores represent, by a large margin, the biggest share of the sales for "Company A" in Canada. They not only buy the most number of units, but they also carry the full line of products, including the most expensive products with the highest profit margins. Their large sales volumes have given these accounts a greater advantage than the other type of stores. Big-box retailers such as Foot Locker have recently been attempting to exercise their implicit bargaining strength by challenging manufacturers such as Nike through the reduction of its inventory of "marquee", priced US$100 and over, shoes (McCarthy, 2003). The struggle has led to Foot Locker using previously Nike-reserved display spaces for the competition such as Reebok and Adidas. In response, Nike has shifted an estimated US$500 million of new promotions and styles from Foot Locker to other channels such as The Sports Authority.

The department stores such as Sears and The Bay usually carry products with lower price points; however, they order in sufficient quantities to command significant bargaining power as well. They have specific requests such as EDI-based (electronic

data interchange) communication for orders and payments as well as VAS (value added services) for most of their orders. "Company A" uses brand name high volume clearance centers such as Winners to clear out overstock items or liquidate 'past season' stock. Winners, although a clearance center, carry only brand names thus reducing the risk of brand name dilution. "Company A" also owns several Factory Outlets that are used as a channel to release off-season stock to the public. These outlets are usually located away from major city centers and only in one province to avoid lowering the pricing power of the brand. Finally, there are specialty retailers that carry only a specific category of product line. The Running Room, for example, carries only the running product line for Company A. The specialty retailers provide access to the enthusiasts who are the least price sensitive and favour quality and customer service above pricing. Although the volumes are not very high, the profit margins on the products sold are very favourable through this channel.

The bargaining power of the customers is moderate to high. The big-box retailers with the large volume of sales they represent are able to dictate many additional provisions often not afforded to other the other categories of retailers. However, brand power and the associated ability to set high price points returns a lot of bargaining power to the manufacturers as well. Without the brand name manufacturers, the big-box retailers would suffer, as they would not be able to compete on price with low-end retailers such as Wal-Mart. Both the customers and the company possess strong bargaining positions, but retailers have the slight edge due to the importance of customer satisfaction and how it is engrained into the corporate culture of "Company A". In most cases, "Company A" does not take advantage of the power of their brand and be more aggressive with respect to dictating the details of customer agreements.

2.2.1.5 Rivalry amongst Existing Competitors

The rivalry amongst existing competitors is very high. There are several major players in the market, namely Nike, Adidas, and Reebok. There are high exit barriers

since all these companies have already invested significant capital in developing their brand, the image, the technologies and the infrastructure to compete in this market. The market is also very profitable with high margins and showing signs recently of growing once again, although at a very modest rate. Combined with ever-changing customer preferences, the incumbents compete fiercely to capitalize on new trends or sway buying patterns.

There is also competition amongst existing competitors for expansion into other market verticals. Traditional sporting goods manufacturers that specialized in apparel and footwear are starting to venture into other segments such as equipment. The high amount of competition and the big role of advertising make the sporting goods industry highly competitive.

2.2.2 Summary of Five Forces Analysis

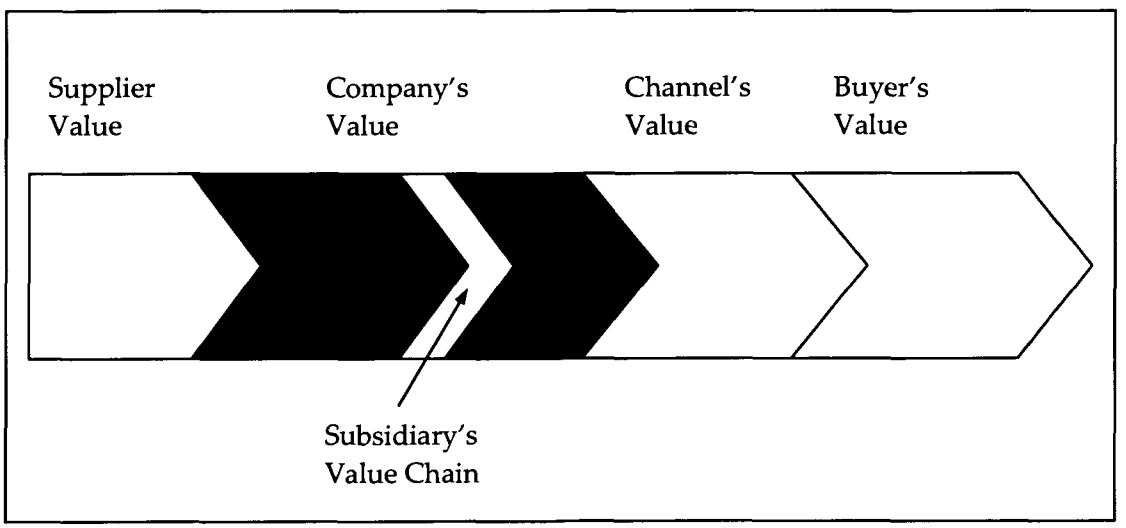
The external analysis shows that the industry is highly competitive and the customers, both the retail channels as well as the end consumers, have strong bargaining power. The environment requires distinct competitive advantage to be successful in the midst of such strong competitors. For companies that wish to be the leaders in such a highly contested market, an optimal supply chain is a valid source of competitive advantage over the competition. The bargaining power of customers means that customer satisfaction will be an important metric when evaluating strategic alternatives. All changes proposed should consider any negative impact to the customers. The analysis also identifies that although suppliers themselves do not possess real bargaining power, their operational practices, through association, do present public relational risks. As a result, proposed alternatives should try to include suppliers.

2.3 Value Chain

The value chain is a series of independent activities within an organization that are connected by linkages (Porter, 1985, p. 150). These connections imply that changes to one activity will affect others within the system. Managing the linkages often

involves trade-offs where the optimization of one activity is at the expense of another. The effective management of these linkages can be a great source of competitive advantage for companies. The value chain is a model that allows for the analysis of the operational activities that an organization engages in. The supply chain is a subset of activities within an organization's value chain.

The value chain of a company is part of a larger series of activities that is referred to as the value system. The value system includes the value chains for the suppliers that are responsible for the inputs as well as the channels used to reach the end consumers whose buying activities mark the end of the value system. Competitive advantages can be realized through optimization of the activities within and outside the company's value chain. Competitive advantages through either differentiation or low costs are a result of the activities in the value chain. The careful management of the cost of each activity will translate to the ability to set low pricing and yet still profit. The value chain activities will also contribute to the ability of an organization to satisfy the needs of the customer. The trade-off choices will result from the competitive route chose by the company. The value chain (**Figure 6**) highlights all the activities that will add value to the company in the goal of increasing margins.



(Based on Porter, 1985, p. 151)

Figure 5 Value System Diagram

2.3.1 Primary Activities

The primary activities are the core activities that are crucial to providing value to the company and are comprised of marketing, inbound logistics, operations, outbound logistics, and services. The Canadian subsidiary of "Company A" operates their primary activities quite autonomously of the influence from the headquarters. The degree of independence will vary for the different activities but for the most part, the regional subsidiaries are allowed to run their primary activities in a manner they deem best.

2.3.1.1 Marketing and Sales

The marketing and sales activities for "Company A" Canada include managing the sales accounts to maintain and further development customer relationships. There is also market development activity such as building brand awareness, mining new business opportunities, and creating market demand for new products. Merchandising services are also offered to ensure that the appropriate product mix is offered in the country. The marketing department works with negotiating endorsement agreements for local athletes to help raise awareness for the brand and the products. However, headquarters manages the relationships with high profile celebrities. Marketing and sales also play an important role in the demand planning process where their input is used to create a forecast of demand for coming seasons. Based on their interpretation of the market signals, orders will be placed for the production of products well ahead of the launch date.

2.3.1.2 Inbound Logistics

Since the head office coordinates all overseas transportation arrangements, this part of the value chain is not a vital part of the operations. Even third party logistic companies are negotiated by head quarters to leverage economies of scale savings as well as consolidate the information dissemination needed for coordination. The value

activity for inbound logistics revolves around advanced planning of incoming shipments. The logistics team will plan the receiving schedule of the distribution center (DC) weeks before the expected arrivals of goods. The planning takes into consideration the capacity of the warehouse, the expected sales targets, customer delivery dates, and campaign priorities. The result is pre-assigned location areas where a given style is to be stored once it is docked at the company's receiving doors. The bin locations are based on the size of the packaging as well, as how quickly the product will be needed for processing and eventual shipment to customers.

They also have the ability to allocate inventory that are still on transit in a freight ship from overseas suppliers. This early allocation reduces the total inventory time within the supply chain as shipments arrive to the DC already pre-allocated and spend minimal time in storage. Early allocation allows much earlier visibility on inventory positions so that certain styles on transit are not ordered twice resulting in overstock.

2.3.1.3 Operations

Receiving includes unloading goods from the container into the warehouse and the storage of the goods until the customer delivery date. In the majority of the cases, the product arrives in bulk quantities that require processing prior to shipment. Pick and pack activity is where the quantities of a given order are selected (or picked) and then packaged for shipment to the customers. Some customers also requests valued added services such as ticketing, a service that "Company A" offers. The shipping team is responsible for loading containers with packaged goods for transport to the channels.

A quality services team will conduct random quality checks on the product as a means of ensuring quality of the product as well as integrity of the inventory numbers. In addition to inventory accuracy, spot checks are indicators of the confidence that a given product is in the location specified by the system. It provides insight into both the reliability of the systems as well as the resources that are responsible for maintaining the bin contents.

The sales team is responsible for mining business; however, order managers are the ones who capture the order information. Based on stock availability, they generate the orders that are fulfilled by the warehouse team. Order managers work with and are associated closely with customer service representatives that field inquiries about order status, returns, client concerns, and any other customer-related issues.

2.3.1.4 Outbound Logistics

As with inbound logistics, the outbound part of the value chain is not an important part of the value chain for the Canadian operations. However, the shipping team needs to coordinate the shipping schedule to meet the delivery demands resulting from customer orders. There is also the issue of reverse logistics where product is returned for either customer related or product related issues. Outbound logistics will be responsible for scheduling the return pick-ups, processing defectives, as well as coordinating the non-defective stock back into the inventory system for re-allocation.

2.3.1.5 Services

A 24/7 hotline is available for technical support so that the employees will always have a resource to contact in case of issues related to hardware or software. The large geographic diversity of Canada spanning more than 3 time zones coupled with the interactions between the Canadian organization and other regions provides a lot of value for the 24 hour support. Customer service representatives also receive calls from end consumers providing an ear for them to voice their concerns or provide their feedback whether positive or negative. Bilingual options allow the French-speaking consumers to use this service as well

2.3.2 Secondary Activities

The secondary activities provide support to and enable the value primary activities to be accomplished. The critical support activities are not provided within the subsidiary value chain. General management, planning and direction, systems, infrastructure and even global purchasing from suppliers are handled by head office. The subsidiary has input in some the various activities but the final decision is left to the head office.

2.3.2.1 Firm Infrastructure

"Company A" Canada is a legal entity; therefore, they have their own accounting department. They use a third party credit agency to help them pay their offshore suppliers. Domestic suppliers are paid directly. There is a credit department that fills the accounts receivable role within the accounting department. The department is also responsible for filing taxes, processing credits from returns as well as preparation of financial reporting to pass to the head office.

There is also a regional IT presence that supports the hardware and critical business systems. The "Infrastructure Systems" team is primarily responsible for supporting the hardware systems as well as standard suite of basic software used by all parties. The "Business Consultancy" group is responsible for supporting the core business applications and themselves supported from head offices as all global systems are maintained by head quarters. The 'support' oriented model allows for tight control over the settings and configuration of the technologies at Company A. All computers are built the same way using a standard 'image' on a line of identical systems. Localization of IT occurs when the business consultancy group create Canadian-specific reports unique to the business conditions within Canada.

2.3.2.2 *Human Resource Management*

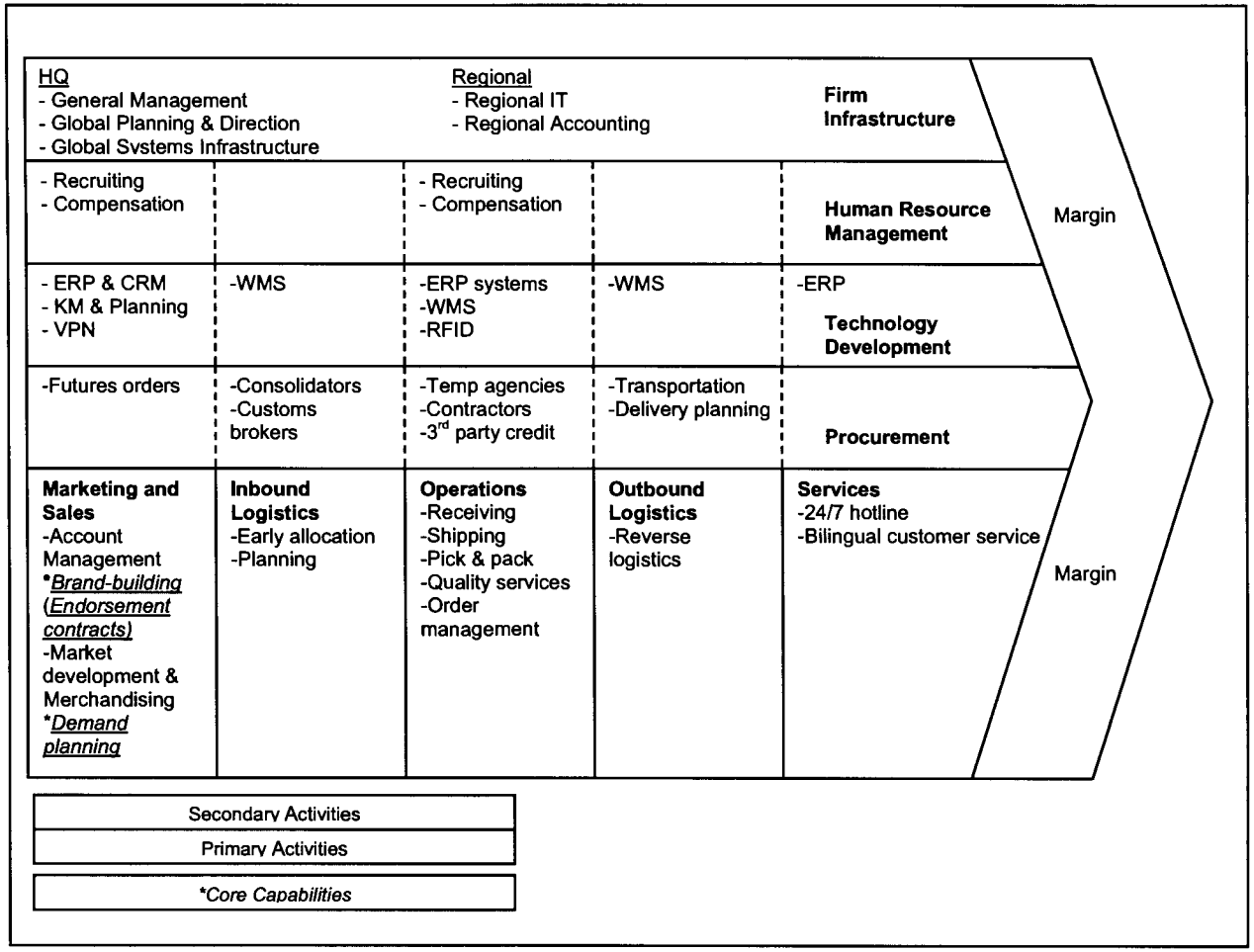
The HR department do participate in some recruiting activity. They use recruiting agencies to find more specific skill sets. The HR team organizes events targeted for team building, and looks after employee benefits. They also develop training guides for new hires, and maintain employee contract and salary details. HR also coordinates the review process whereby employee performance is evaluated and is active in the subsequent reward or discipline process as well. They are also the place where employees can voice their concerns, either professional or personal in nature.

2.3.2.3 *Technology Development*

"Company A" leverages technology heavily for their operations. The SAP Enterprise Resource Planning (ERP) system provides the backbone on top of which the business is run. The system generates invoices, issues purchase orders (PO) to suppliers, tracks and allocates inventory to orders. Connectivity with other enterprise systems allows SAP to hold the inventory information of the entire global entity. The Customer Relationship Management (CRM) tool integrates sales orders directly into SAP through synchronizations that give a relatively current visibility on sales. A customized Warehouse Management System (WMS) supports the distribution activities that are unique to "Company A" and though 'real-time' synchronization with SAP, the WMS also provides the global corporation with current information regarding inventory numbers. Radio frequency identification (RFID) is used to reduce human errors in entering incoming and outgoing stock from the Canadian distribution. It also provides extra value to the customers with the ability to know the contents of a packed carton without opening it.

Many users in Canada have dial-up high-speed VPN (Virtual Privacy Network) connections that allow them to work remotely. The mobility enables key positions to access their work environment and offer more flexible business hour coverage to the business. It is also a great way to ensure the security of the systems network because of

the dedicated dial-up VPN arrangements is not vulnerable to snooping as compared to a public broadband cable access.



(Based on Porter, 1985, p. 151)

Figure 6 Value Chain of "Company A" in Canada

2.3.2.4 *Procurement*

Activities involving the management of third party partners fall under procurement. "Company A" utilizes a third party credit company to pay their overseas suppliers, outsourcing an activity that requires a lot of administration to specialist who are familiar with the role as well as the nuances of the regions. Consolidators are also used to group finished goods from different factories together so that shipping freight costs can be minimized by reducing the number of voyages needed to bring in ordered products. Company A also sets up local presence at the various factory locales to monitor vital information such as resource constraint, technology capabilities, and any other factors possibly affecting productivity of the suppliers. Such information allows Company A to operate with a "Futures" ordering model where they order the manufacturing of product up to two seasons (or half a year) prior to the launch date. Accuracy of the demand is also crucial as "Company A" plans the schedule for their third party logistics partners ahead of the actual customer delivery date.

In keeping with a lean operational model, "Company A" staff the majority of their unskilled positions through "Temporary" agencies. The seasonal fluctuations as well as volatile consumer market favour a workforce size that is adaptable to changing requirements.

2.3.3 Core Capabilities

Within the value chain of "Company A", there are a several key activities that are the source of their competitive advantage. The core capabilities for the firm all fall under the marketing and sales activities. "Company A" has made large investments in the planning tools to support a future orders model where products are ordered from the factories based on the forecasts generated by demand planners. Ordering in advance of the season reduces the time goods spend in the supply chain; therefore, reducing costs and increasing profitability.

The strongest core capability is their brand building activity. Through the endorsements of high profile professional athletes and celebrities, the brand power of their products allows "Company A" to differentiate their product from a competitor and price at much higher price points. The high profile of the brand also creates forgiveness in the market where the brand will sell product that otherwise would be considered mediocre, keep customers from returning in spite of poor delivery records, and other mistakes that would normally not be tolerated were it not for the ability of the brand to sell the product.

2.3.4 Summary of Value Chain Analysis

The internal analysis attests that "Company A" has an impressive collection of technological systems in place implemented with the intent of maximizing supply chain management efficiency. The corporate headquarters have also controlled the configuration of and retained ownership of all enterprise systems to ensure standardized information formats. Both the technologies and the infrastructure are in place to manage a global supply chain that stretches the entire globe. However, the core capability of the firm is sales and marketing. The focus of both resources trade-off analysis will always favour sales and marketing rather than operations. The various local subsidiaries will have their own challenges unique to their particular country. Standard 'global' practices and controls will be sacrificed in favour of value activities that will increase the brand equity and improve sales.

2.4 Corporate Goals

"Company A" has released four key corporate goals for the entire organization to strive towards. The goals provide a good insight into which activities within the value chain that they place the greatest value in. The goals (**Table 4**) provide the different regions as well as the business units within a particular region the framework with which to set the mid-level goals for management. The middle managers can then in turn use it as a guideline to set the goals of the entire workforce. The goals are

released on a yearly basis and are incorporated into performance review process for all employees.

The interpretation of the goals announced across the organization and to the public as well that Company A will compete on a differentiation strategy. The focus will be create value for the customers through relationship building, offering quality products, expanding company verticals to provide a larger range of services and goods, and optimizing supply chain activities to better serve customer's needs.

Table 5 Corporate Goals of "Company A"

"Company A" Corporate Goals
Offer the BEST product in the market
Turn the supply chain into a source of competitive advantage
Further develop the relationship with customers
Leverage the growth potential and explore new opportunities

2.5 Strategy

2.5.1 Invest in technology

"Company A" has invested heavily in technologies to help improve efficiencies in their operations. They boast an impressive array of enterprise systems that serve various parts of the business but are integrated to bring visibility across the silos within the organization. Ever since the implementation of SAP roughly 5 years ago, "Company A" Canada have taken part in either minor enhancements or implemented a major system at least once a year. These planned annual releases have been adopted as a regular part of business function. It is evangelised by senior management and has the full support of all the business units.

Table 6 Summary of Systems in "Company A"

Tools	Description
WMS	Warehouse management system that supports distribution activities. →Example: receiving, picking, shipping, and bin allocation.
SAP	ERP where all the enterprise systems link into providing 'real-time' →Example: global inventory, invoicing, PO's and financial analysis
i2	Planning software for forecasting demand to support "Future Ordering" →Example: demand plan for footwear, equipment and apparel
Seibel	CRM tool used primarily for customer contact and some order information →Example: Orders for smaller boutique shops
E-commerce site	Web portal allowing customers to place their orders →Example: Orders, credit card payments, and credits
PeopleSoft	Enterprise HR software →Example: Employee personal information, benefits and skills

2.5.2 Increase Product Portfolio

Similar to their competitors, "Company A" have been trying to consolidate the industry by acquiring brand names in the sporting goods industry. They are leveraging their economies of scale and proven track record in marketing to increase market share as well as expand product offering to customers. The consolidation patterns of all the major players also seem to be motivated by the intention of pre-emptively making acquisitions before a rival does.

2.5.3 Re-focus on Core Competencies.

The company is also dedicating its resources to refocus on its core competencies. Market segments that are traditionally the strength of the company have had market share eroded by the competition. The appeal of the product lines has shifted recently

from the traditional sports enthusiasts to mainstream fashion and casual participant. The dedicated sports enthusiasts do not contribute to a large share of the revenue; however, their use provides credibility to the product and the brand.

2.6 Organizational Structure

2.6.1 Reporting Structure

Company A categorizes their markets into geographic regions for the purposes of reporting as well as a middle-tier general management level to provide intermediary direction to the individual countries. The geographic regions are USA, Americas, Europe, Middle East and Africa (EMEA), and Asia Pacific. The Canadian company falls under the Americas region grouped together with Latin American countries. This reporting structure is a source of potential conflicts as the Canadian market shares more in common with USA than with Brazil per se. The language differences, difference in market geography and even the level of sophistication of operations presents many challenges to coordinate within this eclectic region.

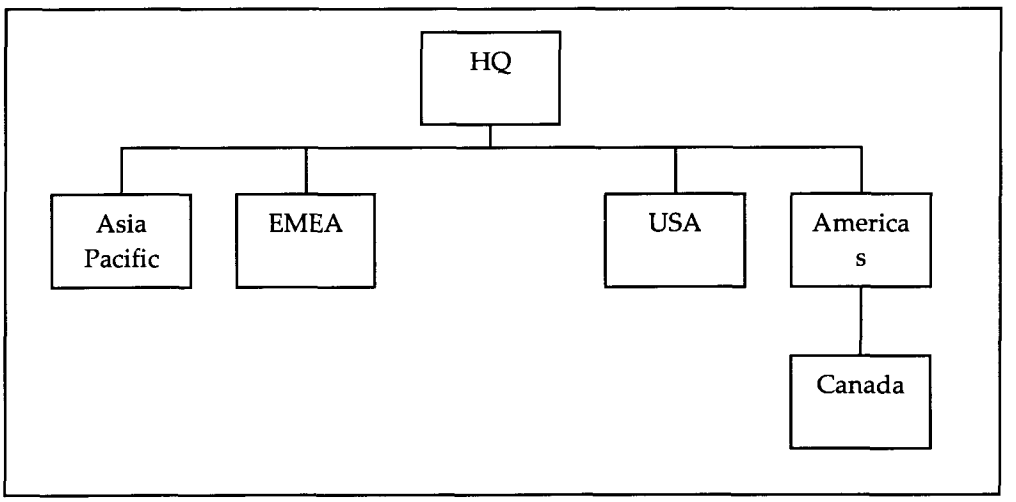


Figure 7 Geographic Regions for Company A

The organizational structure of the country separates the different business units from one another as well as the support divisions. Business units are defined as product

categories where the major units are footwear (FW), apparel (AP), equipment (EQ), and the newly formed golf (GF) division. The business units are responsible for the line of products that they bring into the country to sell as well as ensuring that the proper quantities are brought in at the appropriate time. The other divisions are sales (SL), marketing (MK), operations & technology (OP), human resources (HR), and finance (FI).

There are a few interesting points about the organizational structure to note for "Company A" in Canada. The business systems analysts (BSA), part of the operations and technology division, supports most of the business systems with the exception of sales that have their own systems support team, Sales Operations (SOP). The separation leads to potential crossover areas of support coverage leading to greater isolation of the business units into silos. Also interesting is that order managers who create the orders are part operations and not sales. The bundling of operations and order management makes sense in terms of placing order allocation with the gatekeepers of the inventory. However, it does introduce an extra step between entering a sale and creating an order.

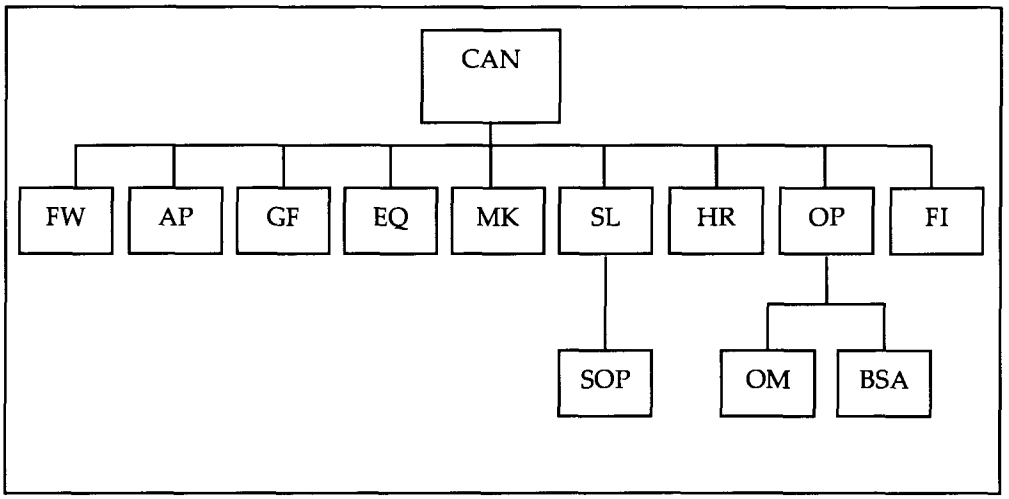


Figure 8 Organizational Reporting Structure of "Company A" Canada

2.6.2 Technological Structure

All technological systems are supported out of the Headquarters in the US. Each country has some input into which modules or pieces of technologies which they wish to adopt. However, the head office ultimately approves the systems used. The actual servers that house all the enterprise systems all reside in the main offices. The systems experts are also staffed in the head office ready to support the local systems support staff. During vendor selection, representatives from the various countries are also consulted with the final decision resting with the main office. The local IT team provides very little strategic direction for "Company A" Canada. The team is primarily a support unit that helps support routine day-to-day issues. They also serve as an intermediary between the local end users within the countries and the global systems team, the ones who actually maintain the systems in the headquarters.

The consolidation of systems allows for standardization of enterprise solutions; therefore, it unifies business processes. The result is that tighter controls can be placed to ensure quality of operations as well as integrity of the information. The enormous size of the company and the complexity of the interactions necessitate structure.

2.7 Summary of Company Analysis

"Company A" is navigating its business with the corporate goals in mind. It has been active in the acquisition of other sporting goods manufacturing companies within and outside its market vertical. Although in most cases, the original brand of the acquired company is retained, "Company A" also move into new verticals leveraging the strength of their own brand as is the case with their foray into the lucrative golf market. The drive to leverage their growth potential does not seem to be slowing anytime soon.

Large investments have been made to improve the supply chain efficiency. In spite of the best efforts to standardize processes and controls, the variability of challenges faced by the local subsidiaries necessitates process exceptions to address customer needs. These exceptions are often permitted at the expense of operational

efficiencies. Also, a large majority of the users have not been adequately trained on the systems. The company can not afford to take time away from customer service or business development for training, especially for staff in strategic positions. Ironically, users who hold important positions in the company are the ones that should have the most detailed training to allow them to fully leverage the features of the enterprise system.

The company analysis provides an insight into the challenges that a multi-national company faces in trying to manage the different operations all around the world. Even though it's not explicitly stated, the over-riding priority amongst the company goals is customer satisfaction and the associated growth of the brand. The analysis emphasizes that recommendations should involve system and non-system changes. "Company A" has been aggressive about adopting the best software systems available, but yet they have not received the full return on their investments because of factors that are non-system related. As a result, recommended technological implementations should be tempered with careful analysis of the likelihood of adoption by all users.

3 SUPPLY CHAIN ANALYSIS

The supply chain process of "Company A" is analyzed to understand the challenges that the company must contend with during day to day operations in terms of scope and complexity. This section also identifies the major supply chain issues facing "Company A". These issues, extracted through private conversations with various employees at "Company A", can only be fully appreciated through careful analysis of the process. Thorough understanding of the processes is also necessary to provide plausible recommendations. It also provides the baseline from which the recommendations will be made.

3.1 Current systems

3.1.1 Sales

An internal 'Sales Operations' department supports the sales team. The Sales Ops team is independent of the corporate Business Solutions team that supports all business systems outside of sales. The importance of sales in not only bringing in revenue but also mining the data for the purposes of business intelligence and forecasting has created the need for a sales-dedicated systems support group.

The main sales software system used is Seibel. Only a fraction of the full functionality of the tool is used. The business intelligence and customer performance reporting is generated through other third party or customized tools maintained by the Sales Ops team. Sales orders from customers are entered by sales managers through Seibel for smaller sized accounts. However, an e-commerce web portal is also available to more technologically savvy customers who are able to manage their own accounts independently. The e-commerce engine supports payments, orders, and returns. There are also incentive programs in place to encourage customer to use the internet tool. Other established department stores use Electronic Data Interchange (EDI) to

communicate ordering and payment information. However, large accounts are often managed personally with orders placed over the phone or through faxes.

3.1.2 Purchasing

The purchasing function is owned by the business units. They are responsible for maintaining the correct amount of stock to match the order requirements from sales. Since the majority of manufacturing occurs overseas through contract factories, generous lead times are required between issuing the PO and the arrival date into the distribution center. Currently, the lead time for issuing PO's or futures order is six months prior to delivery. The rather long gap requires accurate forecasting so that the correct amount of the right product is brought in at the appropriate time.

The business units use a demand-forecasting tool called i2 to project the demand six months into the future. There are also pre-determined 'buy windows' where PO's are accepted for purchasing. The demand-planning tool combines data historical purchase information along with supplier constraints to derive a forecasted demand amount using a series of complicated proprietary algorithms. It is integrated into SAP, the ERP system, and together delivery schedules are planned in advance as well. For all non-domestic purchases, from factories outside of Canada, the local i2 system is synchronized with the global system in order to create a global buy list. The bundling of regional demand affords economies of scale unit transaction cost savings.

3.1.3 ERP

The core application upon which the entire operation runs on is SAP. The other operational enterprise systems such as Seibel and i2 feed into SAP. Like all ERP, the value in SAP is the tracking of all resources within the global organization. The result is real-time visibility on order status, inventory position, and purchasing status. The scalability and stability of the tool supports complicated classification schemes that enable management reports that helps executives run the business.

HR uses a tool called PeopleSoft to help them manage employee information. Large organizations such as "Company A" can extract value from understanding and optimizing the skill sets within the corporation. The software also allows the global HR department to share one system. Unified systems allow for better control on salaries and benefits. It also allows the proper identification of fellow employees from other countries.

3.1.4 Ad Hoc Systems

The biggest issue with global enterprise systems is that the configuration cannot satisfy the unique needs of the different countries. In addition, since the ERP system is used by the entire global operations, reporting from the transactional database would tie up resources unnecessarily. For this reason, Canada has its own data warehouse from which all country-specific data is uploaded to on a nightly basis. The data warehouse (BRIO) is faster to report from and the information is presented in reporting cubes so that extensive knowledge of the SAP data architecture is not required. Users can use a GUI (graphic user interface) to customize the desired reporting view.

In spite of the data warehouse, there are still country-specific processes and analyses that the global configuration of SAP and BRIO cannot support. In Canada, local MS Access databases and Excel spreadsheets are quite common to help the users fulfill their roles within the requirements of the global directives and more specifically the limitations of SAP. In the absence of a local technology development team, there is danger that these local tools are not audited for accuracy of information. The users, generally not technical experts, usually build these ad hoc tools themselves and make executive decisions based on these tools risking data integrity issues. These important management tools are often stored on their own local hard drives that are not subject to backup. Finally, many roles in the company cannot be covered during absence because the tool used to perform the job function is only by one person.

3.2 Current process

The complete supply chain process in "Company A" is summarized and mapped in Appendix, section 7.2. The high-level process is mapped with IDEF0 convention in combination with additional systems and location information included as icons. The process can be separated into five distinct high-level activities each involving various parts of the organization both domestically and head office.

Table 7 High Level Activities of Supply Chain

High Level Activity	HQ Functional Groups	Canada Functional Groups
Plan & Sell products	Product Innovation Team	Sales and Business Units
Place PO	Global Business Units	Business Units
Order products	N/A	Sales and Order Managers
Deliver products	Global Logistics	Distribution and Logistics
Invoice & collect	N/A	Finance

3.2.1 Plan and Sell Products

The introduction of a new product into the supply begins at the Product Innovation Team. Sponsored athletes, elite level competitive athletes, sports trainers, and sports medicine experts are consulted to gather product performance requirements. Within the research group, the advanced materials group are constantly developing new products with properties ideal for sporting goods. Designers gather the available information and materials to develop new products for upcoming seasons. The proposed new products are tested for functionality in the testing labs and subjected to focus groups to determine market acceptance. For products created specifically with a particular spokesperson in mind, the endorsed athlete must approve the final design. Once the product is approved for the market, prototypes or design specifications are sent out to the factories so that samples can be made for all the different countries. Sales managers hosts previews for their clients using the samples to test local market acceptance and generate interests.

For product with short life cycles, accurate demand plans are critical to maximizing profit potential. However, in a fickle market subject to rapidly changing fashion trends and customer preferences, properly forecasting demand is a difficult process. In "Company A", product innovation is one of their competitive advantages. They are always developing new products through their R&D Product Innovation Team. New products without a prior market history complicate the forecasting process even further. The portion of the process that involves the creation of the product plan to sell in the upcoming season is represented by **Figure 9**. The final product list offered to Canada is first screened by the global merchandising group to match the purchasing patterns of the Canadian market. Local merchandisers will further reduce the list of products to arrive at the finalized list of products to offer. Customer preview sessions are conducted to provide indication about demand. Together with the planning tool i2, the product planners project the future demand for new and returning products for that are to be sold two seasons into the future. The tool is not used however for short-term to medium-term footwear planning. "Company A" uses SAP, which generates its demand plans from invoices and orders. Long-term footwear and apparel demand planning is reliant on i2.

3.2.2 Place PO

At pre-set purchasing windows, typically six months prior to the start of a new season, the business units submit factory purchase orders (PO's) to the appropriate plants. For factories outside of Canada, the business units need to consult the global planning teams so that regional orders can be bundled for batch manufacturing to reduce unit transaction costs. The non-domestic PO's are ultimately placed by the global planning team. After the order has been placed, the local business units will adjust their planning tools to reflect the final ordered amount. For domestic factory orders, the legacy warehouse management system is used to issue the PO's. There are plans to use SAP to issue the global PO's by the end of the year.

"Company A" employs people to monitor all their factories. They provide the liaison between the issuant of the PO's and the factories to provide update on projected status of the production, issues, and delays. They also ensure that the factories follow the strict corporate guidelines set to ensure fair employment practices are adhered to.

3.2.3 Order Product

Mobile sales managers use Seibel to capture orders from small stores from remote locations. The orders are entered into the CRM tool and the finalized orders are synchronized with SAP for confirmation. Customers can also choose the e-commerce portal for managing their own account. Through a .NET application, customers can securely view available products, place new orders, edit existing orders, submit returns, pay their balances and track the status of their orders. They still have access to a sales representative, but general requests can be self-managed. Clients are encouraged to use the portal through discount plans and the acceptance of credit cards as a form of payment so they can take advantage of the credit terms as well as accumulate loyalty points.

Larger accounts have dedicated order managers that look after their accounts. Orders are sent via fax or over the phone and the dedicated order managers will convert the data into SAP orders. Other more established departmental stores that deal with a large number of different vendors, all customer order communication is conducted over EDI. The EDI transmissions are captured and uploaded to SAP through EDI connectors native to SAP.

Once the orders are uploaded, integration errors are checked and fixed. The captured orders need to be quickly reviewed also to ensure that there are no obvious errors. Changes to orders need to be updated immediately as it affects supply planning and delivery planning. In spite of the futures orders model, most of the large customers do not place their orders till a month of two before the delivery date or adjust the initial orders months before the order is due to be shipped.

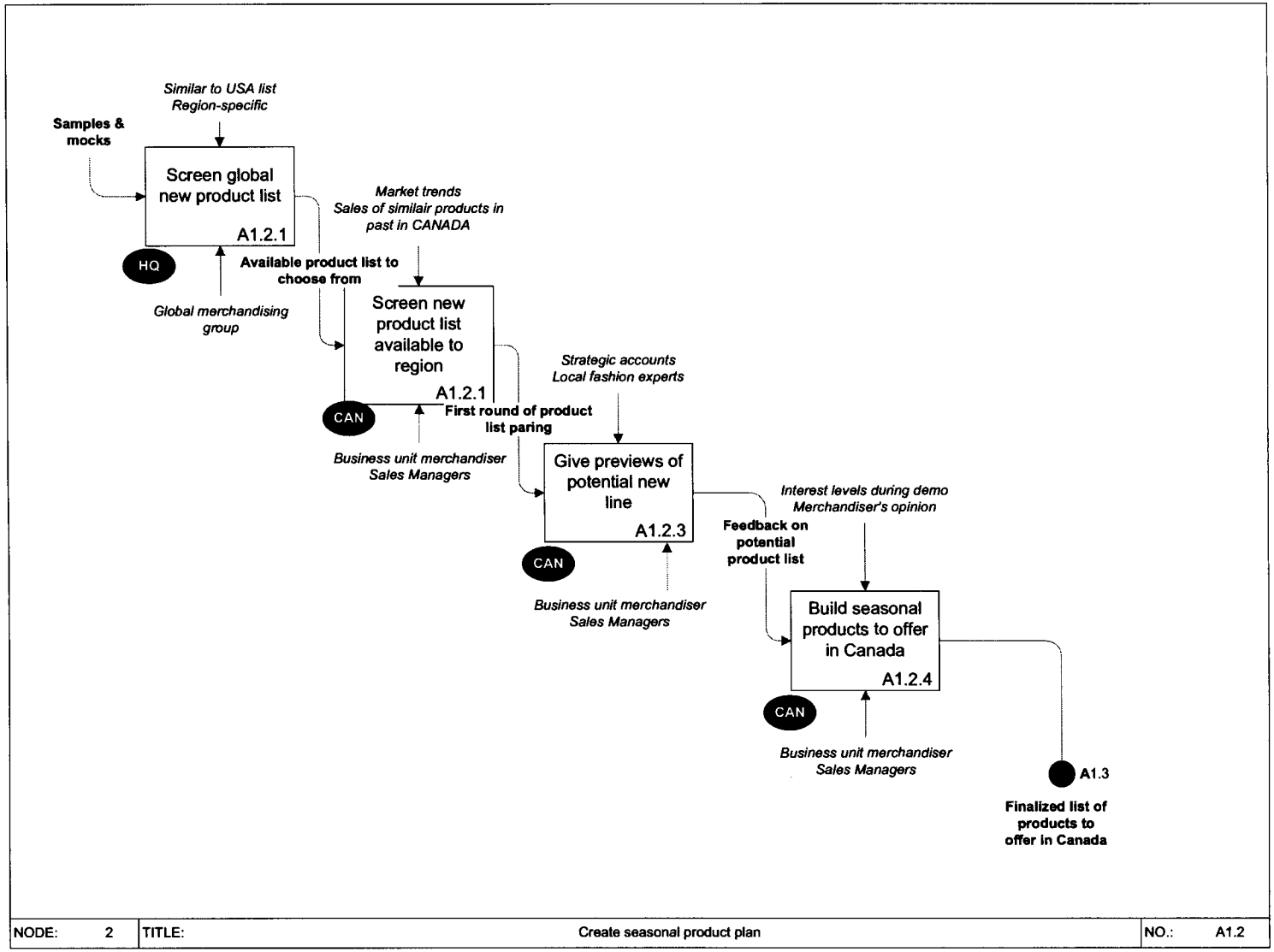


Figure 9 Process Diagram Representing Planning and Selling a Seasonal Product in Company A Canada

3.2.4 Deliver Product

Once the goods have been manufactured, consolidators are used to pool various factory orders from the region together so that they can be shipped across the Pacific Ocean in one freighter. As with the global bulk ordering process, the batch shipments translate to a considerable amount of transit costs. The coordination of third party logistics include movement of goods from the factories, to consolidators, to the ocean freight ships, and finally to trucks and/or trains that will carry the goods to the destination from the port of landing. "Company A" begins to have detailed visibility on the status of the product once it reaches the consolidators. Future enhancements in the supply chain process will allow for the early allocation of product that is still en route to Canada on the ocean vessels.

Customer clearance is handled by third party brokerage firm. A detailed description of the material entering the country must be communicated before the brokerage firm can properly fill out the clearance papers and help Canadian customs assess the correct duty amount. The brokerage firm also is advised of scheduled incoming vessels so that preparation of paperwork commences well before the ships dock in the country.

The brokerage firm also helps the planning process of the distribution center by sending updates on the project customs release date. Advance notice allows the warehouse to plan their inbound and processing schedule. The information also updates the order status through the matching of factory PO's to customer orders.

Orders are filled based on the customer request date. To avoid spikes in activity, processing of orders are often carried out ahead of expected delivery dates to 'level' the resource workload. During low activity, orders in the future are picked, packed, and stored at a designated location for shipment at the customer requested date.

3.2.5 Invoice and Collect Payment

Customer invoices are triggered once Goods Issues is complete, or once the orders are shipped out of the warehouse the customer. Depending on the payment terms, the invoices are automatically generated through SAP and sent to the customers. The financial statements are updated where inventory is removed from the books and the accounts receivable account reflects the issued invoice. Authorized returns will reflect a similar updates to the financial accounts. Customer payment history is used by order managers prior to approving an order. Credit checks are conducted on an account before an order is confirmed. Poor credit history can result in orders being put on hold until outstanding balances are resolved.

3.3 Issues

3.3.1 Inaccurate Demand Plans

Ideally, product is ordered six months prior to the delivery of the product. More specifically, every PO issued should have a matching futures order for which it is meant to fulfill. In reality, the futures order business model is very difficult to enforce on clients that do not use advanced planning tools to forecast future demands. Even for customers diligent with tracking their end-customer buying behaviour, projecting six months in ahead is difficult proposition. Combined with past failure to deliver product in the right amounts and in a timely manner has lead to future orders that are not very reliable not only because of the uncertainty involved with a half-year projection but also because of aggressive 'gaming' by the customer to ensure that they ere on the side of caution.

Unforeseen events can adversely affect even thoroughly constructed plans. In 2003, "Company A" experienced great difficulties in matching demand plan and actual demand. The outbreak of SARS (severe acute respiratory syndrome) was a large factor. Asia, the origin of the outbreak and the most affected, saw their economy stalled as experts and government tried to comprehend the exact nature of the epidemic. The

result was a slow down in the productivity in the Asian factories and order dates and amounts being compromised. Further worsening the problem, the largest market in Canada, Toronto, was also heavily hit by the epidemic. Shoppers stayed away from the malls in fear of contracting the disease. Otherwise, realistic demand plans filled shelves of stores without any customers.

"Company A" is very cognizant of trying to lower supply chain costs. They enforce the futures orders business model on their customers so that they can minimize the amount of inventory time. Inventory carries heavy costs associated with maintenance, tied up cash flow, and financial risk due to unpredictability about how well the goods will be sold. They want to move away from the model where inventory is a buffer for the volatility of demand. The forecasts are supposed to reflect as closely as possible to actual orders. Unfortunately, forecasts are difficult to predict especially when the lead-time is six months. Forecasting tools (Koch, 2004) are just as vulnerable to producing poor plans that can lead to over $US 100 million of lost revenue due to stock out problems in North America alone as experience by Nike in June 2000. This does not include, the untracked millions of dollars lost due to major discounting of over-stock items.

3.3.2 Suppliers

The large geographic distance of the third party suppliers coupled with the lack of true systems integration with the suppliers presents real difficulties in communicating. Many of the suppliers are unsophisticated sewing machine plants where employees manually stitch the various parts of a shoe or article of clothing together. The factory workers will stitch the same footwear or apparel for weeks on end. The repetitive mind-numbing task is often subject to errors and the maximum output of a typical footwear factory is one pair of shoes every three hours (Bernstein, 2001, p. 94-95). The process controls in these plants typically do not follow industry best practices such as sigma-six. In general, productivity, quality control, and visibility on the progress of any particular batch of products being manufactured are very poor. The

result is that the delivered finished goods are often plagued by delivery delays and prone to quality issues.

Since the degree of integration between "Company A" and suppliers are minimal, changes to factory orders are very difficult to change mid-stream. If demand during a season exceeded projections, it would be very difficult to have the plants produce more of the specific model after they have finished their batch. In addition, the unskilled labourers employed by the plants are very adept at sewing the same patterns, but extra complexities in design require substantial ramp-up times. The resulting responsiveness of the plants is quite low to changes in construction requirements.

3.3.3 Difficult Customers

Big accounts are often afforded special treatment. They are allowed to place their orders well after the futures order window. Sales managers will place initial futures order estimates during the appropriate buy windows. However, the customers reserve the right to cancel their orders quite free from punishment anytime they wish. The SAP system at "Company A" only identifies order cancellation reason codes as either "Company-related" or "Customer-related". Further, return codes are not used to identify returns due to customer cancellation without valid reasons. The ordered stock will remain in inventory utilizing warehouse resources, both floor space and maintenance labour until it is allocated to other orders. On the other hand, the stock from the cancelled orders will remain in inventory after the current season has passed and substantial markdowns are applied to clear the stock to free purge it from inventory and free up resources for incoming stock for the upcoming seasons. Accounts notorious for over ordering and cancelling are not held accountable for their practices because profitability reports do not include the cost of cancellations with respect to a particular client.

Many customers do not employ sophisticated inventory management systems in their retail space. As a result, the actual stock levels in the stores are not accurately known. In addition, point of sales (POS) information is not properly recorded. When

made available, the reports often need to be run only when all the information from all the stores are compiled, sometimes manually. These consolidated purchasing behaviour reports are often only available once a month due to the large amount of effort needed to generate. In the case of one major customer, the sell through report cannot be exported into a usable data format. This information is given to the sales team of "Company A" in a printed format. The inflexible legacy system of many of the major distributors for "Company A" hinders true integration of the supply chain with customers.

3.4 Summary of Supply Chain Process

In the evaluation of the supply chain process at "Company A", it becomes evident that the major issue can be distilled to the poor coordination of information between the various nodes along the supply chain. The three major obstacles identified are the inaccuracy of demand plans, supplier management and customer management. The underlying issues that have lead to these obstacles can be classified as market specific, company specific and customer specific. The market volatility contributing to forecasting inaccuracy is a market specific issue. The inability of suppliers to deliver on time and in full is a company specific issue where risks in procurement are a source of problems. Finally, demanding retail channel partners present customer specific challenges.

The recommendations to address these issues will focus on the three identified areas. The different ways to improve communication is to bridge the gaps between the nodes. The choice of tactic for bridging the gap will differentiate the alternatives proposed. A bridge can be built either through acquisition, increased partnership, or technology.

4 STRATEGIC SUPPLY CHAIN ALTERNATIVES

The following three alternatives are designed to address the supply chain issues raised in the previous section. The main problems can be summarized as customer-specific, supplier-specific, and market-specific. The alternatives, through Balanced Score Carding (Kaplan, 1992, p. 72), will be evaluated to identify how well they deliver on the corporate goals. The fourth alternative, the status quo, will also be considered as an alternative whereby the current state is checked to see whether it is better than adopting any of the proposed alternatives.

The alternatives were selected based on literature search on current practices adopted in industry to address issues in supply chain management. The alternatives specifically were chosen for the potential to resolve communication challenges along the supply chain. The subsequent analysis in **Section 5** involves weighting that is based on interpretation of the corporate goals. Customer service and financial goals appear to be the biggest drivers for the organization while innovation and internal perspectives would appear to be secondary drivers. Once again, the core capability of "Company A" is in sales and marketing so logically customer satisfaction and financial performance would be favoured indicators of success.

Table 8 List of Four Alternatives

No.	Alternatives
1	Vertical integration into suppliers
2	Increase level of partnerships with supply chain partners without equity investment
3	Maintain existing levels of supply chain partner interactions but with an increase in technologies – **Integrated Information Hub**
4	Status Quo

4.1 Vertically Integrate into Manufacturing

The first recommendation is to expand the company vertical to include manufacturing. Third party suppliers in developing countries have huge cost advantages; however, the quality and delivery confidence is low since the plants typically are not technologically advanced required long lead times to start building a new product. By not outsourcing product manufacturing, "Company A" can control quality, increase visibility over production status, and dictate product schedules internally.

4.1.1 Implementation Plan for Vertical Integration into Suppliers

4.1.1.1 Location

It is recommended that "Company A" not only runs its own 'non-arms length' factories, but situates itself in politically stable countries around the world. The higher costs of labour and materials in developed countries are off-set by availability of infrastructure and skilled labour to build a flexible plant with high standards of quality. The current plants in developing countries employ uneducated employees to manually sew footwear and clothing. The proposed plant will be technologically advanced with most of the manufacturing automated where machine operators responsible for maintenance and quality control make up the bulk of the workforce. The five New Balance, privately-owned sporting goods manufacturing company, US factories are exemplifies how domestic manufacturing in North America can compete with the much lower labour costs in Asia. The US plants on average can build a shoe in about 20 minutes compared to the 3 hour average at a factory in Asia (Bernstein, 2001). Comparing an average hourly rate in the US at around $14 (USD) with that of $0.40 in China, the difference in cost per shoe is $4 (USD) compared with $1.30 in China. The remaining cost differential is 4% the retail cost of $70 (USD) for an average pair of shoes.

4.1.1.2 Mass customization

Through the integration of production into operations, R&D can work with the production plants to create designs that are easier to manufacture. Designs will also include parts that can be used in a line of different finished goods. For instance, the construction of shoes can be divided into upper, mid-sole, cushioning, tread, laces, and other raw-material inventory. The forecasting of raw materials tend to be more accurate than that for finished goods which require a much more detailed level of granularity. The inter-changeability of parts will increase production flexibility and reduce lead time. Similarly, apparel production can be mass customized where manufacturing can be completed through various degrees of completion and later customized to meet the particular requirements of the local market. Benetton and Hewlett-Packard both employ the practice of "postponement" (Feitzinger, 1997, p. 117 & Dapiran, 1992, p. 8-9) where their products are designed around a small list of platforms and the final customization of the product to a finished good is delayed as long as possible. The delay reduces the forecasting horizon which reduces uncertainty in forecasting. For instance, Benetton employs the practice of continually manufacturing white-coloured t-shirts. The plain shirts are stored and turned into the finished product, with proper patterns, at the last possible moment.

4.1.2 Advantages of Vertical Integration into Suppliers

4.1.2.1 Brand Image

Controlling their own factories and placing them in politically stable countries, "Company A" can reduce the risk of production disruptions. It would also help increase the brand image in the eyes of conscientious buyers who question the labour practices in developing countries and would look favourably upon products that are built in countries with non-exploitive labour laws. Plants in countries in US also signal higher quality product compared to factories in third world countries. The implicit quality

advantages could sway potential buyers who are more concerned about quality when paying, on average, $70 (USD) for a pair of shoes at the retail.

In the third party factories with poor controls on inventories and very loose controls on security, pilferage is quite common and in significant volumes. The result is the availability of stolen items on the market. The service agreements with the factories are also very difficult to enforce, especially in China. After an order has been completed, the factories can be contracted out to build facsimiles of the original "Company A" products and sold for a fraction of the price on the thriving counterfeit market. Stolen goods and counterfeits will take up market share as well as dilute brand image. By operating their own factories in stabilized countries with enforceable copyright protection laws, the risk of theft and counterfeiting is greatly reduced.

4.1.2.2 Increase performance

Flexibility in response to changing market trends, where the mass customizable design schemes allow much lower lead times. The employees are educated in the value of teamwork so that they can cover for an absentee or helping shoulder areas of heavier workload. Manufacturing best practices are adhered to ensuring quality and timely delivery of product.

4.1.2.3 Increase forecasting accuracy

A study conducted showed that demand forecasts that took into account early sales data, the first two weeks of the product's life cycle, carries an average forecast to actual demand discrepancy error of 8%. Forecasted demands that were based solely on historical numbers exhibited an average error of 55% (Fisher, 2000, p. 119). Factories that are capable of quick responses and flexible enough to change production lines will allow "Company A" to take advantage of this finding and create supply plans that are more conservative during initial parts of a season. The agile factories can respond

appropriately after the early sales data can be gathered to complement the initial demand plan.

4.1.3 Disadvantages of Vertical Integration into Suppliers

The high cost of operating a manufacturing plant will negatively impact the decision to adopt this alternative. Manufacturing is not a core competency for "Company A". There will be a lengthy period where they will be facing a rather steep learning curve to get up to speed. The company must also reorganize their performance metrics to be more strategic where profitability of the manufacturing units must not be analyzed in isolation. As an independent operational unit, it will not be able to compete on costs with manufacturing plants in developing countries. The higher unit costs must be accepted for greater flexibility and costs further down the supply chain.

4.2 Increased Partnerships across Supply Chain without Equity Investments

Rather than acquiring a primary supplier, an alternative is to increase the level of partnerships with all the partners along the supply chain. Currently, the various nodes along the supply chain are loosely connected for the most part. There are a few examples where electronic data exchange is done; however, there is very little direct integration in communication systems through the chain. In the past, the level of involvement in the way that third party partners operated was largely ignored. However, recently with the negative public backlash from the unfair labour practices in the factories, most sporting goods have already begun to adopt a more proactive relationship model. The recommendation is to take this further and not ensure fair labour practices but also optimized operational performances.

4.2.1 Implementation Plan for Increases Supply Chain Partnerships without Equity Investment

4.2.1.1 Joint-Investment

There should be joint-investment projects in place that will help introduce new technologies into the various partners along the supply chain. "Company A" should provide cash credits that can be redeemed by customers to help offset investments in technological upgrades. Currently, POS information in most of the customer's retail stores is poor to non-existent. The credits can be used against future purchases of products. Providing credits as incentives will reduce the impact on the company's cash reserves while at the same time possibly increase the volume of sales orders because of the discounting. The POS information, with "real-time" availability, will help "Company A" immensely with forecasting and supply chain visibility right through to the retail store level. That granularity of sell through information is valuable business intelligence information that would help understand the market and react appropriately. A more aggressive investment partnership may also be negotiated whereby the majority of the cost is paid for by "Company A" and in return, the data collected belongs to "Company A". The customer, or other vendors, must pay for the sell-through information. This might be a better option as competitive information can be retained as a source of competitive advantage.

Although it is not necessary to outright acquire a manufacturing plant, joint-investment is highly recommended. Most of the archaic factories could use technological upgrades to increase efficiencies and better monitor production status. It is a little more difficult to provide incentives for the suppliers to embrace technology with their staggering cost advantages they are able to compete very well on unskilled labour alone. As a result, the recommendation is to offer a partnership that includes guaranteed amount of business for upgrading the technology infrastructure. The factories will have the reassurance that they have enough business to maintain their operations while "Company A" can reserve production capacity. The technology

upgrades should include inventory tracking, production status tracking, automated PO system, and even manufacturing equipment upgrades to ensure quality of finished material. And most importantly, the system must integrate directly with "Company A" so that 'real-time' visibility is possible.

The support and maintenance of these systems could possibly be retained by "Company A" through their factory liaison offices. The service will address concerns about service disruptions and more strategically customize the technology investments enough so that the optimal benefits can only be realized from engagements with "Company A". For instance, the configuration of the system is designed for optimal integration with only "Company A", the production machinery are designed specifically for "Company A" specific product designs and practices. This will prevent the competition from benefiting as well from the upgraded third party factories. Additionally, by guaranteeing a certain minimum amount of business, "Company A" will effectively hold the factories on retainer by maximizing their capacity to prevent the factories from taking on the business of the competitor.

4.2.1.2 Knowledge Sharing

"Company A" employs market developers to educate the sales associates working at the retail stores about the technologies in their product line teach them customer service techniques to help them sell effectively. This value-added service they provide for their retail channel has proven very effective in making the channels better at selling the product. "Company A" should also provide supply chain education to the retail channels. For instance, when a customer exchanges a pair of shoes for a different size, returned product must be 'returned' back to inventory while the exchanged item 'removed' from the system so that the correct sell through information can be collected. Buyers from the retail channels also need to be educated so that they understand the importance of accurate order forecasts and its effects on the entire supply chain.

The recommendation also calls for educating the suppliers about manufacturing best practices. Process experts should be hired by "Company A" to assist the factories in

designing their processes. Six-sigma concepts such as Total Quality Management and Kan Ban can be considered to improve efficiencies and product quality. Educating suppliers on effective management techniques is also recommended. As an example, instead of having the same employee work for 16 hours a day on the same task (Bailey, 2004, p. 12), they should consider rotating the activity of each staff and reduce the total hours worked in a day. Long work day and monotony of routine are factors in lower productivity levels (Bernstein, 2001).

4.2.1.3 Shared Performance Metrics

One of the biggest deficiencies in the supply chain process of "Company A" is the lack of share performance metrics across the entire supply chain. Profitability analyses need to be conducted by client and per business unit on a strategic level that will include all the associated costs of the supply chain. Instead of simply looking at the total revenues generated from a particular client or the total sales from footwear, the total profit needs to be calculated. Profitability calculations are essentially revenues less costs. Since revenues are tracked rigorously, the first step is to understand the cost structure of the supply chain better.

4.2.2 Benefits of Increased Partnership across the Supply Chain without Equity Investment

By standardizing the metrics upon which the performance is measured, the health of the supply chain can be properly assessed. For example, if it costs $250,000 for each day that a particular product is delayed in terms of time to market, then the entire supply chain should reflect this cost in their performance metrics. Management within the various nodes will understand the time sensitivity and the cost implication so that $20,000 air shipment of the product is well worth the savings realized from bringing the product to market at the right time (Fisher, 1997, p. 105).

In spite of the costs associated with investing into the supply chain to optimize efficiencies, the savings realized throughout the chain will offset the investment costs.

The need for share performance metrics will play a bigger role in evaluating the areas to focus investments on as value to the supply chain on the strategic level will triage the appropriate segments to focus on. Accurate understanding of costs will highlight market segments that are valuable to hold on to and ones that are wise to relinquish to maximize the profitability of the company (Stalk, 2004, p. 71).

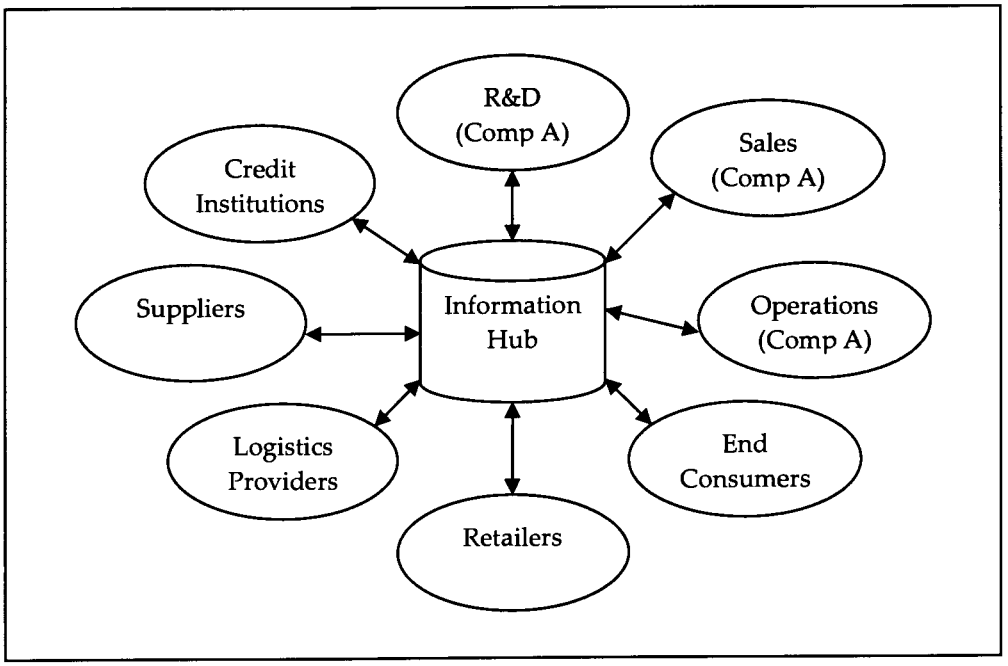
4.2.3 Disadvantages of Increasing Level of Partnerships across the Supply Chain without Equity Investment

The alternative is based on trust within the partners in the supply chain. Investments made may not bring back loyalty from the various partners. Suppliers may choose to raise the cost of production knowing that "Company A" has made sizable investments that act as a form of "lock-in". Suppliers may also offer their services to competitors after benefiting from the expertise gained through the mentorship program set up by "Company A". Since the partners are distinct organizations facing different challenges, drafting up metrics that are agreeable to all parties could prove difficult.

4.3 Integrated Information Hub

The last alternative is to build an informational hub where information from all the various partners along the chain as well as different divisions within the company can access information from. This portal will be the centralized repository where Sales can access the delivery status of a particular order on transit from factories of a supplier to the local warehouse. R&D can have access to information from the retail channels about the buying behaviour of the end customers so that they know what colours sell and in which locations. Operations can access status updates on production at a factory so that they can build their warehouse schedules months in advance. The information hub will be an interface between the disparate systems used by the various stakeholders in the supply chain. For members that do not have an ERP system to track their resource planning needs such as many of the factories in developing countries, the information hub will be accessible through a secured web interface that will provide

ERP functionality to the suppliers. The e-Hub is essentially a B2B (business to business) extranet site that is not only focused on e-procurement but also include collaborative supply chain planning and automation of execution for direct finished goods and indirect raw materials (McKelvie, 2001).



(Based on Lee, 2001, p. 7)

Figure 10 Communication Flow in E-Hub

Cisco has created and has implemented an e-Hub portal for their supplier and customers to share information within. It is a supply chain hub where machine-to-machine links are synchronized for updated visibility across the entire supply chain. Since the hub is a custom build application by Cisco, regardless of the system used by the different partners, connections can be built that will allow for integration to the hub. It also has a web-based application attached to it for customers to access should they not have systems in place that easily integrates with the hub. Information such as product manual, new products in the pipeline, and order history is available to the customers. The sales department uses the web analytics to better understand the client and build a relationship that is customized to the particular client. It also is an e-commerce application where clients can make purchases and update accounts (Lewis, 2001, p. 76).

4.3.1 Implementation Plan for Integrated Information Hub

"Company A" already has an existing e-commerce engine which may or may not be scaleable enough to be enhanced to an e-Hub. The first step is to gather requirements for information sharing between partners, automated execution and value added e-services. For information sharing, the system must integrate with all business, manufacturing, and distribution managements systems seamlessly. For partners that enter information directly into the e-Hub, user experience with the graphic user interface must be considered so that windows can be customized to the particular partner in terms of usability, branding and language. Automated execution, such as responses to overages or shortages, must be documented and built into the specifications. Value added services such as optimization, data mining, and analytics are optional and can be implemented after the basic e-Hub infrastructure has been constructed.

Partners must be convinced to allow connections to be made to their systems, and if they do not employ any enterprise systems, they must be convinced to use the interface provided through a variety of reward and punishment programs. Change requests by all users will be considered and enhancements to the application will continually be made to ensure that it is fresh and meet the demands of a changing market place. Even specific request that do not bring value to "Company A" directly but rather helps the partner performance will be considered, improved contributions from the partners will increase overall performance of the chain.

4.3.2 Advantages of an Integrated Information Hub

The e-Hub with the centralized data center will facilitate enhanced performance measurement and management as there will visibility across the entire chain for all partners in the supply chain. It will improve collaboration as disparate systems will be able to exchange information through standardized formats. It will improve decisions-making as forecasts become more accurate as information distortion is lessened. Instead of the information passing through several nodes before reaching the end of the supply chain, all the information is stored one node away from each partner. It will greatly

improve planning as the reliability of forecasting increases; therefore, maximizing efficiencies and lowering costs.

4.3.3 Disadvantages of an Integrated Information Hub

The complexity of the supply chain and the various interactions between each partner along the chain needs to be documented and accounted for in the e-Hub. Standardizing business to business interactions may alleviate a lot of the intricacies of the design, but it is still a very complicated process requiring a lot of time from every member of the supply chain. An internet information hub is a technological development venture that "Company A" has very little experience aside from their e-commerce site. The concept is also rather new and there are very few experts in this area. There is a large risk in outsourcing such a strategic component of the company value chain, especially if they wish to leverage it as a source of competitive advantage. The e-Hub will need to be constantly maintained for new partners to synchronize and change request that will surely arise. The cost of building and maintaining such a system is astronomical.

4.4 Summary of Alternatives

The external analysis showed that customer satisfaction is an important driver for the company. The internal analysis indicated that marketing and sales are the most important value activities. As a result, the alternatives should be considered based primarily on financial metrics and customer service. Given an alternative between investing resources in improving learning and increasing total sales, reaching revenue targets will take precedence. Also, alternatives that may potentially upset a client, such as strict adherences to information exchange protocols, will be frowned upon. The alternatives will be analyzed based on how well they satisfy the company goals.

5 RECOMMENDATIONS

5.1 Balance Scorecard Assessment

Balanced Scorecard is a tool developed by Kaplan and Norton (Kaplan, 1992, pp. 71-72) to provide a complete view of an organization's performance. The comparison is designed to take into the different perspectives both financial and non-financial into consideration. It is a good methodology to turning strategy into action. It will be used strategically to identify how the organization should change based on well the alternatives deliver on the goals set by senior management.

5.1.1 The Four Perspectives

Table 9 Four Perspectives of Balanced Scorecard at "Company A"

Perspective	Audience	Result
Financial	To the shareholders	Exceed industry benchmark for inventory turnaround and supply chain costs
Customer	To the customers	Achieve the top rating for service from brand building customers
Internal	With internal management process	Execute a supply chain that will create the ultimate consumer experience at retail channels
Innovation and Learning	With ability to innovate and grow	Achieve speed and flexibility to respond to dynamic customer needs and manage global supply chain

The balanced scorecard tool revolves around four perspectives. The balanced approach takes into account the financial perspective, customer perspective, internal perspective and an innovation and learning perspective. The financial perspective is focuses primarily with increasing company profitability and returns to the shareholder.

The customer perspective focuses on increasing customer experience. Internal perspective studies management practices and policies within the company. Innovation and learning stresses the value of improvement and growth. The desired result from all the perspectives is interpreted based on the corporate goals released to the organization (**Table 4**).

5.1.2 Critical Success Factors

The critical success factors are a more tangible interpretation of the perspectives making to help build critical metrics that will be analyzed for measure performance. For this evaluation, a heavy weighting will be placed on the financial and customer perspective where financial perspective slightly more. The weighting reflects the reality that not all metrics are of equal importance to a given organization. For instance, a drug development company will place a much higher importance on Innovation and Learning perspectives.

Table 10 Critical Success Factors for Balance Scorecard

Perspective	CSF	Weight
Financial	Improve inventory management, supply chain costs, and profit margins.	40%
Customer	Increase delivery precision and customer service.	30%
Internal	Build capability to plan into retail spaces.	10%
Innovation and Learning	Reduce lead times and build flexibility into supply chains. Build the capability to drive continual supply chain improvements.	10%

5.1.3 Critical Measurements

The critical measurements are assigned a value of '1' for positive effects from a given alternative, '0' for no effect, or '-1' for negative effects. Due to concerns about the release of competitive information being released against Company A, the balanced scorecard is limited to a qualitative analysis; therefore, only three scores are possible.

The factoring applied is to normalize the subtotal for each perspective to have the appropriate weighting factor. For example, the financial perspective with a total of 5 metrics would be divided by a factor of 12.5 so a perfect score of 5 would translate to the desired weighting of 40%.

5.1.3.1 Financial

The financial metrics evaluated will focus on increasing profit potential of the company. Reducing the days shipped outstanding is basically increasing cash turnaround in the company. By vertically integrating into the suppliers, "Company A" can no longer leverage the suppliers and their third party credit company as means of delaying the outlay of cash for finished goods; therefore, alternative 1 will have a score of a negative one. Inventory turns measures how much time inventory spends within the company. By vertically integrating into the suppliers, the company can delay production till the last possible moments prior to need so that inventory time is greatly reduced. E-Hub with the increased visibility right across the supply chain will reduce the build up of inventory as a buffer to offset the uncertainty about the demands in the retail channels. Increasing the forecasting accuracy will be aided by both alternative 2 and 3 because they provide a format for POS information to be captured accurately and at relatively regular intervals. Alternative 1 and 2 will help decrease the amount of discounting necessary to purge off-season products because of the ability to postpone manufacturing with the integrated supplier model and awareness on the part of customers about the negative effects of brand dilution in alternative 2. All three alternatives will positively impact the profit potential of the company.

Table 11 Financial Critical Metrics and Ratings

Perspective	Description	Alternative Ratings			
		1	2	3	4
Financial	Reduce days shipped outstanding (DSO)	-1	0	0	0
Financial	Increase inventory turns	1	0	1	0
Financial	Increase forecast accuracy	0	1	1	0
Financial	Decrease off-price sales	1	1	0	0
Financial	Increase profit margins	1	1	1	0
	Subtotal for Financial	2	3	3	0

5.1.3.2 *Customer*

Partnerships across the supply chain will allow for a more flexible ordering and shipping dates as costs implications of scenarios are better understood and strategic decisions can be made where proper trade-off analysis can be conducted. Operating their own manufacturing plants will enable the company to adjust production schedules to meet customer delivery dates as well as control the quality of the product being made. E-Hub applications with automated execution will ensure that orders are automatically placed when stock reaches critical minimum levels in the retail stores. E-Hubs are difficult to implement and require a lot of feedback on the part of the different partners to adjust their processes to input the information into the hub which would lower customer satisfaction. For partners that need to enter data directly into the e-Hub, the usability will never fully customized to the particular needs of each partner, a potential source of customer dissatisfaction. Joint-investments and continual education with the different partners will help increase customer satisfaction thus giving alternative 2 a positive grade. Achieving the customer's scorecard will bring value to the company (Day, 2003, pp. 77-78) by increasing the capabilities to deliver satisfaction to the customer. It also has been sold as a value added service provided to customers to help them better understand their business requirements while at the same time gathering valuable customer information that can used to increase customer satisfaction and be a

potential source of competitive advantage. The implementation of E-Hub will rely on the standardization of supply chain processes which could require compromises in process of a partner and negatively impact achieving their vendor scorecard. Also, by increasing partnerships and increasing the total costs by business units and customers will help the business make decisions to reduce returns and claims.

Table 12 Customer Critical Metrics and Ratings

Perspective	Description	Alternative Ratings			
		1	2	3	4
Customer	Flexible order/ship dates	0	1	0	0
Customer	Deliveries in Full and On-Time (DIFOT)	1	0	1	0
Customer	Increase customer satisfaction	0	1	-1	0
Customer	Achieve customer's vendor scorecard	0	1	-1	0
Customer	Decrease claims as a percentage of receivables	0	1	0	0
	Subtotal for Customer	1	4	-1	0

5.1.3.3 Internal

The frequency that a product is not available for ordering can be offset by controlling manufacturing to increase responsiveness to dynamic market trends. E-Hubs will allow for a direct view into the retail space from information supplied directly by the retain channels; therefore, making it possible to plan directly into the retail space.

Table 13 Internal Critical Metrics and Ratings

Perspective	Description	Alternative Ratings			
		1	2	3	4
Internal	Decrease frequency of stock-outs	1	0	0	0
Internal	Plan into the retail space	0	0	1	0
	Subtotal for Internal	1	0	1	0

5.1.3.4 *Innovation and Learning*

The access to POS information, available in alternative 2 and 3, will allow for the decrease in blind buys where purchases are made based on historical information only. This is especially problematic for new products without a prior sales history. All three scenarios will allow for in-season response in some way or another either through mass customization, increased education across the supply chain, or real-time retail channel information.

Table 14 Innovation and Learning Critical Metrics and Ratings

Perspective	Description	Alternative Ratings			
		1	2	3	4
Innovation	Decrease blind buys	0	1	1	0
Innovation	In-season response	1	1	1	0
	Subtotal for Innovation	1	2	2	0

5.2 Summary

By applying a normalized weighting where the perspectives will add up to a maximum of 1, alternative 2, or increasing the level of partnership across the supply chain without making equity investments, is the recommended choice. All three alternatives display a better score than the status quo with alternative 1 and 3 scoring very closely together. The deciding factor was how much better alternative 2 scored in the customer perspective compared to all the other alternatives. The weighting system can be re-adjusted and a different result may arise.

The other two alternatives, vertically integrating into suppliers and implementing an integrated information hub, require a sizable upfront investment, whether it is acquiring a factory or building an electronic information hub. Increasing the level of partnership amongst the supply chain allows the company to decide the level of investment they wish to make as well as the areas along the chain they will to focus on. For instance, they can choose to invest more funds in their apparel suppliers

than their footwear suppliers should the apparel business unit face more complex challenges in their supply chain management practices. The company can also choose to make the investments over the course of several years to reduce the immediate impact on their cash flow.

Table 15 Factored Total Scorecard Ratings

Perspective	Description	Alternative Ratings			
		1	2	3	4
	Factored Financial	.16	.24	.24	0
	Factored Customer	.06	.24	-.06	0
	Factored Internal	.05	0	.05	0
	Factored Innovation and Learning	.05	.10	.10	0
	FACTORED TOTAL	**0.32**	**0.58**	**0.33**	**0**

"Company A" is in the business of manufacturing and bringing to market new and innovative products. By virtue of the short product life cycle, sizable contribution margins, high product variety, and heavy end-of-season markdowns (Fisher, 1997, pp. 106-107) the products show all the attributes of being more innovative than functional. The framework described by Marshall Fisher in a 1997 paper from the *Harvard Business Review*, finds that innovative products require market-responsive supply chains that can respond quickly to continually changing market demands. To achieve a market responsive supply chain, heavy investments must be made to reduce lead time and suppliers must be chosen carefully for speed, flexibility and quality.

By proactively investing in the partners along the supply chain and building the capability of the partners, the increased flexibility and quality are essential to responding to the market effectively.

Table 16 Traits of Market-responsive Supply Chains

Traits	Details
Primary Purpose	Respond quickly to unpredictable demand to minimize stock outs, forced markdown and obsolescence
Lead time focus	Invest aggressively in ways to reduce lead time
Approach to choosing suppliers	Select primarily for speeds, flexibility, and quality
Coordination	Collaboration between suppliers and customers

6 CONCLUSION

One of the biggest supply chain challenges facing "Company A" is accurately trying to forecast demand. "Company A" leverages the cost advantages of third party suppliers in developing countries, a practice that requires a lengthy lead time of up to six months. The six month order windows places great strain on the forecasting, since estimates so far in the future are difficult to predict. Accuracy can be improved through decreasing the lead time of the futures order to reduce variables affecting the prediction. Accuracy can also be increased through improving the communication channels between the members along the supply chain so that market signals are identified as soon as possible. Opening up channels of communication between the different nodes will expedite the transfer of market signals as well as communicate the appropriate responses to the signals.

As with all linkages of activities, the system is only as strong as the weakest link where inefficiencies in one of the activities will serve as a bottleneck to reduce the effectiveness of the entire system. Optimizing all the different activities will increase overall performance of the entire supply chain. By building shared performance metrics, appropriate trade-off analysis can be made to decide which activities to optimize at another expense. An efficient supply chain is both responsive as well as stream-lined to minimize costs. However, costs analysis can not be done in isolation but rather in the context of the entire chain where cost reduction in one area must be investigated to identify effects to all parts of the system.

It recommended that "Company A" plays a more active role in building up the partnership amongst the different players in the supply chain. They need to consider investing in the supply chain, especially with their third party suppliers who both need to improve their production processes as well as technological infrastructure to facilitate flexibility and responsiveness. They should build shared performance metrics for both suppliers and customers so that costs analysis and performance is gauged strategically to include the entire system in mind and not just the individual silos.

It should be noted that access to information and people in the appropriate level of management was not possible. "Company A" was in the middle of a large systems upgrade at the time of the internship and many important stakeholders were unavailable. The sensitive nature of the much of the information also presented challenges in providing a meaningful analysis. The weighting was estimated based on the publicly released corporate goals as well as the implied goals gathered through private conversations and objective observations. The recommendations were developed through intensive literature search into supply chain solutions adopted by similar organizations in terms of industry and economies of scale.

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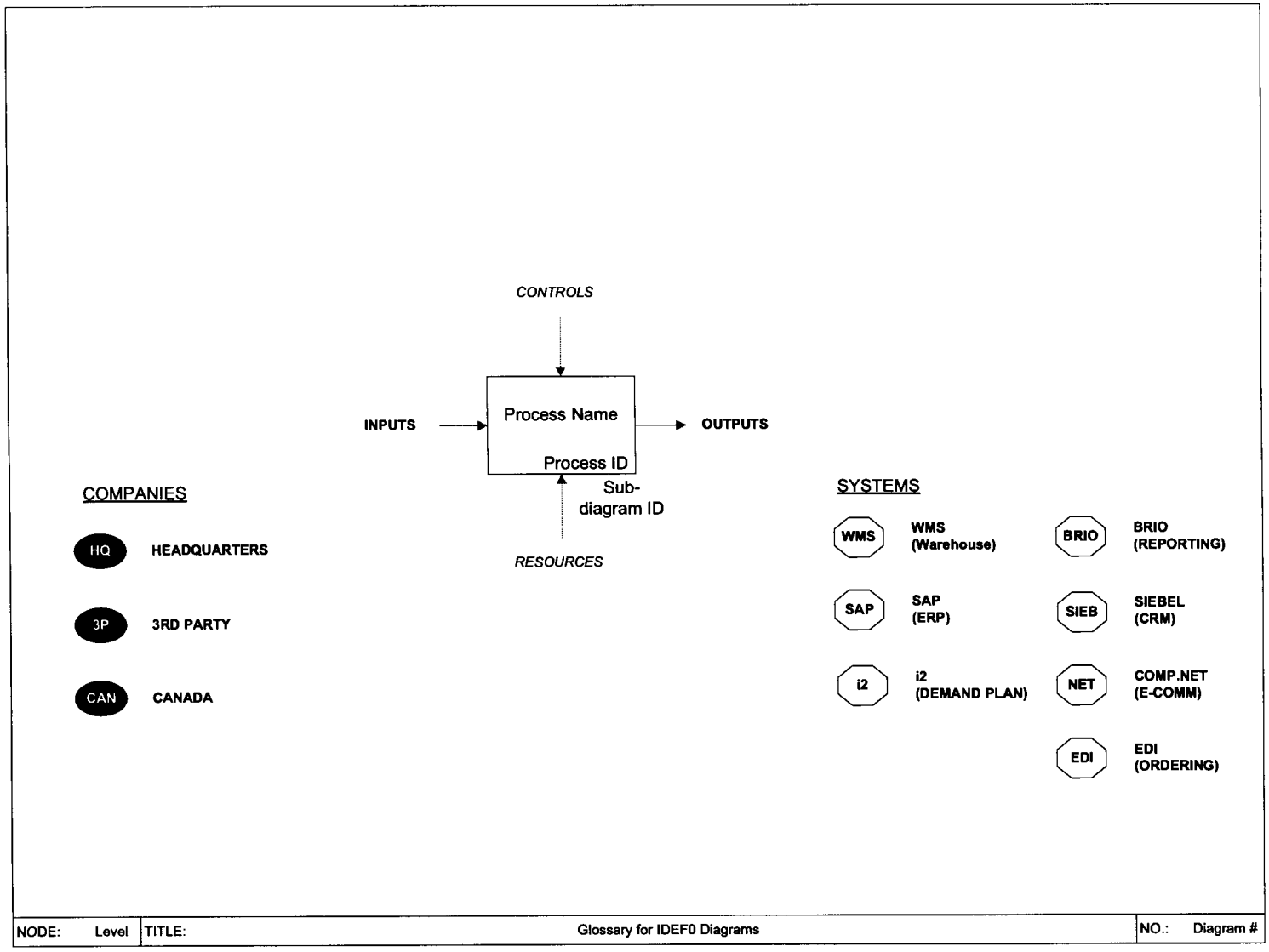
8 APPENDIX

8.1 Process Mapping

The IDEF0 process mapping of the supply chain processes for the Canadian operation of Company A. The first diagram is a glossary explaining the conventions. Aside from the basic IDEF0 convention that details inputs, outputs, controls and resources, the systems and the companies responsible for any given activities are included using icons. This is a high-level documentation to help analyze the process and provide a point of reference for recommendations and analysis work. A deeper analysis was either not pursued or omitted to preserve the integrity of confidentiality; however, the level of detail is sufficient for the purposes of the paper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Process Name
Process ID
OUTPUTS
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RESOURCES
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i2
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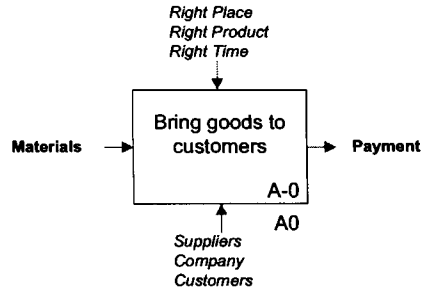
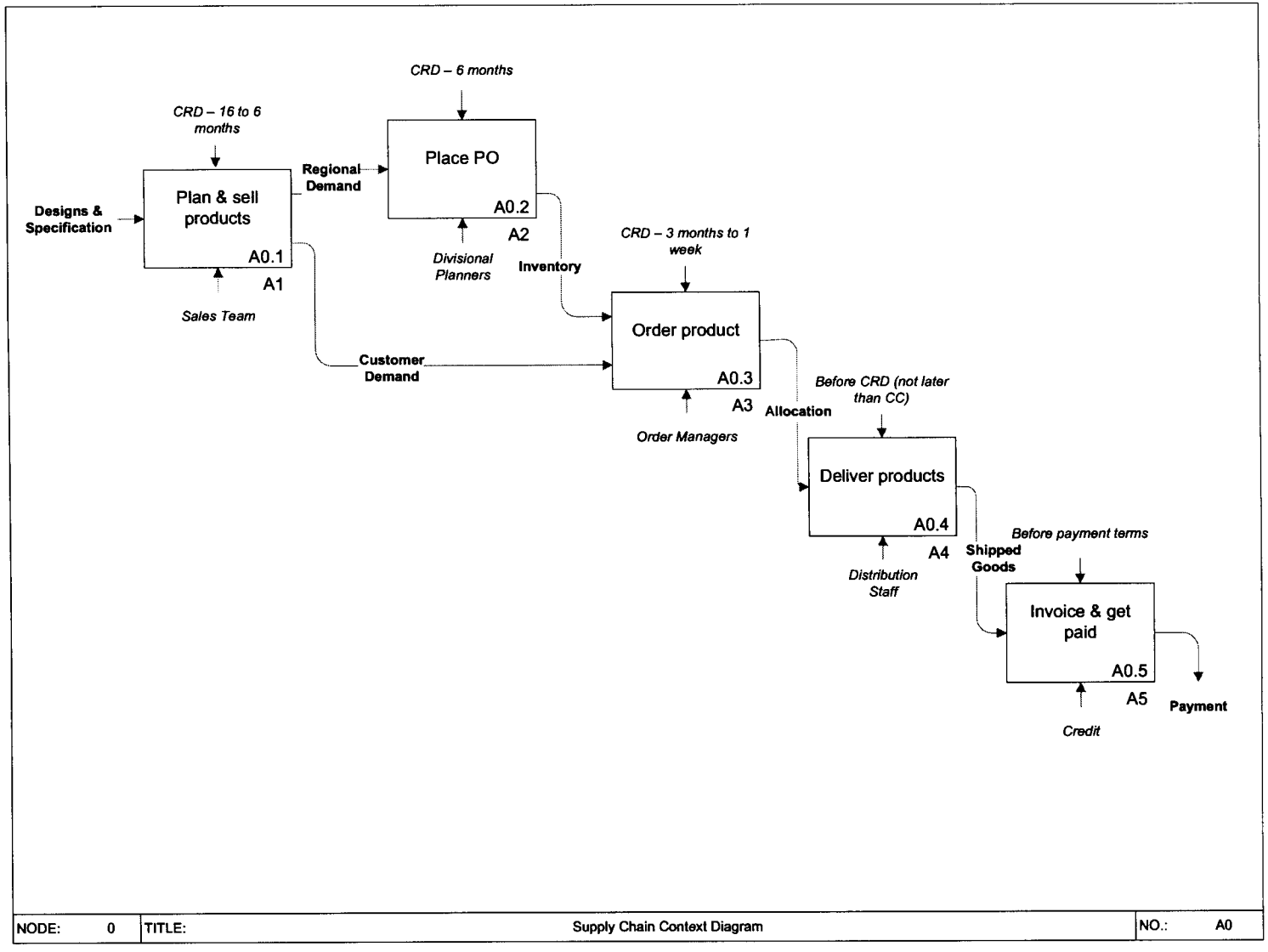
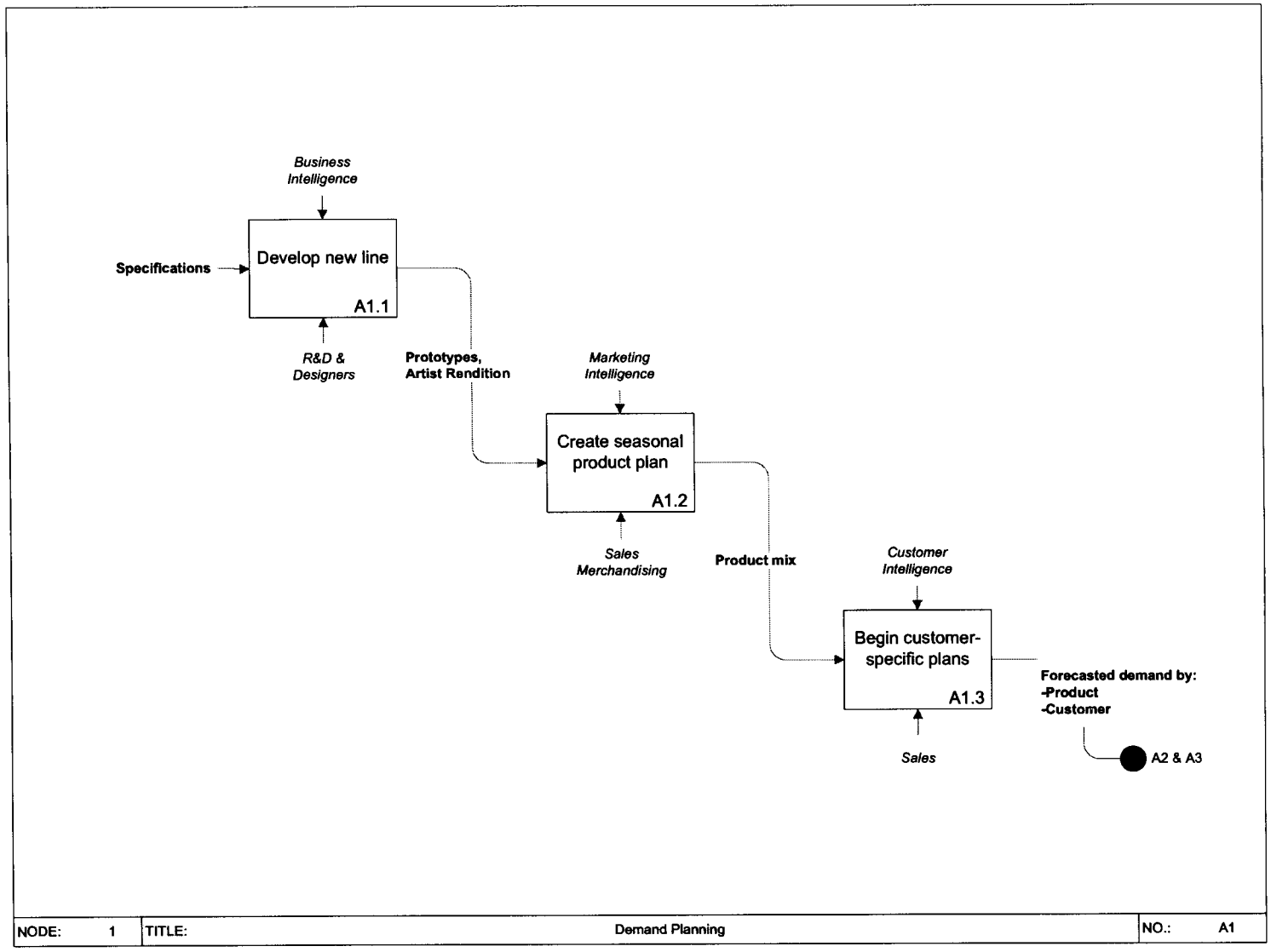
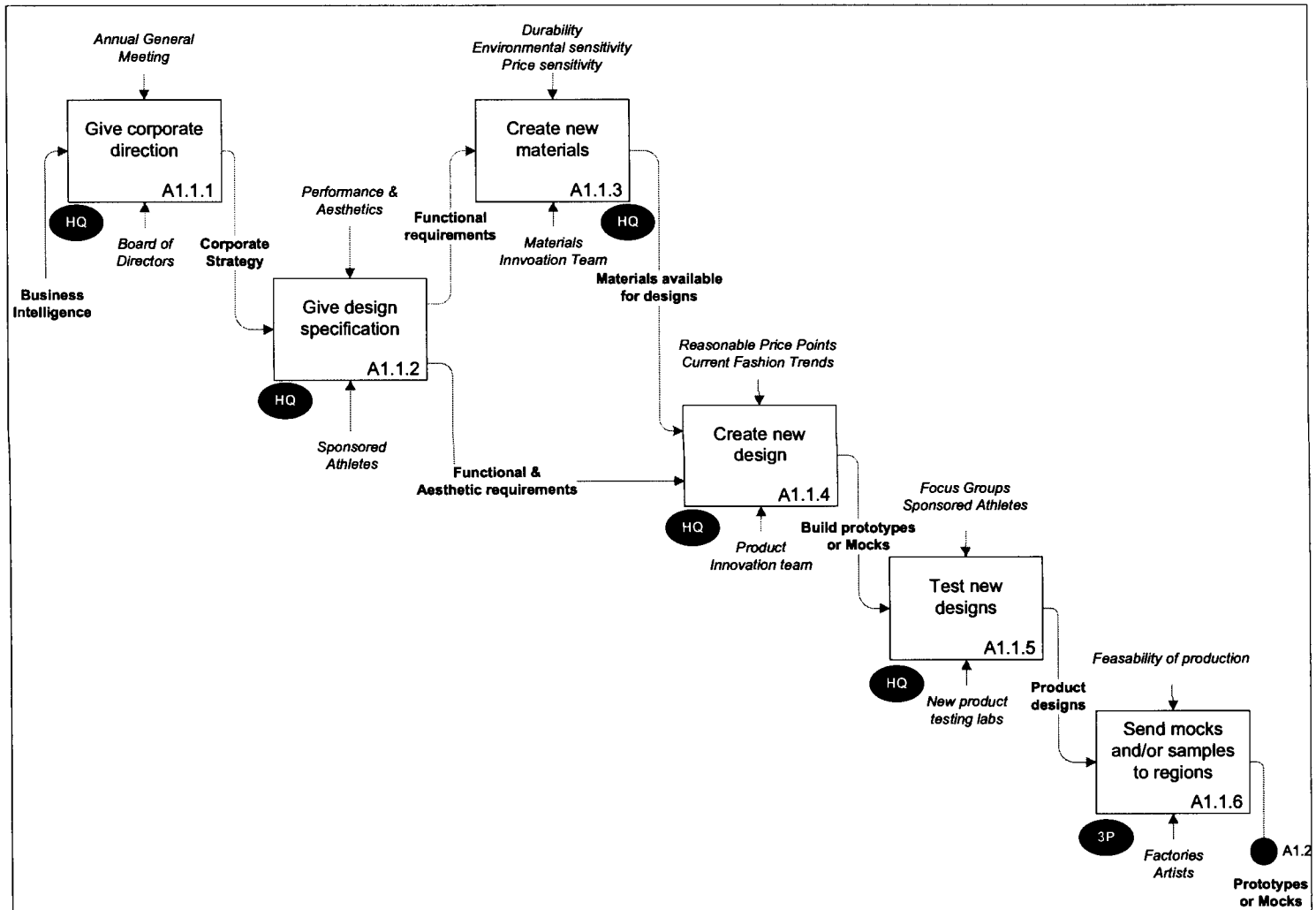
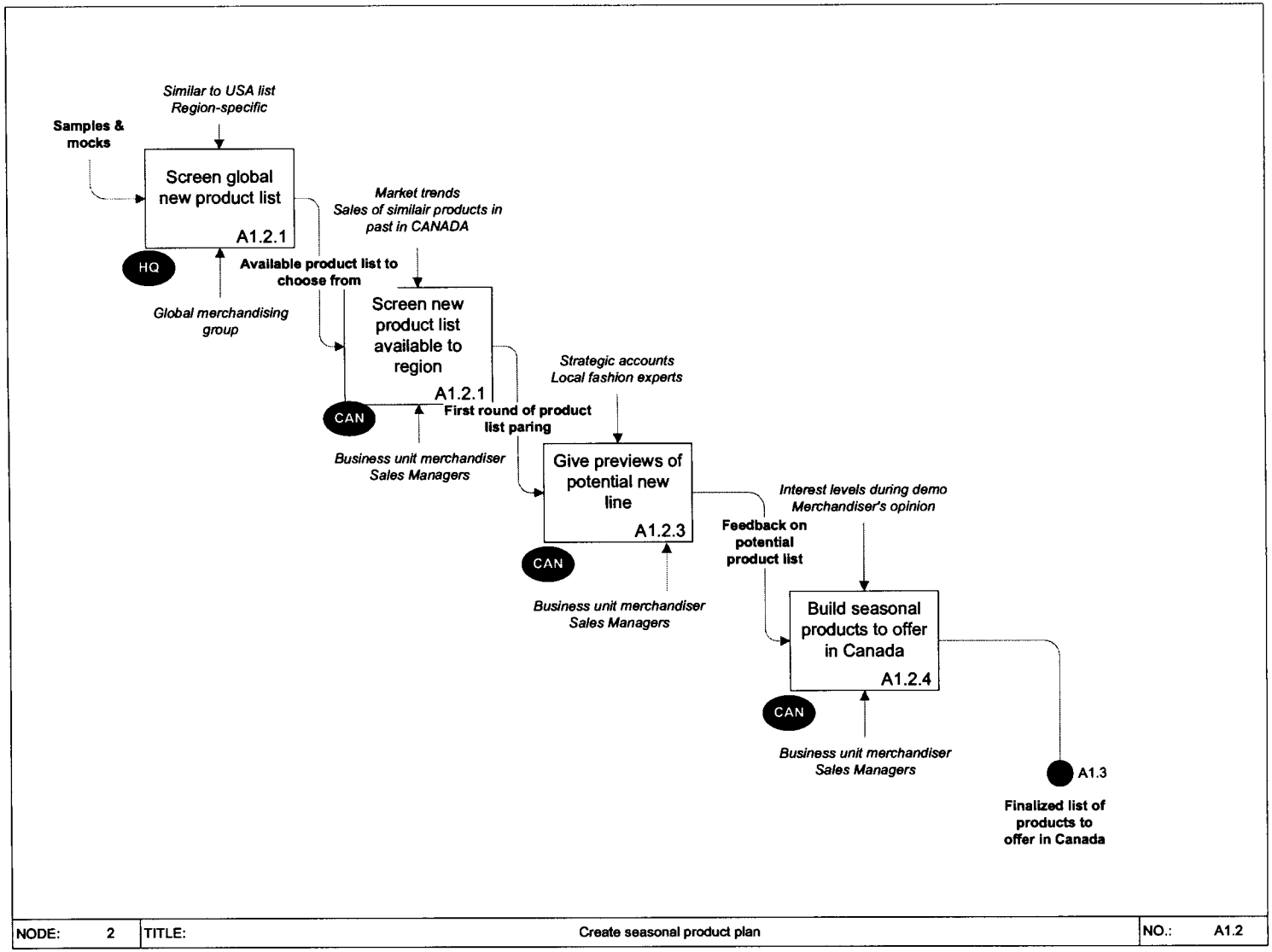


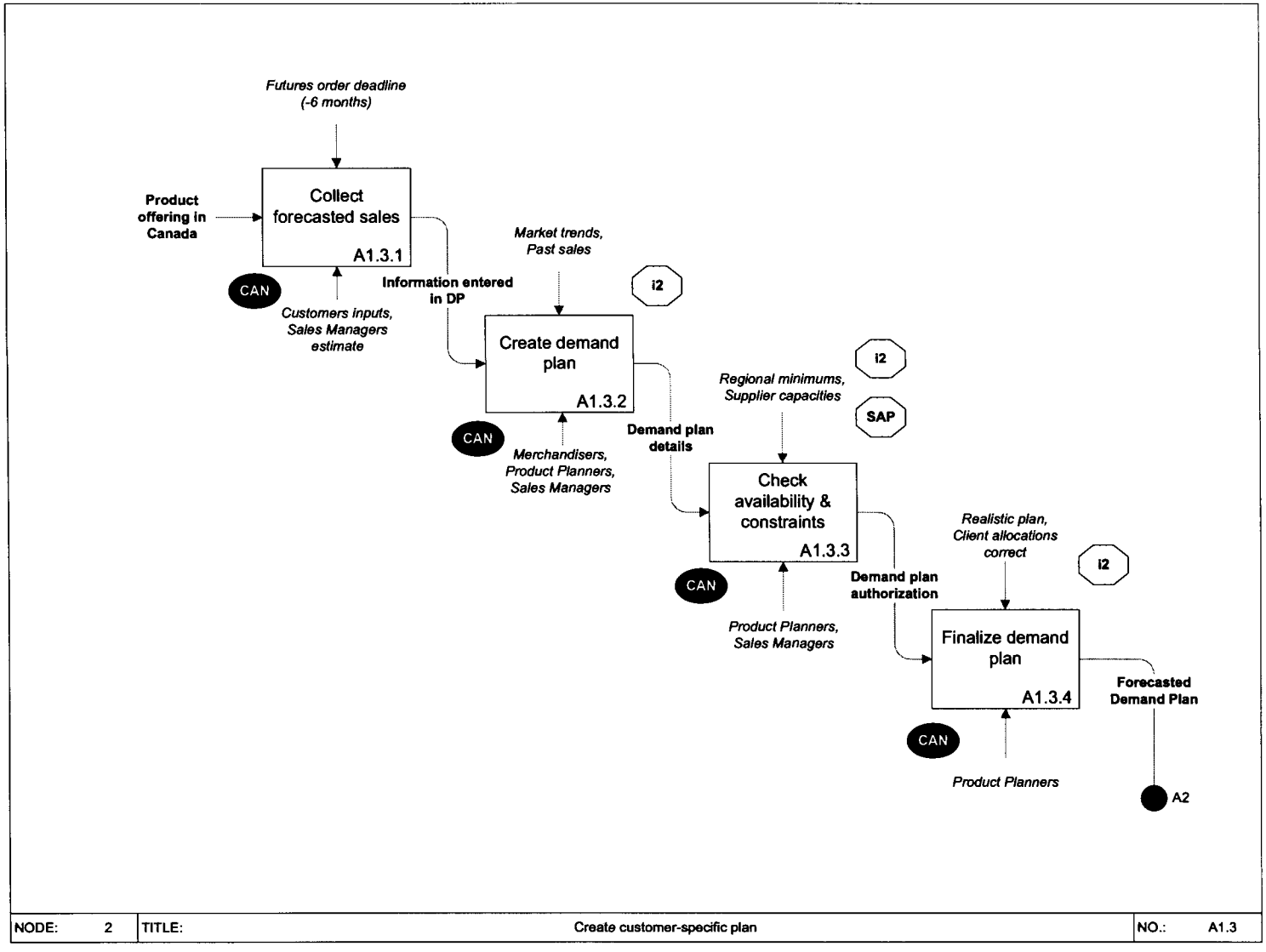
NODE: 0	TITLE: Supply Chain Co-ordination Top-level	NO.:


CRD – 6 months
CRD – 16 to 6 months
Place PO
A0.2
A2
Regional Demand
Designs & Specification
Plan & sell products
A0.1
A1
Divisional Planners
Inventory
CRD – 3 months to 1 week
Sales Team
Order product
A0.3
A3
Customer Demand
Before CRD (not later than CC)
Allocation
Order Managers
Deliver products
A0.4
A4
Before payment terms
Shipped Goods
Distribution Staff
Invoice & get paid
A0.5
A5
Payment
Credit
NODE: 0
TITLE: Supply Chain Context Diagram
NO.: A0

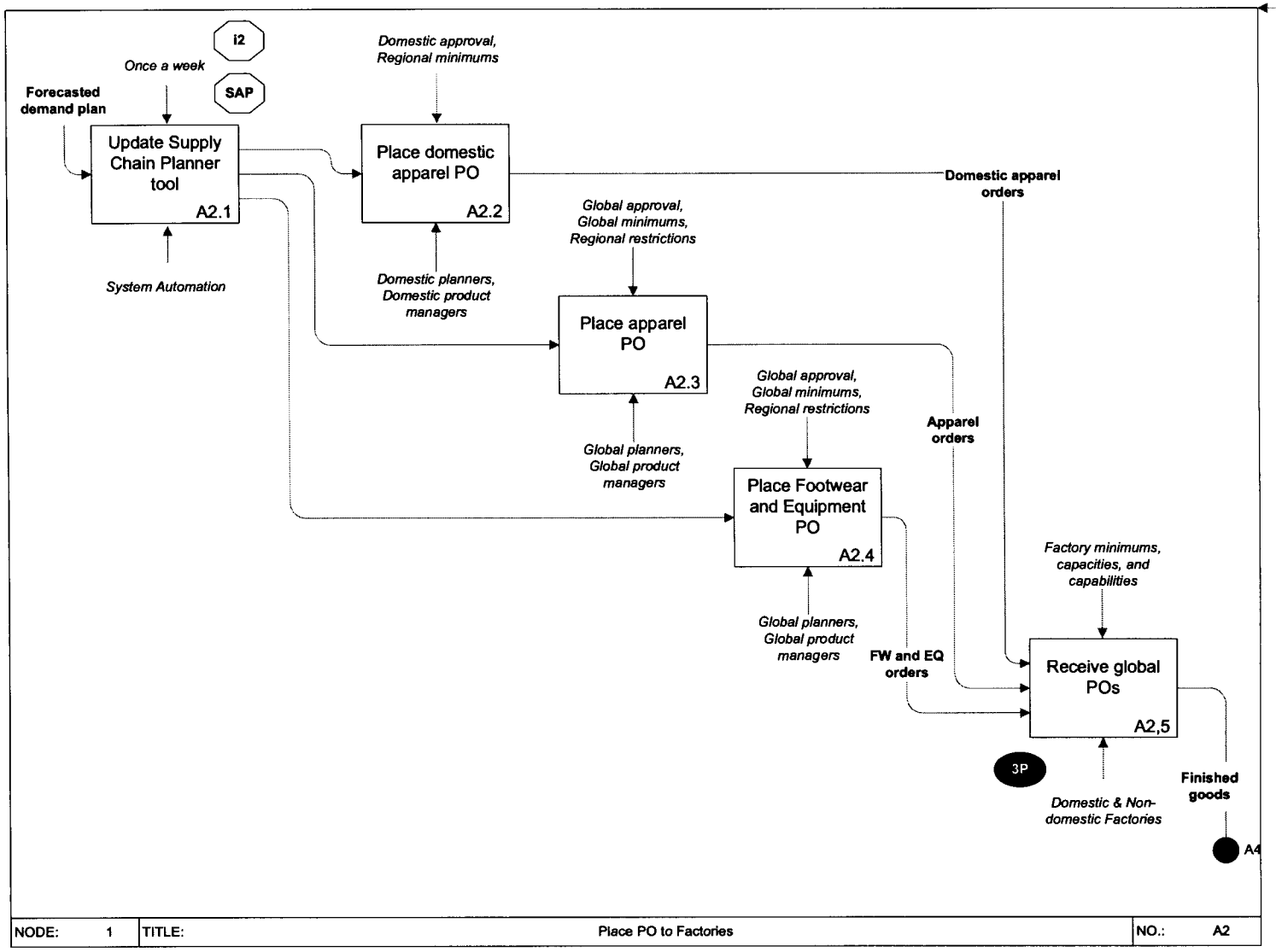

Business Intelligence
Specifications
Develop new line
A1.1
R&D & Designers
Prototypes, Artist Rendition
Marketing Intelligence
Create seasonal product plan
A1.2
Sales Merchandising
Product mix
Customer Intelligence
Begin customer-specific plans
A1.3
Sales
Forecasted demand by:
-Product
-Customer
A2 & A3
NODE: 1
TITLE: Demand Planning
NO.: A1

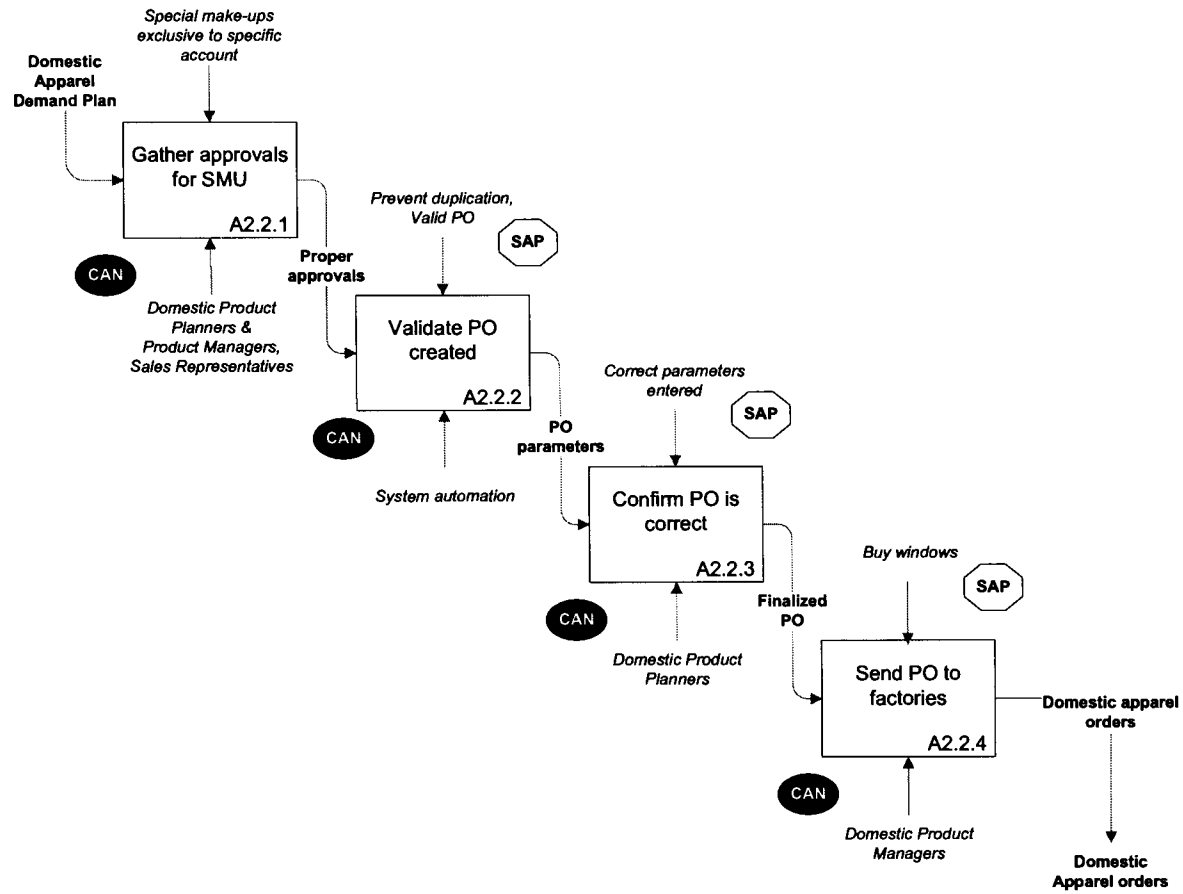

Annual General Meeting
Give corporate direction
A1.1.1
HQ
Board of Directors
Business Intelligence
Corporate Strategy
Performance & Aesthetics
Give design specification
A1.1.2
HQ
Sponsored Athletes
Functional requirements
Durability
Environmental sensitivity
Price sensitivity
Create new materials
A1.1.3
HQ
Materials Innvoation Team
Materials available for designs
Reasonable Price Points
Current Fashion Trends
Create new design
A1.1.4
HQ
Product Innovation team
Functional & Aesthetic requirements
Focus Groups
Sponsored Athletes
Build prototypes or Mocks
Test new designs
A1.1.5
HQ
New product testing labs
Feasability of production
Product designs
Send mocks and/or samples to regions
A1.1.6
3P
Factories
Artists
A1.2
Prototypes or Mocks
NODE: 2
TITLE: Development of new products
NO.: A1.1


Similar to USA list
Region-specific
Samples & mocks
Screen global new product list
A1.2.1
HQ
Global merchandising group
Available product list to choose from
Market trends
Sales of similair products in past in CANADA
Screen new product list available to region
A1.2.1
CAN
Business unit merchandiser
Sales Managers
First round of product list paring
Strategic accounts
Local fashion experts
Give previews of potential new line
A1.2.3
CAN
Business unit merchandiser
Sales Managers
Feedback on potential product list
Interest levels during demo
Merchandiser's opinion
Build seasonal products to offer in Canada
A1.2.4
CAN
Business unit merchandiser
Sales Managers
A1.3
Finalized list of products to offer in Canada
NODE: 2
TITLE: Create seasonal product plan
NO.: A1.2



NODE: 2	TITLE: Create customer-specific plan	NO.: A1.3


i2
SAP
Once a week
Forecasted demand plan
Update Supply Chain Planner tool
A2.1
System Automation
Domestic approval, Regional minimums
Place domestic apparel PO
A2.2
Domestic planners, Domestic product managers
Domestic apparel orders
Global approval, Global minimums, Regional restrictions
Place apparel PO
A2.3
Global planners, Global product managers
Apparel orders
Global approval, Global minimums, Regional restrictions
Place Footwear and Equipment PO
A2.4
Global planners, Global product managers
FW and EQ orders
Factory minimums, capacities, and capabilities
Receive global POs
A2,5
3P
Domestic & Non-domestic Factories
Finished goods
A4
NODE: 1
TITLE: Place PO to Factories
NO.: A2



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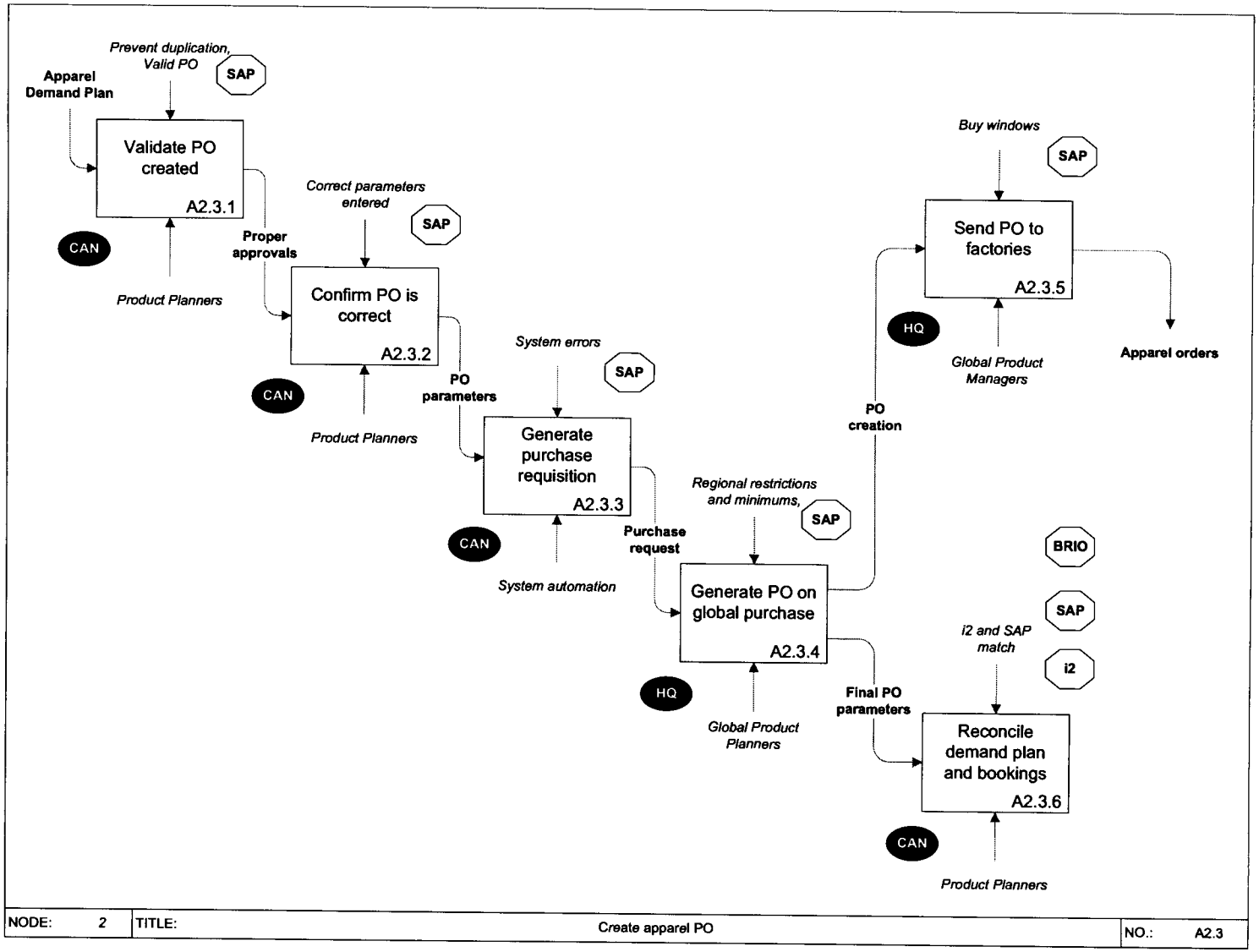
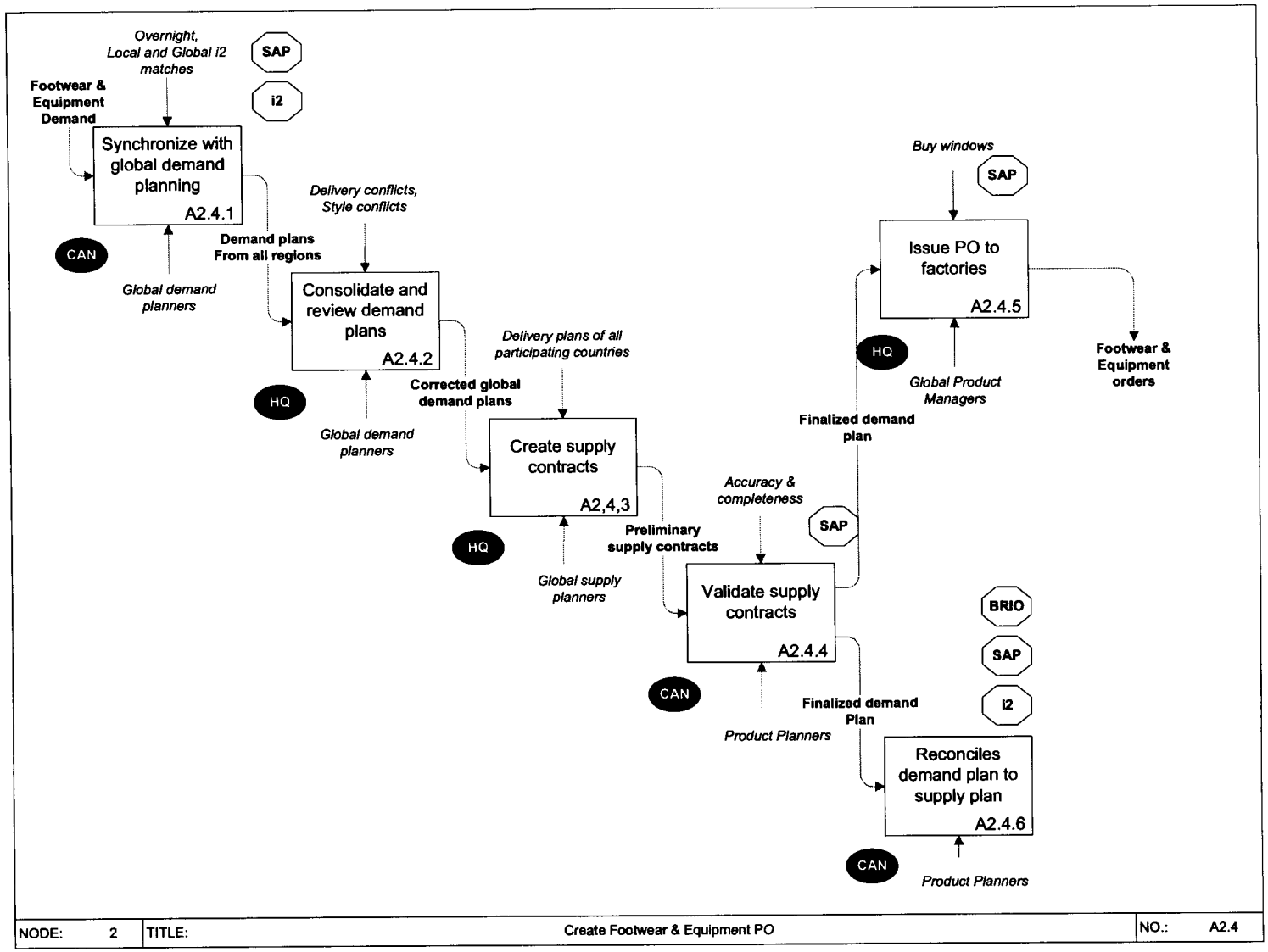
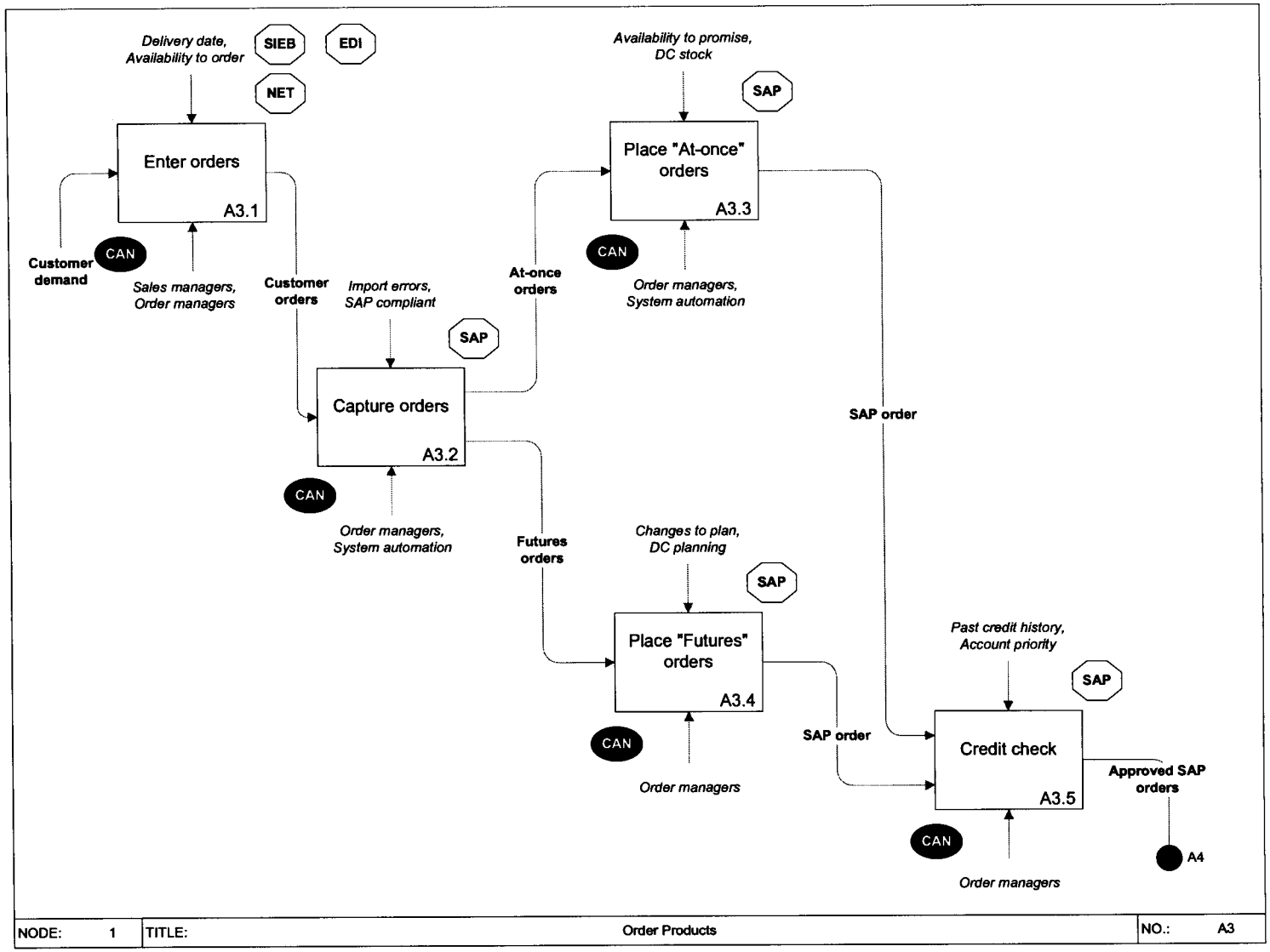
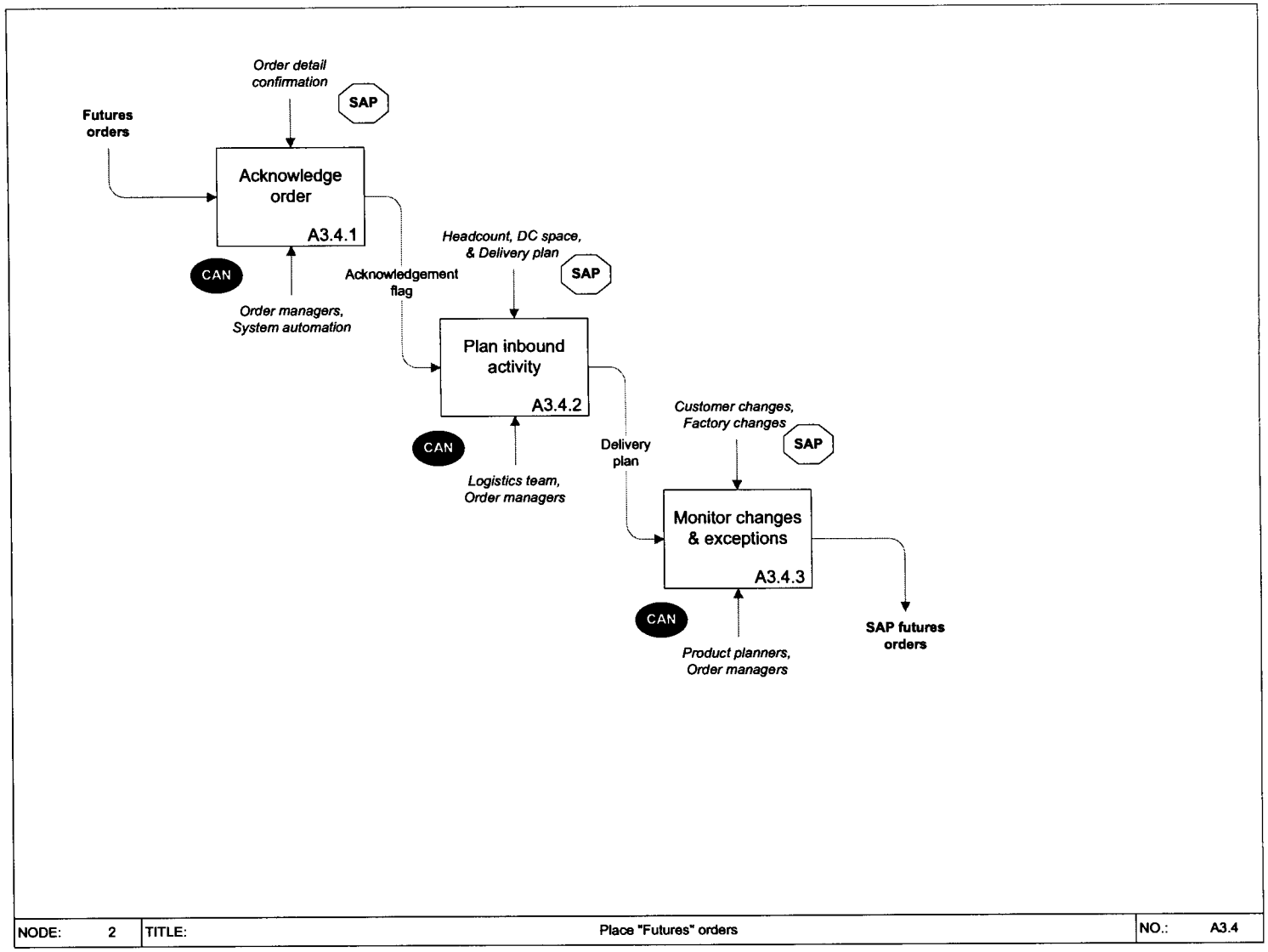
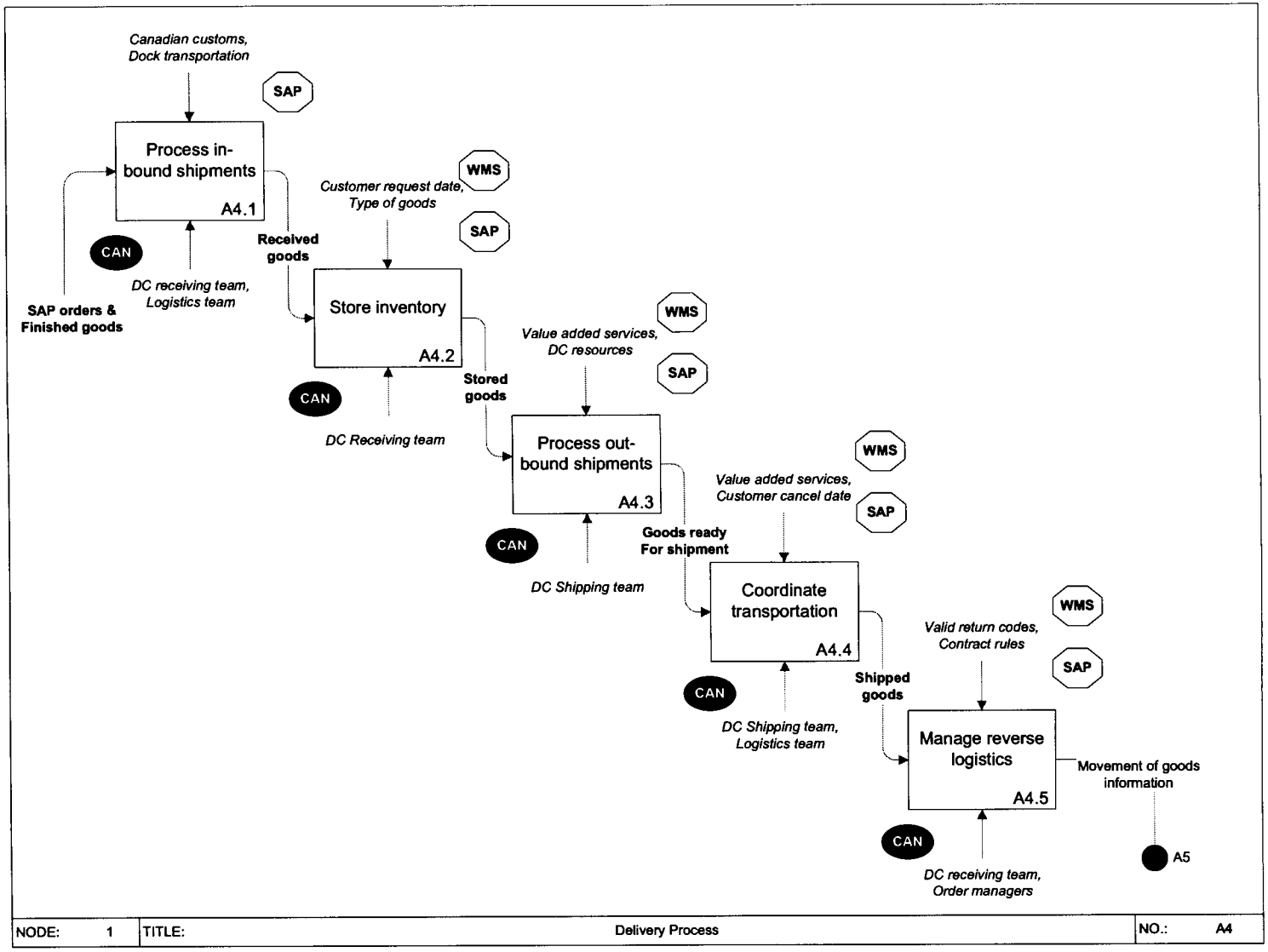
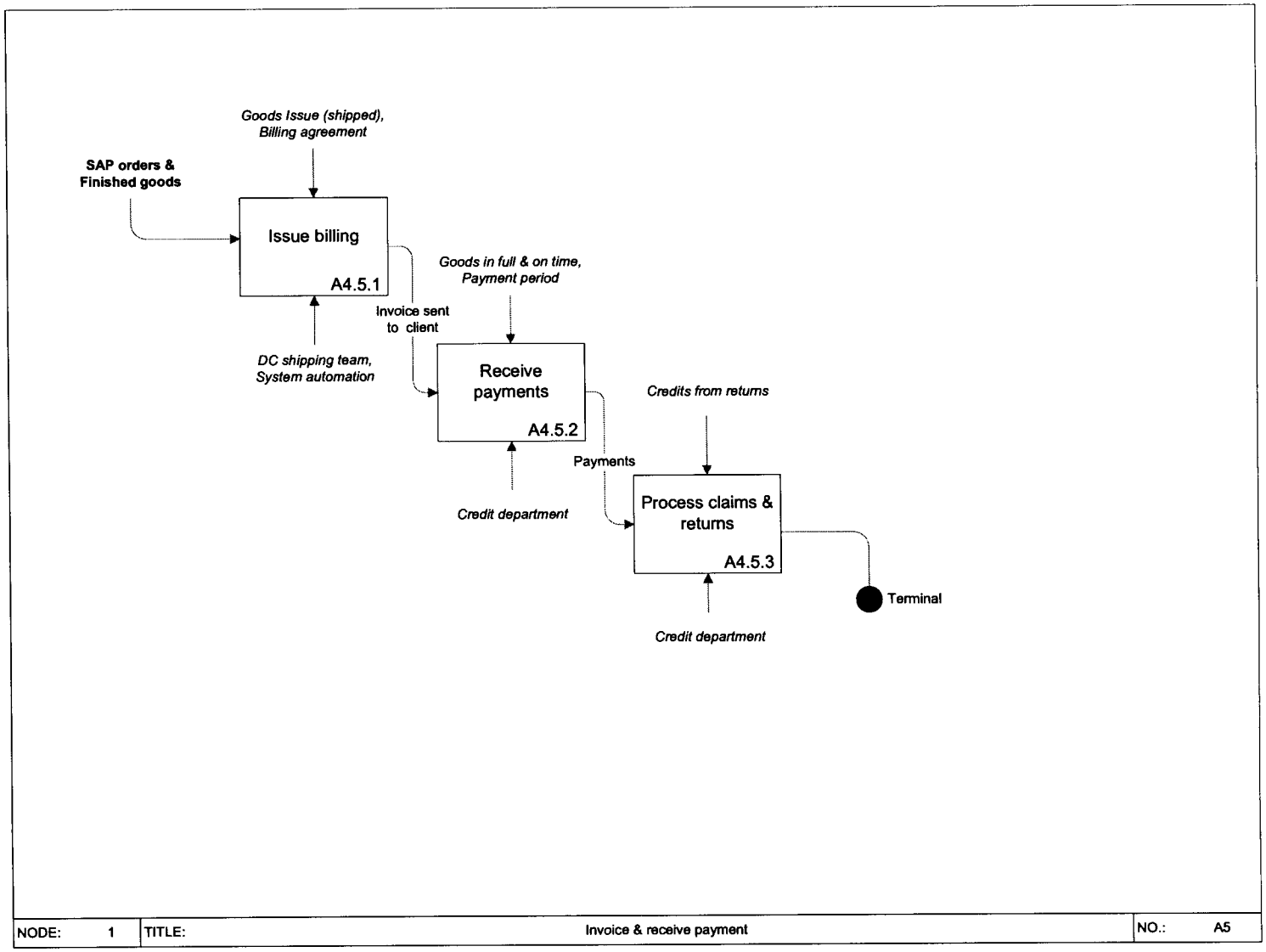

Prevent duplication, Valid PO
SAP
Apparel Demand Plan
Validate PO created
A2.3.1
CAN
Product Planners
Proper approvals
Correct parameters entered
SAP
Confirm PO is correct
A2.3.2
CAN
Product Planners
PO parameters
System errors
SAP
Generate purchase requisition
A2.3.3
CAN
System automation
Purchase request
Regional restrictions and minimums,
SAP
Generate PO on global purchase
A2.3.4
HQ
Global Product Planners
PO creation
Buy windows
SAP
Send PO to factories
A2.3.5
HQ
Global Product Managers
Apparel orders
BRIO
SAP
i2
i2 and SAP match
Final PO parameters
Reconcile demand plan and bookings
A2.3.6
CAN
Product Planners
NODE: 2
TITLE: Create apparel PO
NO.: A2.3


Overnight, Local and Global i2 matches
SAP
i2
Footwear & Equipment Demand
Synchronize with global demand planning
A2.4.1
CAN
Global demand planners
Demand plans From all regions
Delivery conflicts, Style conflicts
Consolidate and review demand plans
A2.4.2
HQ
Global demand planners
Corrected global demand plans
Delivery plans of all participating countries
Create supply contracts
A2,4,3
HQ
Global supply planners
Preliminary supply contracts
Accuracy & completeness
SAP
Validate supply contracts
A2.4.4
CAN
Product Planners
Finalized demand Plan
BRIO
SAP
I2
Reconciles demand plan to supply plan
A2.4.6
CAN
Product Planners
Finalized demand plan
Buy windows
SAP
Issue PO to factories
A2.4.5
HQ
Global Product Managers
Footwear & Equipment orders
NODE: 2
TITLE: Create Footwear & Equipment PO
NO.: A2.4


Delivery date,
Availability to order
SIEB
EDI
NET
Enter orders
A3.1
Customer demand
CAN
Sales managers,
Order managers
Customer orders
Import errors,
SAP compliant
SAP
Capture orders
A3.2
CAN
Order managers,
System automation
At-once orders
Availability to promise,
DC stock
SAP
Place "At-once" orders
A3.3
CAN
Order managers,
System automation
SAP order
Futures orders
Changes to plan,
DC planning
SAP
Place "Futures" orders
A3.4
CAN
Order managers
SAP order
Past credit history,
Account priority
SAP
Credit check
A3.5
CAN
Order managers
Approved SAP orders
A4
NODE: 1
TITLE: Order Products
NO.: A3


Order detail confirmation
SAP
Futures orders
Acknowledge order
A3.4.1
CAN
Order managers, System automation
Acknowledgement flag
Headcount, DC space, & Delivery plan
SAP
Plan inbound activity
A3.4.2
CAN
Logistics team, Order managers
Delivery plan
Customer changes, Factory changes
SAP
Monitor changes & exceptions
A3.4.3
CAN
Product planners, Order managers
SAP futures orders
NODE: 2
TITLE: Place "Futures" orders
NO.: A3.4


Canadian customs,
Dock transportation
SAP
Process in-bound shipments
A4.1
CAN
DC receiving team,
Logistics team
SAP orders &
Finished goods
Received goods
Customer request date,
Type of goods
WMS
SAP
Store inventory
A4.2
CAN
DC Receiving team
Stored goods
Value added services,
DC resources
WMS
SAP
Process out-bound shipments
A4.3
CAN
DC Shipping team
Goods ready
For shipment
Value added services,
Customer cancel date
WMS
SAP
Coordinate transportation
A4.4
CAN
DC Shipping team,
Logistics team
Shipped goods
Valid return codes,
Contract rules
WMS
SAP
Manage reverse logistics
A4.5
CAN
DC receiving team,
Order managers
Movement of goods information
A5
NODE: 1
TITLE: Delivery Process
NO.: A4



NODE: 1	TITLE: Invoice & receive payment	NO.: A5