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ABSTRACT

Established in 1999, ABC is an online wholesaler of building materials, focusing on hardwood and laminate flooring, tile, stone countertop, roofing, and decking. Initial growth within the company was a result of key relationships within their supply chain, ownership of the distribution component of the supply chain, and a proprietary logistics management system (LMS.) The company plans further development of this system, which reduces internal distribution costs as well as freight costs to the customer through optimization of several shipping processes. ABC believes that this system will be a first in the market for such technologies. Additionally, there may be an opportunity to commercialize the system as a separate business venture. Although this may present new opportunities, the company must consider the impact on its core business and competitive advantage. Any new initiative should be carefully analyzed based on a consistent alignment with the company’s cost-leadership strategy.

Keywords: Logistics; E-Commerce; Building Materials; Wholesale; Distribution; Proprietary Technology

Subject Terms: Electronic commerce; Electronic commerce – management; Business logistics; Business logistics automation; Building Materials; Wholesale
To my parents, for their love, encouragement and support
ACKNOWLEDGEMENTS

I would like to express my gratitude to many individuals in my life, without whom I could not have completed my MBA. Dr. Aidan Vining provided immense guidance and support through the completion of this final project, and Dr. Michael Brydon supplied valuable advice and insight. My thanks to my sponsor company for providing the opportunity to undertake this endeavour, particularly to Dan for his time and support and to Jeff and Rob for their inspiration and passion for their business. I also offer my gratitude to Ian Hand for his advice and assistance on this project, and for a wealth of knowledge he imparts in class.

I thoroughly enjoyed the MBA experience; an experience made more rewarding by the staff and instructors at the Segal School of Business. In particular, my thanks to Dr. Michael Parent, Dr. Ed Bukszcz, Dr. Elicia Maine, and Dr. Ian McCarthy for the profound impression that each have had on me. My 2006 MOT class has been a continual source of inspiration. Thanks to all of you, especially to Fredrik Rook and Olafur Kristinsson for their friendship and humour.

My parents have been an endless source of support, and for that I am greatly appreciative. I also offer my thanks to my great friends, particularly to Chris Rands who always keeps me laughing.

Finally, my thanks to Jenny Lees. Your encouragement and understanding helped more than you know, and for that I will always be grateful.
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| **DIY**      | "Do-it-yourself" consumer who purchases building materials for construction and renovations to his/her own house or property |
| **Drayage** | Trucking charge for the pickup and delivery of freight |
| **LMS**     | Logistics Management System, the internal proprietary software developed by ABC. |
| **ROI**     | "Return On Investment" |
| **SKU**     | "Stock Keeping Unit"; the unique identifier of products and/or variants of products |
1 INTRODUCTION

1.1 The Company

“ABC” is an online wholesaler of construction building materials. Established in 1999, the company has developed expertise in logistics management, information technology, and the building materials supply chain. The company primarily targets high-volume purchasers such as other wholesalers and distributors, but also sells extensively to contractors, retail outlets, and individual consumers. ABC is privately owned and has a full-time staff of approximately 40 employees. Sales commenced in the fourth quarter of 2001.

Early growth within ABC consisted of a focus on technology and business development. The company established partner relationships with leading manufacturers as well as major logistics service providers. ABC also developed and implemented an e-commerce platform as well as transportation logistics software. The company focuses on ownership of the distribution component of the supply chain. They perform many functions that traditional wholesalers either contract out or rely upon other firms with the distribution channel to manage.

Based on this model, the company competes by providing a low price to the customer for equivalent products offered by rival firms. Their cost-leadership strategy that enables a low market price is supported in part by the systems the company has developed to achieve efficiencies in shipping logistics.
1.2 Shipping Logistics Management Technologies

For any company in the business of distributing physical goods, effective management of the supply chain is essential. The structure of the supply chain is not necessarily specific to certain industries or companies, as there must be an appropriate fit to the company's overall strategy. Within the supply chain, the specific area of logistics management deals with the activities required for the sourcing and supply of raw materials as well as physical distribution of finished goods to ensure customer satisfaction.\(^1\) The use of information technology has received greater attention in recent years; however most studies consider the overall influence of IT upon the firm's corporate strategy, and limited work has been devoted to its influence upon specific firm functions such as logistics and upon supply chains in general.\(^2\)

As information flow is critical within the supply chain, the development of systems to manage logistics has certainly gained attention from industry. ABC has devoted substantial resources to proprietary systems that manage the order delivery logistics from the manufacturer straight to the customer. The company operates with a sales channel that does not use other distributors or physical warehouses. As a result, ABC believes that its logistics platform significantly supports its cost leadership strategy through cost reductions in truck and container loads as well as shipping routes. The company plans invest further in the development of this system, providing the customer with instantaneous calculations to reduce freight costs through cargo packing algorithms and global land and ocean route analyses. As ABC believes that such a system does not currently exist within the shipping industry, the company sees potential opportunities for this technology beyond internal order management.

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1.3 Purpose and Scope of this Analysis

This project will provide recommendations to ABC on a course of action for the next development phase of a logistics management technology. While there may be an opportunity to market this system to other companies or utilize the technology as a service, the company may lose a certain degree of its competitive advantage. In addition, the resources allocated to such an endeavour may result in a lack of focus for the company on areas of business that have truly made the company successful. An internal and external analysis is performed to provide the framework from which recommendations are developed. In addition, the company’s supply chain is examined to provide the background on logistics; however, the project will not provide recommendations in this regard.
2 THE WHOLESALE BUILDING MATERIALS INDUSTRY

2.1 Definition of the Market

Within the US$3.4 trillion worldwide construction market, ABC competes primarily within North America, which accounts for approximately 80% of its annual sales. Within the sectors that ABC competes, the US flooring market alone is worth approximately US$25 billion. ABC competes in approximately 6% of this market with their product lines. The building materials market consists of all materials used in a residential or commercial building, such as drywall or concrete as well as finished products such as hardwood flooring, tile, and lighting fixtures. As these products range from commodities to highly specialized and differentiated products, the wholesale industry is very diverse and segmented. The result is an industry serviced by material manufacturers through a multi-tiered network of distributors, wholesalers, contractors, subcontractors, and retailers.

The market is intensely competitive and highly fragmented with many building materials wholesalers of various sizes. Sales in building materials are subject to economic cycles such as those experienced by the US housing market.

Within Canada, there are 15 general sectors of wholesale as tracked by Industry and Statistics Canada. Table 1 provides a detailed breakdown of these sectors and the associated sales for 2005. Of the CA$470 billion in wholesale trade, building supplies accounts for 8%, or approximately CA$39 billion.
The well-established traditional structure of the distribution network has changed only slightly within the past few decades. The establishment of mass-merchandisers such as The Home Depot did create a change to the conventional supply chain, focusing on contractors as well as the general consumer market. However, major shifts in the supply chain would require a fundamental change in the relationships that firms have with one-another, either as manufacturers, distributors, wholesalers, or retailers. As a result, there is a high degree of inertia within the industry in terms of a company’s ability to significantly alter the supply chain within which it operates. The importance of relationships within this network often restricts a firm’s flexibility in pursuing a new sales channel.

### 2.2 Trends with Wholesale Building Materials

Activity with the industry is subject to a variety of broad factors, such as the general state of the economy and annual housing starts. The steady increase in US housing starts over the past

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10 years has created a consistent demand for building materials. As shown in Figure 1, there are fluctuations in demand, but overall consistent growth particularly since 2000.

**Figure 1:** US Housing Starts, Thousands (1996-2005)

![Graph showing US Housing Starts, Thousands (1996-2005)](chart)

*Source: US Census Bureau*[^1]

Table 2 lists wholesale merchant sales for Canadian companies by each sector.

---

Table 2: Canada Wholesale Merchants' Sales by Industry, unadjusted (CA$ Millions)

<table>
<thead>
<tr>
<th>Industry</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>All wholesale trade groups</td>
<td>381,483.10</td>
<td>409,927.70</td>
<td>418,810.20</td>
<td>446,210.00</td>
<td>470,347.00</td>
</tr>
<tr>
<td>Farm products</td>
<td>4,568.60</td>
<td>4,723.30</td>
<td>4,759.50</td>
<td>5,104.10</td>
<td>5,548.80</td>
</tr>
<tr>
<td>Food products</td>
<td>72,339.10</td>
<td>76,873.30</td>
<td>78,038.40</td>
<td>78,240.60</td>
<td>79,308.50</td>
</tr>
<tr>
<td>Alcohol and tobacco</td>
<td>7,120.30</td>
<td>6,974.30</td>
<td>7,538.40</td>
<td>7,743.30</td>
<td>7,558.00</td>
</tr>
<tr>
<td>Apparel</td>
<td>8,064.80</td>
<td>8,746.50</td>
<td>9,102.20</td>
<td>8,682.80</td>
<td>10,072.70</td>
</tr>
<tr>
<td>Home and personal products</td>
<td>22,015.60</td>
<td>23,678.10</td>
<td>23,960.60</td>
<td>25,330.90</td>
<td>27,747.60</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>18,744.60</td>
<td>22,531.00</td>
<td>24,829.00</td>
<td>28,551.00</td>
<td>30,205.40</td>
</tr>
<tr>
<td>Motor vehicles</td>
<td>61,602.80</td>
<td>73,643.40</td>
<td>73,235.40</td>
<td>72,902.60</td>
<td>73,074.20</td>
</tr>
<tr>
<td>Motor vehicle parts and accessories</td>
<td>15,003.40</td>
<td>15,690.70</td>
<td>15,462.50</td>
<td>18,268.20</td>
<td>18,499.60</td>
</tr>
<tr>
<td><strong>Building supplies</strong></td>
<td><strong>29,387.60</strong></td>
<td><strong>30,582.50</strong></td>
<td><strong>30,814.80</strong></td>
<td><strong>35,331.40</strong></td>
<td><strong>39,302.50</strong></td>
</tr>
<tr>
<td>Metal products</td>
<td>9,438.70</td>
<td>9,721.40</td>
<td>9,497.80</td>
<td>12,663.90</td>
<td>13,566.20</td>
</tr>
<tr>
<td>Lumber and millwork</td>
<td>9,162.50</td>
<td>10,110.70</td>
<td>10,458.50</td>
<td>12,947.50</td>
<td>13,264.80</td>
</tr>
<tr>
<td>Machinery and equipment</td>
<td>33,703.00</td>
<td>34,102.80</td>
<td>35,108.40</td>
<td>38,925.40</td>
<td>45,240.10</td>
</tr>
<tr>
<td>Computers and other electronic equipment</td>
<td>29,510.90</td>
<td>28,839.00</td>
<td>27,561.60</td>
<td>28,507.60</td>
<td>28,606.30</td>
</tr>
<tr>
<td>Office and professional equipment</td>
<td>20,242.40</td>
<td>20,615.60</td>
<td>19,992.70</td>
<td>20,516.70</td>
<td>21,687.30</td>
</tr>
<tr>
<td>Other products</td>
<td>40,578.70</td>
<td>43,095.20</td>
<td>48,450.30</td>
<td>52,494.00</td>
<td>56,665.10</td>
</tr>
</tbody>
</table>

*Source: Statistics Canada*  

---  

5 Statistics Canada “Wholesale Merchants’ Sales By Industry”  
The consistent demand for building supplies is reflected in sales figures for these products (see Figure 2.) In addition, a steady trend within the same period towards home renovations has further reinforced this demand. Although inflationary costs should be considered when evaluating these figures, sales do not indicate any level of decline.

Figure 2:  Canada Wholesale Trade - Building Supplies, CA$ Millions (2001-2005)

![Bar chart showing sales figures for building supplies from 2001 to 2005.](Source: Statistics Canada)

2.3  E-Commerce and Business-to-Business

The internet has revolutionized many aspects of business and electronic commerce (e-commerce) has emerged as a new mechanism for doing business. E-commerce encompasses any form of business transactions conducted electronically using computer networks. Business can be conducted between two or more organizations, or between an organization and end-consumers. Although different forms of inter-organizational information systems have existed in the past, the Internet is used as the medium for most current e-commerce.

Most e-commerce transactions fall into two main categories: business-to-business (B2B) and business-to-consumer (B2C). Each category is defined by the nature of the relationship as

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6 Statistics Canada “Wholesale Merchants’ Sales By Industry”
shown in Figure 3. Consumer-to-business (C2B) and consumer-to-consumer (C2C) also account for a small but growing component of e-commerce.

Figure 3: The Business/Consumer Relationship Matrix

<table>
<thead>
<tr>
<th>Business</th>
<th>Consumer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B2B</strong></td>
<td><strong>B2C</strong></td>
</tr>
<tr>
<td>Relationship:</td>
<td>Relationship:</td>
</tr>
<tr>
<td>- Most common, all but the last link in the supply chain</td>
<td>- Most common, all but the last link in the supply chain</td>
</tr>
<tr>
<td>E-commerce examples:</td>
<td>E-commerce examples:</td>
</tr>
<tr>
<td>- EDI networks</td>
<td>- Internet retailers (Amazon)</td>
</tr>
<tr>
<td>- ABC sales to businesses</td>
<td>- ABC sales to DIY's</td>
</tr>
<tr>
<td><strong>C2B</strong></td>
<td><strong>C2C</strong></td>
</tr>
<tr>
<td>Relationship:</td>
<td>Relationship:</td>
</tr>
<tr>
<td>- Consumer 'offer,' business responds</td>
<td>- Trading, 'swap' and auction transactions</td>
</tr>
<tr>
<td>E-commerce example:</td>
<td>E-commerce example:</td>
</tr>
<tr>
<td>- Priceline.com</td>
<td>- Ebay</td>
</tr>
</tbody>
</table>

Adapted from Slack et al., (2004)  

B2B e-commerce is mainly concerned with the integration of core business processes to increase efficiency, while B2C concentrates on the retail side, where the businesses are directly selling to the customer through the internet.

The availability of information and retail websites has changed many aspects of consumer buying behaviour. Although media attention tends to focus on retail sales, the vast majority of gains in e-commerce have been the result of increased sales between businesses. In 2004, estimated total online sales were $26.5 billion. Business-to-business (B2B) e-commerce accounted for 75% of this total, or approximately $19.8 billion.  

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The reason behind the discrepancy between B2B and B2C relates to the nature of the business relationship. Retail relationships tend to require greater time commitment on the part of the seller, since most retail buyers are not necessarily knowledgeable in regards to product type, specifications and quality. As a result, retail buyers generally require more maintenance prior to and after a transaction. In B2B relationships, the buyer is often better informed and does not require the same level of education or maintenance as that of a retail buyer. Although this depiction of business and consumer buyers is not true in all situations, this does describe the majority of B2B and B2C transactions. The low maintenance and cost effective nature of B2B transactions has thereby promoted their ability to gain a greater percentage of the e-commerce market.

Wholesale trade occupies a large proportion of the e-commerce market. In 2004, wholesale trade had the highest value of online sales of any industrial sector for the fourth consecutive year. Wholesalers sold an estimated $6.1 billion in goods over the Internet, representing approximately 23% of total online sales. Of this, B2B sales accounted for 84%.9 Wholesalers are also utilizing technology to gain efficiencies in transportation, transaction costs, and inventory management. Although many proponents of e-business had predicted the death of intermediaries such as distributors, the appropriate distribution network is dependant on numerous factors that may be specific to the industry or the company.10 The growth of technological competence that exists within many firms makes B2B sales easier to initiate. Once companies understand the technology they are more likely to use it. In 2004, more than half the firms in wholesale trade and manufacturing in Canada made purchases online, compared with the national average of 42%. Online B2B sales tend to be made by large

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firms that are the leaders of e-commerce and often have a trickle-down effect to their smaller counterparts. In some cases, a large wholesaler or manufacturer will set the bar for their smaller customers or suppliers who are integrated in their supply chain.¹¹

### 2.4 Analysis of the Industry

The analysis of an industry is essential to assess a firm's ability to compete on a sustainable basis. The analysis may have a broad view, or may focus on a specific industry sector within which the firm competes. For the analysis of the wholesale buildings materials industry, Porter's five-forces model is used to evaluate the current state of the industry and assess its attractiveness.¹² This model analyzes an industry by using five forces to determine attractiveness: bargaining power of suppliers, bargaining power of customers, threat of new entrants, threat of substitute products, and the rivalry among competitors.

#### 2.4.1 Overview

In using the Porter's model, various factors will either increase or decrease each force. Figure 4 shows the factors that influence each of the forces affecting the wholesale building materials market. For each factor, a plus sign indicates that the factor adds to the specific force, while a minus sign indicates a decreasing effect on the force.

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Figure 4: Forces Affecting the Wholesale Building Materials Industry

**Threat of New Entrants**

* (+) low capital investment required
* (-) generally low margins on wholesale building materials
* (-) establishing relationships within supply chain
* (-) establishing logistic management systems/processes
* (-) understanding of shipping regulations
* (-) C-TPAT Security Compliance is difficult

**Bargaining Power Of Suppliers (Manufacturers)**

* (-) numerous manufacturers in very fragmented market
* (+) once a brand is established with one manufacturer, can be difficult to switch (quality, consistency risks, etc.)
* (+) manufacturers of well-known brands hold greater influence over purchasers

**Rivalry Among Competitors (Building Materials Wholesalers)**

* (+) many firms in a very fragmented industry
* (+) competition is based on cost leadership OR differentiation
* (+) long supply chain with markups at each stage leaves less room for price variation
* (-) established relationships that wholesalers have with key manufacturers, distributors, and buyers creates risks in bypassing parts of the supply chain

**Bargaining Power Of Customers (Contractors, Distributors, Builders, Retailers, End-consumers)**

* (+) low switching costs for customers
* (+) many wholesale firms from which to choose
* (+) growth in availability to information through the Internet to customers
* (+) flexibility on delivery time
* (+) large retail outlets hold significant influence

**Threat of Substitute Products (Other Building Materials Wholesalers)**

* (+) most building products have some sort of substitute; examples for ABC: hardwood or laminate floor can be substituted with less expensive carpet, linoleum, or other types of flooring.
* (-) many substitute products may only have a cost advantage but not quality

Adapted from Porter (1979)\(^\text{13}\)

2.4.2 Bargaining Power of Manufacturers

The abundance of building materials manufacturers provides little bargaining power for most of these companies. Bargaining power is particularly low for manufacturers producing commodity-like products (i.e. lumber.) Although wholesalers tend to establish proprietary brands

and obtain product from a limited number of suppliers, this does not provide a significant barrier in terms of the ability to switch to another manufacturer. Furthermore, the ease for wholesalers to access other suppliers through the internet, as well as developments in supply chain management technologies has further eroded the manufacturer’s bargaining power. Exceptions may exist in the production of more specialized (differentiated) products that tend to provide greater influence over wholesale firms as supply may be short across the market.

For manufacturers that sell their own well-known proprietary brands, there is an advantage. Wholesalers that have established customers for these brands have little choice but to purchase from these manufacturers. However, for most building materials the proliferation of brands and products on the market makes this situation more of an exception than the rule.

Throughout this industry, relationships are critical. For manufacturers with long-standing relationships with their customers, bargaining power is greater than those without these established networks. Wholesale firms gain a certain comfort level within these relationships. The involvement of family businesses reinforces this, as subsequent generations within the company may continue with the same way of doing business. This creates a very static structure within the industry, and adds a degree of influence for these manufacturers over wholesalers.

2.4.3 Bargaining Power of Customers

Purchasers of wholesale building products consist of building contractors and subcontractors, builders, distributors, retail outlets, and some DIY consumers. These customers hold a significant amount of bargaining power, particularly for those purchasing in high volume. Large contracting firms and retail outlets often demand significant discounts on purchases, which they are often successful in obtaining. This is due to the highly competitive and fragmented wholesale market consisting of an abundance of firms.
Additionally, many of these customers face negligible switching costs between products. Unless the customer is committed to purchasing a certain brand, most building products have numerous brands and quality grades from which customers can choose. The lack of established contract or lock-in for purchases allows customers to switch from one wholesaler to another. This adds to the bargaining power as the customer may decide to switch suppliers while facing only a minor inconvenience.

As with manufacturers, the interaction between customers and wholesalers is also a factor of established relationships. Long-term relationships further entrench the existing network, making significant structural changes less likely. This reduces the bargaining power for those customers if they are hesitant to change wholesalers due to long-standing affiliations.

2.4.4 Threat of Substitute Products

Most building materials, particularly finishing products such as flooring or countertop, compete against substitute products. Carpet or linoleum can substitute for hardwood or laminate flooring. Similarly, granite countertop competes against other materials such as laminates or ceramic tile. As a result there is a significant threat of substitutes, as firms must be aware of this level of competition in addition to that of equivalent products from competing wholesalers. A product line that is either priced too high over substitutes or provides little in added-value will often struggle to sustain sales over the long term. Conversely, if purchases do not view the substitute as an equivalent in value or quality the product would likely compete for a different market segment.

2.4.5 Threat of New Entrants into the Market

The barriers to entry into the wholesale building materials market are low-to-moderate. The initial requirements to enter this market are low in terms of capital investment. Unlike industries that require substantial capital for start-up, such as large-scale manufacturing, a
wholesale operation could enter the industry with a modest financial investment. This factor alone may attract new firms into the market, particularly into certain niche markets requiring only a small operation. For companies wishing to compete on a larger scale, there a certain barriers that new entrants must overcome.

The majority of entry barriers exist in the relationships that firms must establish within the supply chain. A new entrant must have a clear understanding of the targeted customer, seek out suitable suppliers, establish reasonable relationships with those suppliers in terms of product and price, and subsequently convince customers to purchase these products. Based on the significant power held by the customer as previously outlined, establishing these relationships is difficult.

Wholesalers must have significant industry knowledge, expertise in inbound and outbound logistics, procurement, information exchange, and trade regulatory requirements and costs. For existing wholesalers of other products that are entering the building materials market, they may already have experience in some of these areas. For firms that are new to the industry entirely, this type of knowledge can involve a significant amount of research requiring investments of both time and money.

There is often also information system requirements of any company that is significantly involved in wholesale. Electronic data interchange (EDI) is the transfer of information between organizations, often to complete business transactions. EDI transactions may come in such forms as purchase orders, order acknowledgements, requests for quotations, or quotes. EDI provides the ability to standardize and automate the business between organizations. For wholesale firms, utilization of this technology may be essential to deal with other organizations within the

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distribution network. Implementation of such systems can be costly and require training and customization.

One factor that is growing in terms of the barrier it provides to entry is registration with the United States Customs-Trade Partnership Against Terrorism (C-TPAT.) The C-TPAT is a joint government and business initiative to manage security issues surrounding the movement of goods through American borders. The US Customs and Border Protection arm of the Department of Homeland Security administers this program. Businesses can apply for C-TPAT registration, reducing the screening requirements of their imported goods by US Customs. This can reduce both the time and the cost involved in moving shipments into the United States. Shipment hold-ups by Customs are often critical issues for importers. Companies with a reputation for delivery problems will not only face greater shipping costs, but also will likely lose customers that are unable to rely on promised delivery times.

The process to register with C-TPAT is arduous. Importers must provide a comprehensive profile of their own company, as well as of firms with which they have relationships. Companies must develop and implement operational programs that comply with the C-TPAT guidelines, and communicate this information with those within the distribution network. For new entrants into the industry that do not have this registration, the C-TPAT becomes a significant barrier to entry. Firms either will have to face the difficult task of trying to become C-TPAT compliant, or will have to cope with greater difficulties with moving goods through US Customs. For established companies that are registered, this provides a significant advantage.

In terms of the return on investment, the low margins that are associated with the wholesale of most building materials may also prevent new entrants. If companies do not

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anticipate adequate revenues, they may choose not to enter the market all together. Although low profit margins are generally associated with industry attractiveness, they can be actual barriers if initial investors do not foresee a reasonable return.

2.4.6 Rivalry among Competing Wholesale Firms

The fragmented nature of the wholesale building materials industry has created a highly competitive environment. There are many competitors of varying sizes and generally very low margins on sales. This is often an indicator of high competition. Many of the products within the industry are in the mature stage of their life cycle and do not experience significant increases in demand. Firms compete primarily on price; however, firms utilize other factors in attempt to differentiate themselves from competitors. These factors include guarantees of supply, speed of delivery, consistency of product, overall product quality, and additional services to name a few. Costs incurred by customers in switching distributors are quite low, and customers will often switch when they perceive a better value.

The traditional supply chain within the industry consists of distributors, exporters, importers, retail distributors, and others to create several levels of price mark-up. This structure has reinforced the competition between wholesalers as there is little room left for price variation on similar products.

There are three major types of wholesale distributors of building materials in Canada:16

1. Forward integrated suppliers: This group includes organizations that utilize distribution channels for their own products as well as carrying products of other suppliers to supplement their product line.

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16 Maretic, Z. “Strategic Analysis of a Building Materials Distribution Company in Canada” Faculty of Business Administration, Simon Fraser University, p. 15, 1996.
2. Backward integrated retailers: This group of wholesalers operates in order to supply goods to the retail end of their organization. The focus of this group is on efficiency and cost minimization. These companies compete directly with the other two types of wholesalers on the non-commodity products, but tend to leave commodity products to other firms.

3. Independents: This group has no forward or backward links, and survives solely on the ability to offer value to the retail business.

ABC is an independent wholesaler, with no specific ties either backward to a manufacturer or forward to a retailer. The company focuses on providing value to customers on a cost-leadership strategy to enable low prices for the equivalent level of quality. ABC has many competitors due to their ability to be price-competitive and their willingness to sell to any customer able to purchase their minimum order sizes.

1. Direct Competitors

Given ABC’s ownership of a large portion of the supply chain, the company competes with a variety of firms throughout this channel. For example, international exporters buying product from manufacturers are as much competitors as national or regional distributors. This competition extends straight through to retail, as many of ABC’s customers may alternatively buy from traditional bricks-and-mortar outlets. However, across this marketplace some specific firms pose competitive threats given ABC’s e-commerce business model.

“LBL” is a large retailer of hardwood flooring with 50 retail outlets across the United States. The company specializes in flooring, operating with large inventories and utilizing aggressive price promotion. The company has grown significantly over the past five years, with
sales of US$25 million in 2000 to US$170 million in 2005 (forecast).\textsuperscript{17} Although LBL utilizes an internet-based sales model, this acts as only a supplement to the company’s traditional retail business.

"IFR" is an internet based flooring company with established relationships with over 1000 retailers across the United States. Customers can place orders through an online catalogue, and subsequently pick up the orders at one of these retailers. Alternatively, IFR will deliver to a specific location for an additional charge. Although the company may provide convenience to some customers in terms of ease of ordering or delivery, IFR does not offer significant cost savings over competitors. In effect, the company simply adds an additional layer of mark-up to the distribution channel. While IFR does sell to some retail outlets and professional designers, the customer base is primarily DIY consumers.

Other e-commerce firms targeting the building materials industry have existed within recent years; however, most of these either have transitioned into other market sectors or have disappeared through merger or acquisition. Some firms have attempted to establish a similar business model to ABC but have been unsuccessful.

2. Retail Competitors

Well-established building supply retailers certainly provide a high degree of competition with the market. Well-known “big-box” stores such as The Home Depot and Lowe’s have become very successful at establishing a broad customer base that includes many DIY consumers as well as builders and contractors. Of the 45,000 building supply retailers across the United States, The Home Depot and Lowe’s combine for 16.5% share of the market with 2,970 locations.\textsuperscript{18}

\textsuperscript{17} ABC Internal Report, 2006
\textsuperscript{18} ABC Internal Report, 2006
2.5 Attractiveness of the Industry

An analysis of the forces influencing wholesale building materials presents an industry with a low degree of attractiveness. The low profit margins on most products combined with the large number of firms has created a highly competitive environment. Although there is not a significant threat of new firms entering the market, very low profit margins is one indicator of the difficulty that firms have in remaining competitive.

In terms of the relationships that wholesalers have in the market, firms do possess significant bargaining power over manufacturers for the majority of products. This position increases even further moving downstream in the distribution channel, as the wholesalers’ customers have an even stronger bargaining position. The cyclical nature of this industry (as tied to the general economy or housing starts) also adds uncertainty and risk to the industry in general.

To be successful as a wholesaler, firms must provide measurable value to customers and find ways to break through well-established distribution channel relationships in order to increase sales.

2.6 Implications

The high degree of competitiveness and significant bargaining power of downstream members of the supply chain result in an extensive amount of importance placed on relationships within this industry. Changes in the landscape are mostly likely to appear as consolidation between wholesale firms, or as market entrance by firms with established competence the wholesale business.

In terms of the direct implications to ABC, there is currently a minimal threat of rival companies being able to imitate ABC’s business model to match their prices. The conventional distribution channel is well established throughout the industry and does not easily allow for
structural changes between existing members with long-term relationships. However, the consolidation of certain companies as well as the potential for large retailers to invest heavily into an e-commerce business model could present changes to the future landscape of this industry.
3 INTERNAL ANALYSIS OF THE ORGANIZATION

An internal analysis describes the characteristics of an organization based on the processes and resources used to support their overall strategy. The purpose is to “identify the existing and potential sources of sustainable competitive advantage... [as well as] impediments....” The analysis of ABC will comprise of an overview of the firm’s business model, products, customers, sales and marketing initiatives, and an assessment of core competencies. Subsequently, a value chain analysis will identify sources of value through the activities that ABC performs. Finally, the summary will describe the company’s ability to create a competitive advantage.

3.1 Core Competencies

Core competencies are abilities that organizations perform well that allow them access to a wide variety of markets, provide significant value to their customers, and are difficult for competitors to imitate. Since the company’s inception, ABC has effectively developed core competencies in key areas that drive their current success.

ABC has the ability to manage the distribution component of the supply chain in a cost effective way allowing them to compete on price with all rival firms. This ability is built upon their extensive knowledge of the wholesale building materials industry, an understanding of supply chain processes, and expertise in logistics management. In addition, the company’s

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development of a robust technology platform and a dedicated IT staff has helped to enable this capability.

In the specific area of technology, the company also has a core competency in system development and innovation to support their business model. ABC has made a significant investment into proprietary systems that integrate the sales process with logistics management. These systems add significant value to order management and distribution.

Another core competency of ABC is their ability to form relationships with key parties across their business operations. The company formed partnerships with several manufacturers, ensuring product supply and quality to support their brand marketing. ABC also has relationships with shipping firms and other logistics service providers. This provides a reliable distribution network at reasonable rates.

3.2 E-Commerce Business Model for Building Materials Wholesale

Examination of the structure of e-commerce allows for a better understanding of how ABC fits within this model. ABC has developed an e-commerce business model for building materials wholesale. There are four general dimensions that can classify E-commerce applications: linkage, relationship, product offering and price. Assessing the application in terms of these dimensions allows one to recognize and comprehend the interactions and processes involved in the company’s operations.

The first of these, e-commerce linkage, relates to the position of the application in relation to buyers and sellers. ABC follows a transmitter/receiver model, as the seller owns and operates the application. This allows for the company to maintain a tight integration between the

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21. Brydon, M. "BUS 756: Strategic Use of Information and Knowledge" adapted from lecture notes, Simon Fraser University, 2006
website and other internal business units, as opposed to outsourcing the sales process or utilizing a third party or intermediary for certain functions.

In terms of relationship, sales transactions with ABC are semi-structured, as there are loose contractual obligations that are independent from one order to another. Transactions are made through a payment that requires specific customer information; however, each sale is processed on an individual basis rather than on a standing contract or long-term agreement.

The product offering is a physical good, as opposed to informational or to a service offering. Although the e-commerce sales channel provides information and service, the primary goods are the building materials themselves.

Finally, ABC’s price structure clearly uses a fixed cost per unit, rather than other e-commerce models that can utilize subscription or discovered price per unit. Examples of these alternatives include an online newsletter subscription or a bid-price in an internet auction.

ABC’s website follows a very common type of e-commerce used throughout online business; in fact, most online retailers follow this model. The unique component of ABC’s business relates to how this model fits within their value chain. The company feels that they are set apart from their competition based on their ownership of a large portion of the conventional value chain and the way in which they leverage their e-commerce platform and other proprietary technologies.

As customers place orders, shipment begins directly at the manufacturer. The manufacturer may have a certain amount of product on hand to fill the order, or alternatively they produce the goods. Once there is enough to fill the order, the goods are shipped straight to the customer. The trade-off from the customer’s perspective is the delivery time. Unlike conventional distribution systems in which companies can assure quick delivery due to existing
inventory in strategic geographic locations, ABC’s customer orders drive product supply. This model is known as a demand driven supply network ("DDSN.")

This sales channel provides a direct linkage between the manufacturer of building materials and the customer. Unlike many other B2B or B2C relationships, the online component either adds an additional layer to the transaction, or is simply an alternative method of payment or delivery. For example, Indigo Books and Music Inc. operates Chapters bookstores, in addition to the online component of retail sales through www.chapters.ca. Although some modest discounts can be obtained through online purchasing or related reward programs, the consumer does not receive significant savings through purchases made on the website.

ABC bases their cost-leadership strategy primarily on vertical integration through the shipping activities within the supply chain. The company takes ownership of inventory only during shipping, beginning at the manufacturer and ending at the customer’s point of delivery. Customers place orders either through the website or by phone to a sales representative. The company’s intranet system subsequently manages these orders. By effectively managing the distribution and delivery functions while taking modest mark-ups, ABC is able to offer customers savings of 10% to 60% over competitors. The difference will depend on the customer. Other distributors buying from ABC may typically save 10% in comparison to purchases made through other exporters within conventional distribution. Purchases made further downstream within the sales channel, such as bulk purchases made by contractors, may save up to 60%.

Another key to ABC’s business model relates to the size of purchases that customers make and the market segmentation that the company employs. Customers that are primarily targeted are those that purchase in large volume. Purchases are typically several pallets in size, up to multiple cargo containers measuring 20 or 40 feet in length.
3.3 Product Line

ABC’s products are typically not simple low-cost commodities such as drywall or framing materials. The product line consists of hardwood and laminate flooring, tile, stone countertop, roofing, and decking materials. As a volume wholesaler, ABC typically sells product by the pallet or by the cargo container with minimum order amounts. The company has also established its own brands for most products. ABC views its private label branding strategy as a core part of its competitive advantage. The company is able to maintain control of the brand in case new suppliers must be established, while gaining customer familiarity as these brand names are only associated with ABC. Although this strategy continues to develop, the company does still carry some manufacturer brands. In establishing supply, ABC has put significant effort into manufacturer relationships with approximately 50 manufacturers worldwide. As the company and the product line grow, they will continue to expand this network.

3.4 Customers

Since ABC has positioned itself as a discount wholesaler of building products selling primarily in volume, the company characterizes its targeted customers by order size rather than type. As long as orders meet minimum size limits that the company specifies for each product category, the buyer does not have to fall into a certain segment criteria. For example, a DIY customer can place orders to ABC in the same way that a large distributor or retailer would if the order is large enough. As a result, the company has attracted customers of all types that would typically exist within any point in the traditional supply chain.

In addition, ABC customers are generally knowledgeable in terms of product types, specifications, and quality. Since the company can provide product samples upon request, customers such as distributors or contractors can easily familiarize themselves with the products and will generally be low-maintenance buyers. Conversely, retail outlets selling to a DIY will
often spend an extensive amount of time educating and answering questions in relation to the size of the purchase that the customer is making.

Customer service has also been a major focus for ABC in terms of follow-up and satisfaction. As a result, the company has experienced a high number of repeat buyers. Of the over 32,000 customers that ABC has had, 17,000 remain as active clients (a source of revenue within the past 12 months.) The company’s top 50 lifetime clients account for 35% of total lifetime revenue.22

Table 3 provides a comparison of customers for the years 2002, 2003, and 2004 for North American and International markets by total sales. This data also shows the general size of orders in terms of pallet versus cargo container. Additionally, sales are categorized by the type of customer, consisting of contractor, sub-contractor, distributor, retailers, or DIY.

Table 3: ABC Sales by Customer Profile (CA$)

<table>
<thead>
<tr>
<th>Region</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Int'l</td>
<td>N. America</td>
<td>Int'l</td>
</tr>
<tr>
<td>Container</td>
<td>5.38</td>
<td>173.90</td>
<td>138.77</td>
</tr>
<tr>
<td>Pallet</td>
<td>6.39</td>
<td>632.12</td>
<td>125.66</td>
</tr>
<tr>
<td>Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contractor</td>
<td>1.35</td>
<td>32.24</td>
<td>30.41</td>
</tr>
<tr>
<td>Sub-Contractor</td>
<td>2.71</td>
<td>153.14</td>
<td>60.82</td>
</tr>
<tr>
<td>Distributor</td>
<td>5.41</td>
<td>370.77</td>
<td>121.64</td>
</tr>
<tr>
<td>Retailer</td>
<td>1.29</td>
<td>88.66</td>
<td>29.09</td>
</tr>
<tr>
<td>DIY</td>
<td>1</td>
<td>161.20</td>
<td>22.48</td>
</tr>
</tbody>
</table>

Source: ABC Company Information (Figures equally adjusted by multiple to protect confidentiality)23

Table 3 shows substantial increases in sales across all customer types, both internationally and within North America. Figure 5 further emphasizes this trend, showing the substantial increase in sales to other distributors within this period.

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22 ABC Internal Report, 2006
23 ABC Internal Report, 2006
One notable requirement of ABC’s customers is flexibility in delivery time. Since the company does not keep inventory within warehouse facilities, almost all deliveries must come straight from the manufacturing facility. This often consists of international shipping of significant distances, with delivery times of several weeks. ABC customers are generally able to allow for this lead time in order to obtain savings in the purchase price.

### 3.5 Sales and Marketing

ABC employs a dedicated team in both sales and marketing capacities. As the company places a significant amount of importance on service, sales representatives focus on customer satisfaction as a key indicator of success. The amount of repeat customers is a metric used not only to direct marketing efforts, but also to gauge the firm’s ability to meet strategic goals. Table 4 shows the amount of sales to repeat customers from 2003 to 2005. Repeat customers account for a significant amount of sales revenue. This trend has continued to increase over this period.

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24 ABC Internal Report, 2006
ABC makes substantial marketing investments to support its e-commerce business model. The company relies heavily on web-search advertising through keyword bidding on leading search engines and portals such as Google, Yahoo, and MSN. This pay-per-click method of attracting customers to ABC’s website has proven very successful for the company. Statistics on this are tracked regularly and extensively by ABC, and will be used for further market segmentation to access buyers more effectively.

3.6 Current Strategy

The business model developed by ABC supports a cost leadership strategy. Although the company incorporates processes that provide value-added services, the company primarily focuses on operational efficiencies to reduce internal cost. As result, the company utilizes cost leadership to compete on market price to the customer for equivalent products.

Although ABC primarily utilizes a strategy based on cost leadership thereby creating a low market price, the company does not follow all of the conventional attributes of a firm that competes on cost. Traditionally, cost leaders invest little in innovation. These firms tend to either follow proven methods, or become immediate followers behind other firms that tend to innovate. Conversely, ABC has invested heavily into the technology platform that drives its e-commerce sales channel utilizing innovative systems and business processes. The company’s technology investment also extends to web analytics used to track customers visiting the ABC website. Overall, the company’s leadership position on R&D and technology innovation is consistent with their cost-leadership strategy. These systems are targeted at efficiently integrating
their internal supply chain management processes in order to minimize the end price to the customer.

ABC has also developed their own product brands as a part of their corporate strategy. This minimizes the company's reliance on specific manufacturers. Although proprietary brands require a greater initial investment in sales and marketing, the company gains long-term flexibility through the lack of reliance on specific manufacturers.

ABC views their strategy as a price leader of wholesale building materials to be sustainable based on:

- vertical integration within distribution
- proprietary IT systems for efficient distribution management
- product brand ownership
- minimum order sizes

In addition, the lack of physical warehouses and extensive inventory creates an agile distribution network. This provides the ability to react quickly to customer preferences and general market changes.

3.7 Value Chain Analysis

Value chain analysis is a method of evaluating the efficiency of a system. It focuses on the flows of goods or materials within a company, and identifies any cost or differentiation advantages. "A value chain reflects the activities associated with the flow of goods within a business (primary activities), the activities necessary to support that flow (secondary activities)
and links to other businesses, either owned by the focal firm, or owned by other firms.” Most importantly, the value chain analysis assesses system efficiency, identifies points of added-value, and determines how this value translates to competitive advantage. Four steps are used to perform this analysis: identification of relevant elements within the flow of goods, description of associated firm activities, identification of value added by these activities, and an evaluation of firm performance.  

3.7.1 Internal Flow of ABC Products

Since ABC is a wholesaler of goods, a significant portion of the value chain consists of the physical movement of products through the company’s distribution network. The appropriate distribution network achieves a variety of supply chain objectives, ranging from low cost to high responsiveness. As a result, companies in the same industry often select very different distribution networks. ABC handles its distribution management internally, as value chain ownership forms the basis of the company’s business model.

In terms of value chain analysis, the first step identifies the relevant elements with an internal flow of goods diagram. In the case of ABC, this will apply to the physical flow of goods once they leave the manufacturer (at which time they become property of ABC) to when the customer receives them. Figure 6 shows the conventional distribution channel for wholesale building materials.

Conversely, ABC eliminates these external intermediaries within their distribution channel by managing the physical flow of goods to the end customer as shown in Figure 7.

All of the building materials products that move through their supply chain follow the same basic path. ABC takes ownership of the products once they leave the manufacturing facility until arrival at the customer-shipping destination. ABC has no warehouse facilities and holds inventory only while it is in transit.

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29 ABC Internal Report, 2006
30 ABC Internal Report, 2006
Because of the company's demand-driven supply network approach to the sales channel, an analysis is required of the activities occurring as goods move from the shipping point to the destination. As goods flow through the supply chain, the activities performed by the firm are a continual mix of sales, inbound logistics, operations, and outbound logistics. Along with marketing and service, these are primary activities. Tasks supporting the development of organizational infrastructure, human resource management, technology development, and procurement are secondary activities.\footnote{Porter, M. and Millar, V. "How Information Gives You Competitive Advantage" \textit{Harvard Business Review}, Vol. 63, Issue 4, p. 149-174, 1985}

The primary activities consist of the creation of orders from customers, the processing of these orders, and the coordination of shipping and delivery. In addition, other primary activities facilitate order management. For example, marketing activities create brand awareness and bring in clients. Customer service includes the tasks that assure customer satisfaction and often result in repeat orders.

\subsection*{3.7.2 Description of Value Chain Activities}

Figure 8 shows the primary activities performed during the flow of goods through ABC's distribution channel. A customer initiates the movement of goods by placing an order either through the website or directly to a sales representative by phone.
Once a customer has established the type and amount of product, the sales rep creates a request for quote ("RFQ.") This process initiates a freight quote request that ABC’s internal logistics management system then tracks internally. Logistics personnel are responsible for the coordination of the freight quote, which generally consists of email communication to large global shipping companies as well as freight forwarders, shipping brokers, and drayage handlers.

A logistics coordinator reviews the freight quote(s), and will either enter the information into the system directly, or the freight providers will submit the information themselves online. The logistics coordinator will select one or more providers for the final freight quote. Sales submit this final quote back to the customer to complete the order. Order changes are completed if necessary, and upon customer approval, the sales rep creates an invoice and purchase order, and then transfers the information to the logistics management system.

The next set of activities enables the filling of the order and the physical transfer of the products from the manufacturer to the customer. The logistics department within ABC submit the purchase order to the manufacturer. The manufacturer may have some products available on

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32 LMS Technology Development Plan, 2006
hand or may have to produce the goods depending upon the size of the order. Once the goods are packed and ready for shipping, the logistics department coordinates the tasks required to move the goods to the customer.

The overall management of freight shipping can be a very complex set of steps involving extensive coordination. In addition to managing the physical movement, ABC’s logistics personnel must also adhere to a long list of regulations and various charges and duties are paid. These steps constitute a significant difference between ABC and its competitors. Most wholesalers of building products deal primarily with a local or international distributor. Firms most often see the requirements of exporting and importing goods as well as the complexity involved to be outside of their core capabilities. Consequently, firms will most often outsource these functions to freight forwarders, shipping agents, and other third-party logistics providers.

3.7.3 Identification of Value Added

The breakdown of the value chain into discrete activities is often an effective way of identifying what specifically adds value and the resulting source of competitive advantage. Similarly, this analysis can show areas of potential outsourcing if certain functions do not appear to add value. However, in the examination of ABC’s activities within the supply chain, it is very difficult to identify specific activities that add a certain type of value over others. Assumptions may be drawn that certain functions add a cost-based value. Yet, without specific performance metrics in comparison to other firms, value determination on a disaggregated level is difficult.

The value of primary activities for ABC may be in the aggregation and inter-relatedness of these functions. For example, the coordination of the freight movement from the manufacturing facility to the shipping company could be outsourced to a freight forwarder. ABC logistics personnel handle these tasks in coordination with other functions that precede and follow
3.7.4 Evaluation of Supply Chain Performance

Since the movement of goods forms the basis of ABC’s cost-leadership strategy, the company’s ability to compete on market price is an indicator of their supply chain performance. Since their inception, sales have increased dramatically. The company has put significant effort into various marketing initiatives promoting substantial cost savings to customers for products of equal quality. As most of ABC’s customers are educated on the market (i.e. other distributors and contractors,) the price point of their products must compare favourably to rivals in order to attract new customers.

In addition, market evaluations performed by the company indicate that very few (if any) rival firms are able to match ABC’s prices on equivalent products. The vertically integrated approach taken by ABC allows for significant cost savings on distribution in comparison with most competitors. By controlling a greater number of the activities along the value chain, the company is able to eliminate several mark-ups and pass savings to the customer. Furthermore, the internalization of the tasks reduces transaction costs that the company would incur in addition to intermediary mark-ups. Rather than spending time and money on business dealings with external parties, ABC can focus on their own value chain management efficiency.

3.8 Assessment of ABC’s IT Assets

There are many ways that IT can be examined in terms of assessing the value provided to a firm. The overall goal is to develop an infrastructure that supports the company’s ability to achieve its objectives. For a company attempting to gain a competitive advantage from IT, Ross et al (1996) argue that competitiveness relies upon “the ability to control IT-related costs, deliver
systems when needed, and affect business objectives through IT implementations."33

Furthermore, a framework for evaluating IT assets looks at the competency of IT human resources, the reusability of the technology base, and the strength of relationships between IT staff and management.34 In terms of ABC’s IT assets, each is examined to develop an understanding of the company’s strengths and weaknesses within IT. Subsequently, potential competitive advantage is described based on the sum of all internal characteristics.

3.8.1 Human Resources

ABC has clearly built an IT staff with strong technical knowledge lead by managers with an understanding of the business requirements associated with building materials wholesale. The company has developed and implemented in-house systems that not only successfully support operations, but have also attracted attention from some prominent technology giants that have profiled ABC’s systems. While possessing technical expertise, a strong IT staff should also be involved directly with customers to gain first-hand knowledge of their needs. This is one area on which the company may need to focus, as most IT personnel work independently or within internal groups, with minimal interaction directly with customers. The company could also explore the creation of cross-functional teams from various business units to further support internal information exchange.

3.8.2 Technology Base

The technology base at ABC has a well-defined architecture that has been carefully designed for performance and integration across applications. This has been achieved through a focus on standards and on benchmarking, ensuring that applications meet the day-to-day needs of all internal business units as well as those of customers. Standards will continue to play a

prominent role in development as the company looks to expand information system linkages with external organizations. ABC also monitors hardware systems on a regular basis, and continually upgrades as needed.

3.8.3 Relationships between IT Staff and Management

ABC has created strong relationships between senior management and IT staff, enabled partially by management’s own expertise in IT and belief in the role that technology will play in the company’s success. ABC’s CEO and other managers have direct involvement in system initiatives, including the LMS project that is seen a strategically important to the company. Investment in IT is well funded, and decisions on investment are made in consultation and partnership as opposed to simple sign-off based strictly on IT staff advice.

3.9 Competitive Advantage

Analysis of the value chain provides evidence of ABC’s strategy to compete on price. Ownership of the entire distribution channel in comparison to conventional wholesalers eliminates several layers of price mark-up. The price offered to customers reflects this difference. In addition, internalization of the shipping management and logistics tasks creates a level of direct knowledge for employees that can translate into the efficient integration of related business processes. Such internalization is supported by strong IT assets in human resources, technology base, and internal relationships. This creates a greater learning curve for rival firms trying to compete with ABC, and decreases a rivals ability to imitate the business model or technology platform. Furthermore, the growth of the company through increased sales and continual order processing can create economies of scale. Efficiencies can be gained in the order processing that do not exist for new entrants into this market that are managing much fewer orders.

Market analysis performed by the company suggests the price difference passed on to customers. Figure 9 shows the traditional sales channel for building materials wholesale. The
typical layers of mark-up charged at each stage of distribution results in a significant price difference to the customer in comparison to the manufacturers cost.

Figure 9: Traditional Building Materials Sales Channel

![Figure 9: Traditional Building Materials Sales Channel](image)

Source: ABC Company Information

In contrast, ABC’s sales channel shown in Figure 10 illustrates the savings potential for each type of customer.

Figure 10: ABC Sales Channel

![Figure 10: ABC Sales Channel](image)

Source: ABC Company Information

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35 ABC Internal Report, 2006
36 ABC Internal Report, 2006
The potential for a competitive advantage for ABC over rivals is evident based on this information. As part of the company’s strategy to sustain this advantage, investment is planned for greater logistics management functionality. Further analysis on this strategy is now required, in terms of logistics management technologies and the ability to leverage this system to further support ABC’s competitive position.
4 ANALYSIS OF SHIPPING LOGISTICS MANAGEMENT TECHNOLOGIES

The analysis of a technology should outline the objectives the company hopes to achieve as well as the potential impact on competitive advantage. The technology should support a company's overall strategy and provide the infrastructure to improve operational effectiveness and efficiency. For ABC's Logistics Management System (LMS,) the analysis comprises of an outline of the industry drivers, details of functionality and technological innovations, and a breakdown of the effect on ABC's position within the industry.

4.1 Background on Logistics Management Systems

Logistics can be defined as "an extension of physical distribution management, and usually refers to the management of materials and information flow from a business down through a distribution channel." Although the logistics component of supply chain management is critical to effective distribution, historically firms have focussed more on inventory. Companies kept inventory at strategic points in relation to the location of the manufacturer and the location of the customer. Companies would choose these points to satisfy the needs of particular links in the supply chain. Although apparent efficiencies existed at specific points, overall network efficiency was lacking.

A logistics management system utilizes IT to integrate the functions, flows, and data involved in the movement of goods downstream within the distribution channel. Not only do these systems store information about orders, payments, and shipping, but they also support such

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functions as customs clearance, cargo packing and routing, fee and permit administration, as well as the exchange of information required for security clearance.

4.1.1 Business Drivers

As industries and relationships become more global in nature, complexity increases in the downstream movement of goods. Additionally, the transfer of information becomes as important as the physical goods themselves. The systems used to manage distribution have grown in both size and importance, and industries have emerged that focus solely on supply chain management and logistics.

Despite this growth and recognition by the business world, "there is limited academic investigation on how and why information technology can create performance gains for firms in a supply chain management context." The importance of IT within supply chain management is well accepted; however, the theoretical and empirical research on this integration has been predominantly done on a piecemeal basis.

Logistics management starts with a clear understanding of customer needs. Firms that compete strictly on cost will focus their logistics on areas that will achieve a cost-leadership position. This will result in value to the customer in terms of purchase price but at the expense of other factors such as delivery time. For example, if a company can compete on cost because they buy in large quantities, often the trade off is a long delivery time. Conversely, firms that compete on factors other than cost may utilize a logistics management system to achieve much different goals. For instance, if a company competes based on differentiation, their goal would be to maximize responsiveness, allowing them to adapt quickly to changes in market preferences.

However, the development of management systems must coincide with the firm’s overall corporate strategy. The effective use of IT and logistics management systems specifically requires an alignment between the firm’s goals and the technical infrastructure that is used to achieve these goals in order to be successful.

4.1.2 Technology Drivers

In terms of technology, the internet has had an enormous effect on logistics management. Businesses are able to access and transfer information in a much easier and more efficient way than ever before. This information may be as simple as customs information, available shipping companies, or port fees. The ability to quickly exchange information in such a cost effective manner has transformed the industry. This change has also had direct benefits to the customer as their schedules can revolve around product arrival dates.

The development of information systems to manage logistics originally began with the evolution of electronic data exchange (EDI). The traditional architecture of EDI required a valued-added network (VAN.) The VAN provided the network and translation services necessary to EDI, converting the data from one system to another. This service was expensive and cost-prohibitive for small and medium sized firms. As a result, few small or midsized firms made this investment.

However, the emergence of the internet has enabled many more firms to utilize EDI. Extensible mark-up language (XML) and virtual private networks (VPN) have enabled this movement, making the process of implementing EDI more economical. XML is a web language similar to hypertext mark-up language (HTML.) HTML has become the standard for web page development, while XML allows for the support of a much wider variety of applications using tags that communicate specific meaning. Different companies and individuals within the

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distribution network can easily exchange information in an automated fashion based on established standards. As a result, there is a greater use of EDI in supply chain management.

Other technologies that have facilitated the use of IT within the supply chain are relational databases, bar-coding, email, and wireless communication. While relational databases have been around for many years, cost reductions enable smaller firms to utilize this technology. Although bar-coding is well established, the ability to integrate this technology with other applications has greatly improved the management of shipping. As with many industries, email and wireless communications have also facilitated the management of information.

The next evolution in logistics management technologies may be in the form of radio frequency identification (RFID.) RFID consists of the identification of small chips using radio waves. With the advance of this technology and the resulting reduction in costs, RFID could become the standard method of tracking products either in transit or in inventory. Furthermore, the integration of RFID with other logistics systems only furthers the potential capability of real-time tracking around the world.

4.1.3 Current Solutions on the Market

There are many systems available on the market for general supply chain management and logistics. The cost and functionality varies, depending upon the requirements of the customer and the size of the firm. Some providers specialize in specific industries; others market their products as complete corporate enterprise solutions. Many of the larger applications tie into other enterprise systems such as customer relationship management (CRM) or enterprise resource planning (ERP.) Some firms will also build in-house solutions, depending upon their internal level of expertise.
The right solution for any company must be selected based on a careful analysis of the requirements of the system, the users, the needs of the customers, and the appropriate match with the company's strategic position. This must also fit with the corporate plan for appropriate overall investment into IT.

4.2 ABC's Logistics Management System

The development of logistics management technologies has been a top priority for ABC, as the company feels that this system represents a key differentiator over competitors. The system manages a sales channel that eliminates the need for distribution warehouses and allows the company to fill customer orders based on a "rolling inventory." This system calculates the total cost of delivery for single or multiple orders to any client-specified location in the US or Canada. Shipments to other worldwide locations are delivered to ports for customer pickup.

This system implementation plan consists of two main phases: trucking shipments and ocean shipments. The company has successfully implemented the first phase of this project. The second phase of ocean logistics management is currently in development.

4.2.1 Objectives

In developing the Logistics Management System there are several goals that the company hopes to achieve. This technology is designed to gain internal efficiencies through the integration of internet sales, internal intranet management systems, back-end accounting, and third-party shipping services providers. Implementation of this system should provide value to both the company and the customer by reducing the costs incurred by both. Additionally, the system will conform to a current international standard of best practices in logistics services, as well as meet or exceed for C-TPAT and Canada Smart Border Certification guidelines.
Once implemented, the system will manage the complete end-to-end shipment of goods from the manufacturer to the customer. The second phase (ocean logistics) component will integrate directly with the existing ground transportation module.

The system will automate many of the tasks performed for order processing. The current process for ocean shipping management involves email and phone communication as well as the use of various documents, spreadsheets, and paper files. A fully automated system will eliminate many tasks currently handled manually. This will reduce the internal costs of order management to the company while freeing up personnel to work on less menial and time-consuming tasks.

A result of the manual tasks within the order management process is a certain level of inherent error. While the knowledge gained by internal staff may decrease this error rate, it will never be eliminated completely. The use of phone or email communication along with manual documentation will always introduce error to some degree. An automated system will certainly minimize the occurrence of these errors, providing better information both internally and to customers while building confidence of all parties in the entire process.

Development will include the construction of a comprehensive database of shipping information. This will include rate calculation information from shipping companies as well as third-party logistics providers. This database will enable ABC to perform instantaneous calculations of shipping costs, as opposed to submitting quotes to these parties through email or by phone. The current process involves a lag time in the availability of the information back to the customer. Instantaneous freight calculation will provide the customer with accurate total costs through the website as soon as the customer requests this information. These calculations are possible for deliveries anywhere around the world.

Shipment data transferred to and from information-providers will utilize XML format. This will allow for automated, real-time links between any parties within the distribution
network. This is based on ABC working with distribution partners to establish standard protocols for the communication of relevant information.

The establishment of the LMS database in conjunction with this communication network could allow for the company to create automated linkages to information provided at all stages of the shipping process. This could ultimately eliminate the use of many third-party logistics providers. Where necessary, ABC currently utilizes such services as freight forwarding for the movement of goods between certain points.

In addition to reducing the internal costs of order processing, the LMS technology reduces the total shipping price incurred by the customer. The system improves the space usage of cargo containers, as well as using shipping route selection to reduce the cost of moving the goods from the manufacturer to the wholesaler. Although the objective would be to optimize both of these components, algorithms designed to perform such calculations are difficult to design and encounter exponential levels of calculations. Realistically, such systems will rarely provide an "optimal solution," and will therefore attempt to calculate a "best solution" to a simplified version of the problem based pre-determined design assumptions.

The customer receives value not only in a reduced price, but also by the information provided. The implementation of the LMS system and integration with other systems will enable customers to receive real-time shipment tracking and status reports. This is an essential component, as the maturing of the internet and technology in general creates a market demanding instantaneous information. The ability to provide this information in a user-friendly way provides a definite advantage over competing wholesale firms that lack the equivalent technology.

In addition to the immediate benefits that the LMS technology should provide, this system is also an essential component for the company in the future. Continued growth in sales and product lines will add further complexity to the ABC's logistics management. The company
will have to coordinate with more manufacturers and deliver to more customers around the world. The establishment of a solid platform in order management integrated with existing IT systems will allow for this growth.

4.2.2 Current Processes

Currently, customers place orders either through the website or directly to sales representatives by phone. Online orders are created through typical web-store processes of creating a shopping cart of selected products based on type and order amount. Once the customer is satisfied with the shopping cart items, a checkout page allows for a request for quotation (RFQ.) Orders placed by phone result in an internal worksheet version of the shopping cart order. The salesperson then creates a request for quotation. RFQs are confirmed by a salesperson, whether the order was placed by phone or through the internet. An important step at this point is for the salesperson to ensure that each order is broken down by cargo container so that there is only one quote created per container.

The salesperson submits the quote into the LMS system. The logistics department receives notification at which time an analyst coordinates the freight quote. This consists of the manual process of coordinating with shipping companies, freight forwarders, brokers, and drayage companies. These parties return quote information back to ABC, at which time the LMS database is updated. The Logistics personnel will select the best combination of services required to move the goods to the customer and configure these selections within the system. Additionally, any other application charges are applied such as fees and/or permits.

Once the logistics department has completed the freight quote information, the salesperson is notified who then finalizes the quote and notifies the customer. If the customer agrees to the final price, the system generates an invoice for the customer and a purchase order to
submit to the manufacturer. As the order is filled, the salesperson updates the system with order status information until the product is packed and shipped to the customer.

4.2.3 Technological Innovations

To create efficiencies in order processing, the LMS system incorporates innovations developed by ABC in logistics and information technology. Among supply chain management technologies on the market, there are currently no systems that perform the functions required by ABC to reduce the ocean and ground shipping costs incurred by both the company and the customer. Additionally, this technology must integrate with existing financial and operational systems as well as have the capacity to link to external parties within the distribution network.

The first component within phase two of LMS maximizes the use of space within a cargo container. Currently, ABC processes container-sized orders by simply calculating the space required based on the amount of product requested by the customer. This calculation uses volume and weight limits that exist for each type of cargo container. ABC’s products are shipped in 20 and 40-foot containers, each with respective weight limits. Since the cost for shipping is based primarily on a charge per container, those containers that are only partially full require the same freight charge as full containers.

This presents two potential scenarios in terms of product amount shipped in relation to container usage. If a packing container has enough room to fit more products, the customer can increase the size of the purchase order. Similarly, if more than one container is required for an order, and last container packed holds only a minimal amount of product, the customer would be given the option to slightly reduce the size of the order.

This container usage functionality is performed through packing algorithms. Although the concept is very simple, a significant amount of complexity exists in the implementation of this
into the order processing system. These algorithms must account for the combination of almost all of ABC’s products, each with their own volume and weight. For instance, a customer may place an order containing laminate flooring, bamboo flooring, and tile. Based on the dimensions of the SKU’s and requested amount for each, the system must instantly calculate the amount of space required within the cargo container (see Figure 11.) The weight must also be calculated, as the weight restriction of each container must be applied.

Figure 11: Shipping Container Usage

![Standard 20' Cargo Container](image)

*Source: ABC Company Information*

The next significant innovation within the logistics management system is the shipping route selection. This applies primarily to products traveling by a combination of ocean and overland transport. ABC currently has manufacturers in several countries around the world, and ships to any location within North America and any major port outside of North America. For deliveries traveling from an overseas manufacturer, there may be more than one port city from which the shipment may depart. Similarly, within the destination country, there may be several ports at which the shipment could arrive. Subsequently, the ground shipping may be on truck or rail, depending upon the distance that must be traveled. The resulting route from the

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41 LMS Technology Development Plan, 2006
manufacturer to any given customer location is not set, and shipping could follow one of several potential routes as shown in Figure 12.

**Figure 12: Transportation Routing Schematic**

Source: ABC Company Information

Each of the potential routes has associated costs. Different ports across various jurisdictions have different fees and regulations. The distance traveled from one port to another will affect price, as will the distance and mode of transportation traveled from the inbound port to the customer location.

Once the shipment arrives at an inbound port in North America, the route to the customer may also depend on the weight of the container. Different provinces and states have different restrictions on the maximum weight allowed for truck transport. The carrier may apply for an overweight permit, but this must be arranged and accounted for.

There are also externalities that will affect shipping outside of standard fees and regulatory requirements. For example, labour disputes at a particular port could effect the shipment. Other factors such as weather or fuel costs would also alter the final price. These are factors that will be incorporated into the system, although some of these will be developed at a future time.

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42 LMS Technology Development Plan, 2006
In terms of the end cost to the customer, all of these variables will affect shipping. The LMS system will therefore have a module that will calculate the lowest shipping price based on the necessary calculations. The development of the system will include the population of a database with the relevant information, as well as the capability to link directly with external parties where required.

4.3 Strategic Analysis of the LMS System

The strategic analysis of a technology within an organization presents an indication of the fit between that system and the overall corporate goals and direction. Development within IT should have specific objectives, and those objectives must provide decision-making support to managers. To analyze the LMS system developed by ABC, a framework should be used that will clearly demonstrate the ability of the technology to support the firm’s competitive position. The company’s strategy must be understood, as should the current view of how the LMS system is intended to further this strategy.

4.3.1 ABC’s Strategy to Utilize LMS

ABC believes that an investment in a proprietary logistics management system will strengthen their cost-leadership strategy, which in turn translates to significant savings to customers through shipping cost reductions. Furthermore, as the company believes that the functionality being developed does not exist within any other technology on the market, further opportunities may exist beyond internal order-management. These opportunities may be in the form of a shipping logistics service to other firms or as a stand-alone technology product. Before these options are considered, the system must be examined to determine the potential impact on the company and their place within the wholesale building materials market.
4.3.2 Methodology

Porter (1983) presents a framework for determining the optimal strategy for the development and use of IT within a firm.\(^43\) This framework builds upon the five forces model for industry analysis, and applies these concepts to the internal use of technology.\(^44\) As this model was the basis for the industry analysis presented previously, the foundation exists to extend the analysis to ABC’s internal operations. The analysis framework will be applied to ABC’s LMS system to propose an appropriate strategy for technology investment, and evaluate the company’s current strategy based within this context.

Within most of the research thus far, the studies of competitiveness and of technological innovation are often done independently. As a result, there is a lack of a “comprehensive view of how technological change can affect the rules of competition, and the way in which technology can be at the foundation of creating defensible competitive strategies for firms.”\(^45\) Although the framework that will be applied was developed prior to the evolution of the internet, e-commerce, and other more recent developments in business technology, it does provide an effective tool for the analysis of the alignment between the firm’s IT investment and competitive strategy.

This framework evaluates the amount that technology can alter the structure of an industry. Although companies may have well-established positions within their respective markets that have historically provided competitive advantage, changes in technology can quickly introduce new competitors or level the playing field within existing markets. Such changes are “probably the most frequent cause of the demise of entrenched dominant firms.”\(^46\) The analysis evaluates the ability of technology change to alter the structure of the five industry forces: threat

of entry, threat of substitutes, bargaining power of suppliers, bargaining power of customers, and rivalry among competitors. This provides the ability to:

- Evaluate the alignment between ABC’s technology strategy and their overall competitive strategy
- Assess ABC’s choice as a technology leader
- Develop implications for the firm’s choices.

In terms of the logistics management system, this analysis provides the basis for ABC’s long-term plan including a development strategy and the option of marketing the technology externally as a product or service.

4.3.3 Analysis

The development of a logistics management system by ABC has components that the company views as innovative. Specifically, these functions include the instantaneous ability to calculate space usage within cargo containers, as well as the reduction of shipping costs from source to destination. Since the company sees LMS as key in sustaining a competitive advantage, the technology must be examined in terms of its effect on ABC’s position within the market.

Figure 13 shows the potential effects of the LMS technology with respect to the industry forces. Although this model provides an analytical view at the industry level, inserting a firm-specific variable allows for the extension of this framework to examine potential changes in industry attractiveness.
Figure 13: Potential Effects of ABC’s Logistics Management System Innovation

**Result: reduction**

**Threat of New Competitors in Building Products Wholesale**

- possible ability to imitate technology
- as a follower, new firms can learn from leaders that have gone through the growing pains, so cheaper for them to develop logistics
- further investment into R&D to match capabilities
- improvement in IT
- greater knowledge of the industry

**Result: reduction**

**Power of ABC Manufacturer**

- greater ability of ABC to efficiently manage their shipping logistics further reduces their switching costs (ie. Switching manufacturers can be done more efficiently)
- increased orders makes ABC a very valuable customer to the manufacturers

**Result: increase**

**Rivalry between Competitors in Wholesale Building Products**

- other firms will need to look for ways to compete:
  - improve efficiency to match costs
  - imitate LMS; requires R&D and IT investment
  - form partnerships (ie. buying groups, backward integration)
  - add elements of differentiation (additional services, etc.)

**Result: reduction**

**Power of ABC customers**

- any perception of LMS as a method to up-sell to the customer have a negative impact
- potential for increased savings as well as improved “real-time” shipment tracking information will reduce the chance a customer will go elsewhere
- less overall cost, less the buyer is able to look for “special deals”

**Result: reduction**

**Threat of Substitute Products**

- “cheaper” substitutes may lose cost advantage (ie. Reduces price gap between inferior products)

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Adapted from Porter (1979)\(^7\)

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Based upon the introduction of this innovation, each of the industry forces with which ABC interacts is now examined to analyze the potential effects:

1. Threat of Entry

In terms of the threat of new competitors, the moderate level of entry barriers is currently a balance between the low capital investment required versus low profit margins, the need to establish significant network relationships, and the issue of security registration under C-TPAT. Although IT generally constitutes a poor basis for competitive advantage due to the ability of firms to imitate it, the LMS system supports ABC’s ability to shorten the conventional distribution channel.\textsuperscript{48} Furthermore, this proprietary system forces any new potential rivals to make substantial investments in R&D in terms of IT and logistics. Porter’s findings reinforce this, stating that “technological change is what underlies the learning curve: the learning curve creates an entry barrier if the learning can be kept proprietary.”\textsuperscript{49} Furthermore, “technological change can alter the capital requirements for competing in a business, both directly, through requiring firms to make R&D investment, or indirectly, through affecting the capital required for production, logistical, or other facilities.”\textsuperscript{50}

The LMS system also adds a service directly to the customers in terms of cargo container utilization. This is an element of differentiation for ABC; however, this does support their cost-leadership strategy through a resulting lower price to the customer. As a result, this is consistent with their business model. All of these are factors that can in fact raise entry barriers. It should also be noted that the competitive position established by technology could only be sustained if

\begin{footnotesize}
\begin{itemize}
\item \textsuperscript{50} Porter, M. “The Technological Dimension of Competitive Strategy” \textit{Research on Technological Innovation, Management and Policy}, Vol. 1, p. 1-33, 1983
\end{itemize}
\end{footnotesize}
the technology can not be easily imitated by competitors. Otherwise, the technology can actually lower entry barriers as competing firms are able to learn from the pioneers within the industry.

2. Customer Bargaining Power

The overall effect of the Logistics Management System will be a reduction of the bargaining power customers currently have vis-a-vis the company. LMS provides ABC’s customers with an increased amount of information about the costs and processes involved in purchasing product from ABC. In general, IT innovations tend to increase buying power if customers can utilize the technology or the resulting information to ease backward integration. Furthermore, if the technology can reduce the level of differentiation between competing firms, the bargaining power is often increased. Due to the ABC’s long sales channel and cost-leadership strategy, neither will likely increase customer bargaining power through the introduction of LMS.

The opportunity to decrease the cost to customers through shipping efficiencies reduces the bargaining position they have over the company in terms of price comparison. Additionally, customers have less ability to expect a reduced price for large volume purchases if ABC continues to beat competitors on cost. There may be an element of pullback if customers perceive the system as a tool to up-sell them to larger orders. ABC should be mindful of this, and carefully market this sales component to minimize this potential effect. Although the overall effect on customer bargaining power is a reduction, in general it remains high due primarily to the minimal switching costs as outlined within the industry analysis.

3. Bargaining Power of Manufacturers

The low bargaining power that suppliers have with ABC is only further reduced with the development of LMS. The technology increases the company’s ability to manage their shipping logistics and further integrate this function with order processing, as well as other functions such as marketing and finance through resulting increased business intelligence. An increased
investment into IT within the company’s distribution should allow for ABC to switch suppliers should the need arise. Additionally, the value that LMS offers to customers could potentially result in increased orders. These factors position ABC as a very valuable purchaser to its manufacturers; a position that should be further supported by the LMS technology.

4. Substitute Products

The utilization of the LMS technology will reduce the price of ABC’s products to the customer. If customers may choose an alternate product based on a price gap with ABC’s product, a further cost saving may draw the customer away from the substitute. This would obviously only affect a product line for which substitutes are selected strictly on lower price. For example, if customers choose to substitute carpeting for ABC’s hardwood flooring products, a decrease in the price gap resulting from savings that LMS generates may be enough for these customers to reconsider. Although this effect is a generic result of price reduction rather than specific to logistics management, the outcome is still possible.

5. Rivalry Among Competitors

As described within the industry analysis, the degree of rivalry within wholesale building materials is high. This is due primarily to the high degree of market fragmentation in addition to the low profit margins and low switching costs for buyers. For firms competing on price, efficiency is important in all functions. Firms may compete on price with inferior products, but for those whose product quality is considered to be on par with competitors, the opportunities to reduce internal costs are limited.

The introduction of innovations within logistics management for ABC only further supports this intense level of competition among firms that compete on price. In addition to ABC’s business model that requires no held inventory and eliminates several layers of
distribution mark-up, further price reductions to the customer through shipping efficiencies creates even more difficulty for rival firms to compete. These rivals may look at ways to improve efficiency. However, substantial reductions strictly through attempts to streamline operations take time to implement and are not guaranteed to work. Further investments in IT and logistics management to imitate ABC’s technology may be possible, but this also takes time develop and requires in depth knowledge of systems and processes. In addition, these initiatives have an associated cost. Firms with existing financing or cash flow issues are unlikely to put significant investments into areas for which a clear return is uncertain. In a low margin, competitive industry, this may account for the majority of companies.

Another possible outcome of intensified rivalry may be consolidation, or the formation of partnerships and buyer groups. The effects of this are difficult to predict; however, any merger between firms usually results in difficulties, particularly in the integration of systems and cultures. Therefore, an immediate significant competitor resulting from a merger is doubtful. Buyer groups can realize cost savings, though significant coordination is often required and the amount of savings may not create any sizeable difference within the industry structure. A more plausible outcome may come in the form of increased levels of differentiation. If rival firms do not see a sustainable competitive position by competing on price, these companies may look for additional ways to add value for the customer.

4.3.4 ABC’s Choice as a Technology Leader

The development of innovations within logistics systems is a clear indication that ABC has chosen to be a technology leader in this area. There are benefits and drawbacks of both leader and follower positions, depending upon the nature of the technology and the company’s overall strategy. As a leader of technology change, ABC potentially benefits as a first mover in the service provided back to the customer. Although many technologies are susceptible to
imitation, a system with any reasonable degree of complexity will take time for rivals to understand, develop, implement, and market. As a leader however, ABC will likely invest more into a technology that is a first within the industry, as opposed to the investment required of followers as they learn from the pioneer while imitating such a system.

Since ABC’s LMS system provides both elements of cost savings and differentiation to the customer, the company could potentially benefit from both strategic aspects of technological leadership as described in Table 5. As the system is designed to integrate directly with existing processes, spill-over benefits could also be realized as efficiencies could be gained in multiple activities within the value chain. Conversely, stand-alone systems with only specific goals are often limited in the value they can provide. The lack of integration into existing processes can lead to unachieved targets, and may in fact hinder effectiveness due to a lack of efficient process flow and activity coordination.

Table 5: Technological Strategy and Competitive Advantage

<table>
<thead>
<tr>
<th>Cost Advantage</th>
<th>Technological Leadership</th>
<th>Technological Followership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pioneer the lowest-cost product design</td>
<td>Lower the cost of the product or value activities by learning from the leader's experience</td>
</tr>
<tr>
<td></td>
<td>Be the first firm down the learning curve</td>
<td>Avoid R&amp;D costs through imitation</td>
</tr>
<tr>
<td></td>
<td>Create low-cost ways of performing value activities</td>
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<table>
<thead>
<tr>
<th>Differentiation</th>
<th>Technological Leadership</th>
<th>Technological Followership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pioneer a unique product that increases buyer value</td>
<td>Adapt the product or delivery system more closely to buyer needs by learning from the leader's experience</td>
</tr>
<tr>
<td></td>
<td>Innovate in other activities to increase buyer value</td>
<td></td>
</tr>
</tbody>
</table>

Source: Adapted from Porter (1983) 51

4.3.5 Effect on ABC’s Strategy

The further development of a system to manage shipping logistics does create elements of differentiation for the company over competitors. Providing the ability for customers to adjust order sizes based on the maximum usage of space within a cargo container is a value added service. Additionally, the shipping and tracking management that provides detailed information to the customer on a specific order in terms of status and location also adds value.

In general, a strategy containing elements of both cost-leadership and differentiation are often contradictory. The internal activities required for each are different, as is the business culture associated with each. Employee incentives in each environment are also contrary. As a result, offering the lowest price to customers as well as other elements of added-value is rarely achieved and sustained by companies in terms of a long term strategy. Trade-offs will always exist within business, as the requirements for a company to excel in some area will most often require sacrifices in other areas. This does not imply that a mixed strategy is not possible, but rather that the combination of cost leadership and differentiation elements must be consistent and complementary.

In terms of ABC’s LMS technology initiative, elements of differentiation are consistent in relation to the company’s cost-leadership strategy. The services offered improve the price-point of their products from the customer’s standpoint, while supporting the streamlining of the value-chain. The system integrates existing processes within quote estimates and order processing, while gaining efficiencies across operations.

The long-term development plan should continue to focus on the elements that make the system an effective tool for the company, as well as maintaining the alignment between IT and overall corporate strategy. Use of the LMS system to provide cost savings to both the customer

and the company supports ABC's direction; however, the use of the technology as a separate product or service may distract the company from this focus. The company is currently in a phase of rapid growth in which there are numerous concurrent projects and initiatives. Resources are stretched thin, and the company is trying to handle its current success while moving into new areas in terms of products and markets. It is essential that ABC prioritize these various tasks, and ensure that "internal investments, programs and culture have all been directed toward a single end and there is buy-in on the part on everyone in the organization..." This consistency will provide a greater chance of creating a sustained competitive advantage over rival firms within wholesale building products.

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5 OPTIONS FOR TECHNOLOGY DEVELOPMENT

The development ABC’s Logistics Management System is based upon the identification of objectives achieved upon implementation. The LMS system is designed to create efficiencies within the organization, as well as to provide opportunities for customers to gain value through cost reductions of various shipping components. In addition, the company could potentially commercialize this technology. The product would consist of certain modules of the LMS to allow companies to efficiently manage shipping logistics, minimize the use of third-party providers, and reduce internal and customer costs. To evaluate a possible course of action, the options should be considered in relation to the company’s overall strategy.

5.1 Summary of Key Factors

Building upon the company’s core competencies, ABC has developed proprietary systems to manage distribution logistics to support their e-commerce business model. They follow a low-price strategy for products of comparable quality to those of rival firms. The company achieves its cost-leadership by the internalization of the majority of activities required to move goods from the manufacturer to the customer. While most competitors either outsource these activities, or rely upon the traditional channel of exporters, importers, and distributors, ABC eliminates these intermediaries and their associated price mark-ups.

The wholesale building materials industry is highly competitive, with an increasing level of bargaining power downstream within the distribution channel. With low switching costs for purchasers at all levels, establishing relationships is critical.
ABC competes against a variety of firms from big-box retailers to small independent wholesalers. While some have an online component to their business, none have developed the same business model of distribution ownership, zero warehoused inventory, and modest mark-ups on volume purchases. The following section examines the options in further detail.

5.2 Option 1: Commercialization

Companies that develop competencies in areas outside of their traditional core business can be successful in transforming these into new areas of business. Not only does this add revenue, these business units can act as a counter to downturns in core markets. In addition, development in secondary business areas further enhances these competencies through continued learning. This creates a positive feedback effect on the firm’s core business. The commercialization of the LMS system could potentially provide these benefits.

ABC’s own market research has shown that current logistics and supply chain systems do not provide the shipping efficiency calculations that the company requires. The in-house development of the LMS system creates the opportunity to market this as a product or service. Commercialization of this technology would certainly require investment and resources. Either as a product or a service, the system would need to be developed in a generic way to accommodate the needs of firms other than ABC. Such a venture requires a greater focus on the product lifecycle, quality assurance and control, marketing, documentation, and customer support.

For the company to pursue this initiative, a complete market analysis would be required. This analysis would include demand estimation, competitor analysis, entry strategy, targeted market segments, product positioning, and price-point analysis. If demand appears strong and the overall market analysis is favourable, ABC could establish a technology products business unit to develop and market an LMS system. As with the core business of wholesale building materials,
the company would need a clear understanding of their strategy, as well as industry forces as they relate to software products and/or IT services. As described in the analysis of the LMS system (section 4.3,) an understanding of the impact that this technology could have on the industry provides the basis for sales and marketing activities.

5.3 Option 2: Internal Utilization

As ABC continues the development of its LMS system as a strictly internal technology, the lone objective will be to support internal operations. The system can be customized based strictly on internal use, and integrated directly into existing systems and processes. The focus of development will be on the value creation for the company and the customers. Further functionality and enhancements do not have to consider external parties. ABC can also focus on the activities associated with this technology, rather than the technology itself. This is important to the management of their supply chain, as technology integration alone does not necessarily translate to performance efficiency. This consists of the continual coordination of activities such as planning and forecasting with distribution partners such as manufacturers and shipping providers. Activity integration, rather than technology integration, is an indicator of overall supply chain capabilities.54

The internal use of the company’s innovations in logistics management can also be directed specifically at creating a competitive advantage. As opposed to having a dual focus, development will support ABC’s low cost strategy rather than follow a parallel path of product management for a commercialized technology. Although it is certainly possible for different business operations to successfully achieve a firm’s strategic goals, often the path taken can result in conflicting internal objectives and incentives.

5.4 Risk

Most business decisions within an organization will involve risk. Both options presented for LMS development present some level of risk towards the company achieving objectives. The second phase of the system deals with problems with a high degree of complexity. With either cargo container usage or freight routing, even a “best solution” approach will require a substantial development effort to account for potentially exponential computations. A risk associated with either development option is that the system will simply not perform the way it was designed. This may be due to a misunderstanding of functional or technical requirements, or the increasing level of complexity within such as comprehensive system. There are also risks that are unique to each of the development options.

The option of commercialization is accompanied by the risk that this venture does not produce the returns that are anticipated. This may be the result of a number of factors. The demand for such a system in the marketplace may be overestimated, the price point may not be in line with market demand, or the introduction of such a system may invite imitators. In terms of the effect on ABC’s existing business, focus has been placed on the management of logistics due to the competitive advantage it provides over rivals. This presents the obvious risk of losing this advantage by allowing competitors gain the same functionality. Although IT systems are vulnerable to imitation, this imitation does take time to develop. Allowing competitors immediate access to the technology will eliminate this lag time and neutralize much of the first-mover advantage that ABC would have with the utilization of the system for internal operations.

The commercialization of the LMS system also presents risk to internal operations and other projects and initiatives. The capabilities required to produce a commercial grade software system will likely need development within the company. This will likely take resources away from other projects and may become a distraction for ABC in terms of a focus on core
capabilities and resulting internal characteristics of the firm that truly provide competitive advantage.

The option of keeping that LMS technology as a proprietary internal system also presents risk. Developing the system strictly for integration with existing operations may eliminate the opportunity of ever marketing these innovations, losing any potential revenue stream and diversification for the company into other areas of business. In addition, the commercialization offers the benefit of expanding the company's skill sets in a variety of disciplines including technology, sales, marketing, and associated management abilities.

5.5 Evaluation of Options

To assess the options for LMS development, each is analyzed to determine its potential impact on the company's overall objectives. Six objectives are used to evaluate the impact of each option on: revenue, cost-leadership strategy, product line development, technology development, building of partnerships and relationships, and company skill specialization in logistics and distribution. These objectives were selected based upon detailed internal report provided by ABC.\(^\text{55}\)

5.5.1 Qualitative Analysis of Technology Development Options

Table 6 list positive and negative effects of each development option on the company's objectives. The following section discusses each of these goals in terms of the impact that both options will have on the achievement of these objectives.

1. Impact on Revenue

The commercialization of LMS provides the potential for a new revenue stream. However, the actual amount of added revenue is unclear, and further information is required as

\(^{55}\) ABC Internal Report, 2006
part of a market entry analysis. ABC would certainly need to invest in commercialization, and the timeframe for a potential ROI is unknown. The prospect of business diversification into software development provides the added benefit of potentially buffering any downturns in the wholesale building products industry. If the commercialized venture does result in sales, this also has a positive benefit to revenue projections. However, the company is accepting the risk that a substantial investment into this venture may not achieve adequate returns.

Internal utilization should provide greater immediate benefits to revenues, as lower shipping costs will attract both new and repeat customers. In addition, the direct integration of the system with sales and marketing activities should also result in increased sales based on the company's existing marketing strategies.
2. **Impact on Cost Leadership Strategy**

Although both development options provide customers with lower prices on shipments, ABC’s internal activities associated with each option are different. Commercialization may force the company to lose focus on the parts of the business that have created the existing price...
advantages through internal cost reduction. The continued internal use of LMS is certainly consistent with cost leadership and low market price, and creates direct efficiencies in internal order possessing and distribution.

3. Impact on Product Line Development

A major component of ABC’s goals for the next few years is the addition of new products. Some of these products are within completely different areas of building materials, though all are consistent with the strategy of relatively high-margin, finished products. The addition of these will require investment into all areas of business, including customer order processing and shipping logistics management.

The commercialization of LMS will not provide any direct benefits to achieving this goal. Conversely, the on-going development of internal logistics management should ease the addition of new product lines. As the company adds to the existing distribution network, the proposed functionality with LMS allows for greater external linkages and streamlining of the entire order and shipping process.

4. Impact on Technology Development

Both development options provide benefits to ABC’s expertise in IT. The company’s position as a technology leader is reinforced, though the commercialization initiative would expose internal personnel to a wider range of development functions. In addition to the production of a generic version of the system, expertise would be needed in software release management, support, and quality assurance. Although this provides a diverse set of skills to IT staff, the benefits of supporting existing processes may provide the greater overall benefit to the growth of ABC’s technology infrastructure.
5. Impact on Building of Partnerships and Relationships

One advantage that commercialization may provide is company exposure into new areas of business and to a different set of organizations and individuals. This may create opportunities for new relationships that may not have otherwise been available. As with other goals however, this initiative may in fact detract attention from the formation of relationships that are essential to ABC’s core operations and competitive advantage. The internal use of LMS has specific components, namely XML data transfer, which will directly enhance the company’s distribution network and gain efficiencies in order management.

6. Impact on Specialization in Logistics and Distribution

Both options for the development of the LMS technology will build upon the company’s mandate to specialize in logistics and the distribution component of the supply chain. Commercialization will likely provide experience in different areas of logistics as ABC designs a system that is targeted at markets other than those within which the company competes. However, there is obvious risk in developing towards a potential market that is not yet established. Conversely, the continued focus on the logistics aspects of current operations will certainly provide benefits in operational efficiency. This is also consistent with the company’s cost-leadership strategy.

5.5.2 Quantitative Analysis of Technology Development Options

To evaluate and justify opportunities in business, senior managers often look for specific measures. These measures often come in the form of ROI estimates based on financial models such as net-present value or discounted cash flow. Similarly, models such as “real options” suggest as the maximum amount of initial investment that should be made in order to provide the company the option of future development. These models could certainly be utilized as in-depth
measures of required financial investment; however, initial quantitative assessment can be performed using an impact matrix to assign values to alternatives.

Based upon the goals outlined previously (section 5.5.1,) a weight is assigned based on the priority placed on each goal according to ABC’s internal report (2006.) These weights provide a percentage for each in terms of a calculation of a rating for both options. The rating scheme used for this quantitative analysis is based on estimation of impact that each development option will have on the stated goal as measured from low to high with corresponding values as indicated in Table 7.

<table>
<thead>
<tr>
<th>Impact of Development Option on Company Goal</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>1.0</td>
</tr>
<tr>
<td>Medium-Low</td>
<td>1.5</td>
</tr>
<tr>
<td>Medium</td>
<td>2.0</td>
</tr>
<tr>
<td>Medium-High</td>
<td>2.5</td>
</tr>
<tr>
<td>High</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Using this methodology, an estimated impact and associated value can be assigned to the impact of each development option on company goals. Subsequently, a value is multiplied by the weight, and a weighted rating is calculated for each. Finally, the sum of these weighted ratings provides an overall score for each development option for the LMS system. Table 8 provides the breakdown of the impact estimates, corresponding values, and the overall score.

The previous assessment of each development option is supported by the quantitative analysis that rates option 2 (internal utilization) at a score of 2.75, ahead of option 1 (commercialization) at a score of 2.18. Although the impact matrix is based upon a subjective

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evaluation that can be subject to biases, this does provide a tool for decision makers to
development strategic plans based on a formal methodology. Additional tools and models can be
investigated to supplement this assessment.

Table 8: Development Option Impact Ratings and Overall Scores

<table>
<thead>
<tr>
<th>Objective</th>
<th>Weight</th>
<th>Impact on Objective</th>
<th>Rating</th>
<th>Weighted Rating</th>
<th>Impact on Objective</th>
<th>Rating</th>
<th>Weighted Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Impact on Revenue</td>
<td>0.2</td>
<td>Medium</td>
<td>2</td>
<td>0.4</td>
<td>Medium-High</td>
<td>2.5</td>
<td>0.5</td>
</tr>
<tr>
<td>2 Impact on Cost Leadership Strategy</td>
<td>0.2</td>
<td>Medium-Low</td>
<td>2.5</td>
<td>0.5</td>
<td>High</td>
<td>3</td>
<td>0.6</td>
</tr>
<tr>
<td>3 Impact on Product Line Development</td>
<td>0.15</td>
<td>Low</td>
<td>1</td>
<td>0.15</td>
<td>Medium</td>
<td>2.5</td>
<td>0.375</td>
</tr>
<tr>
<td>4 Impact on Technology Development</td>
<td>0.15</td>
<td>High</td>
<td>3</td>
<td>0.45</td>
<td>High</td>
<td>3</td>
<td>0.45</td>
</tr>
<tr>
<td>5 Impact on Building of Partnerships/Relationships</td>
<td>0.15</td>
<td>Medium</td>
<td>2</td>
<td>0.3</td>
<td>Medium-High</td>
<td>2.5</td>
<td>0.375</td>
</tr>
<tr>
<td>6 Impact on Specialization in Logistics/Distribution</td>
<td>0.15</td>
<td>Medium-High</td>
<td>2.5</td>
<td>0.375</td>
<td>High</td>
<td>3</td>
<td>0.45</td>
</tr>
</tbody>
</table>

| Overall Score                               | 2.18   | 2.75               |

5.5.3 Discussion

Through an in-depth analysis of each development option for ABC’s Logistics Management System, the company can construct a plan for this technology in terms of a consistent alignment with the company’s overall objectives. Both a qualitative and a quantitative analysis were performed providing detail on the relationship of each option with these objectives. Based on the previous analyses of the industry, the company, the technology, and its impact, a recommendation is now provided for the future of the LMS system.
6 RECOMMENDATION

At the present time, ABC should focus on the internal use of their logistics management system. The commercialization of this technology may offer potential returns, but the long-term ability to sustain returns is uncertain. Furthermore, the result may be a loss of focus on activities that provide competitive advantage.

In planning the future development of the LMS technology, ABC must be clear on their objectives, and on how the selected course of action will contribute to achieving those objectives. ABC clearly competes on price by utilizing an unconventional approach to their supply chain relative to competitors, and by relying upon a demand-driven supply network. Through the establishment of strong relationships with manufacturers, shipping providers, and repeat-customers, ABC has created components within their business that are difficult for competitors to imitate.

The company’s focus on logistics reinforces their competitive position by continually building upon internal expertise in terms of the inter-relatedness of distribution activities. Innovations in technology certainly support this position by creating linkages between functions and personnel. This integration between the supply chain and IT can allow the company to identify and respond to market changes more effectively and efficiently. This provides a shield from immediate competitor imitation, and provides the basis for sustained competitive advantage.57

In terms of commercializing logistics technology as either a product or service, one must consider the ability of this venture to support ABC’s strategy. Due to the high degree of imitation to which information technology is vulnerable, the long-term ability to realize significant returns is far from certain. Not only are competitors able to imitate such systems, but a significant change in industry cost structure and customer bargaining power can result in competitors being compelled to imitate them. As a product or service separate from core operations, the LMS technology would compete within a different industry consisting of different levels of competition. This alters the actual value that this system creates to either the company or the customer, as this value is fundamentally linked to its integration with ABC’s primary activities.

ABC has experienced significant growth since its inception, and is currently faced with several resulting challenges. There is certainly internal pressure on existing resources to handle this growth, and a loss of focus can often be the result. Sustained competitive advantage will be based on the company’s ability to build upon areas that are difficult to imitate. Furthermore, company must continue to understand the needs of customers, as “organizations sustain a competitive advantage only so long as the services they deliver and the manner in which they deliver them have attributes that correspond to the key buying criteria of a substantial number of customers.”

An on-going focus on relationships within the distribution network as well as an integration of technology throughout the supply chain will provide a strong basis for competition. In terms of business diversification, growth across a variety of geographic regions will help to counter market downturns.

6.1 Conclusion

As a wholesaler of building materials, ABC utilizes innovations within logistics to manage the entire distribution component of the supply chain. By eliminating intermediaries such as importers and distributors and by leveraging an e-commerce sales platform, the company successfully competes on price for equivalent products to that of competitors. The development of their LMS technology is a critical component within the integration of order processing and shipping management. The latest initiatives in ocean and ground shipping efficiencies are designed to reduce internal costs as well as to reduce the price to the customer. This system offers the potential to provide value as a commercialized product or service. However, the ability of rivals to imitate IT systems presents uncertainty and risk in the pursuit of this venture. To establish a sustained competitive advantage, ABC should focus on relationships and on the integration of technology into processes that support their overall strategy.
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