Value Chain based E-Business in the Apparel Retail Industry

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Abstract

This paper develops e-value and e-customer chains in terms of e-business to show how Information Technology (IT) could be adopted in the apparel retail industry. The analysis of e-business is classified as business-to-business, business-to-customer, customer-to-business, and customer-to-customer. Items in these four e-business types are classified to show the IT solutions in apparel retail industry. The analysis of these items was performed on the top ten dominant companies in the U.S. apparel retail industry to illustrate the current status of IT adoptions in e-business. The results of this study are beneficial to decision makers and managers in the retail industry to make better decisions on e-business and IT adoptions.

Keywords: Apparel Retail Industry, Retail Industry, Value Chain, Customer Chain, Information Technology, E-Business

1. INTRODUCTION

Traditionally, the apparel retail industry was defined as the process by which retailers purchased brand labels from manufacturers and then sold those brand labels to consumers. Due to the rapid globalization during the past decade, manufacturers are not the only ones in the apparel retail industry who are creating brands. By contracting with oversees factories, apparel retailers have been successful at designing and creating their own labels. As a result, retailers in the apparel industry have broaden their core competencies and entered into other facets of the supply chain (Baker, 2004).

Historical data on the U.S. apparel retail industry shows that there has been a steady increase in sales over the last decade. Figure 1 provides a graph of the estimated annual retail sales between 1992 and 2003 (Annual benchmark Report for Retail Trade and Food Service, 2004).

Globalization has presented many challenges for firms in the apparel retail industry. One of these challenges has been to develop an information technology (IT) infrastructure that enables efficient and timely communication throughout the global supply chain. Due to the complexity of establishing a comprehensive IT system, many firms have outsourced this function to third party vendors who possess the skill and expertise to implement the necessary hardware and software required to communicate via an extranet. In order to stay competitive in the global market, it is critical that retailers make the investment for an IT system that will facilitate communication and coordination of all activities throughout the global supply chain. An adequate IT system should include functions that handle logistics, inventory management, warehouse management and distribution (Supply chain links, 2004).

**Estimated Annual Retail Sales
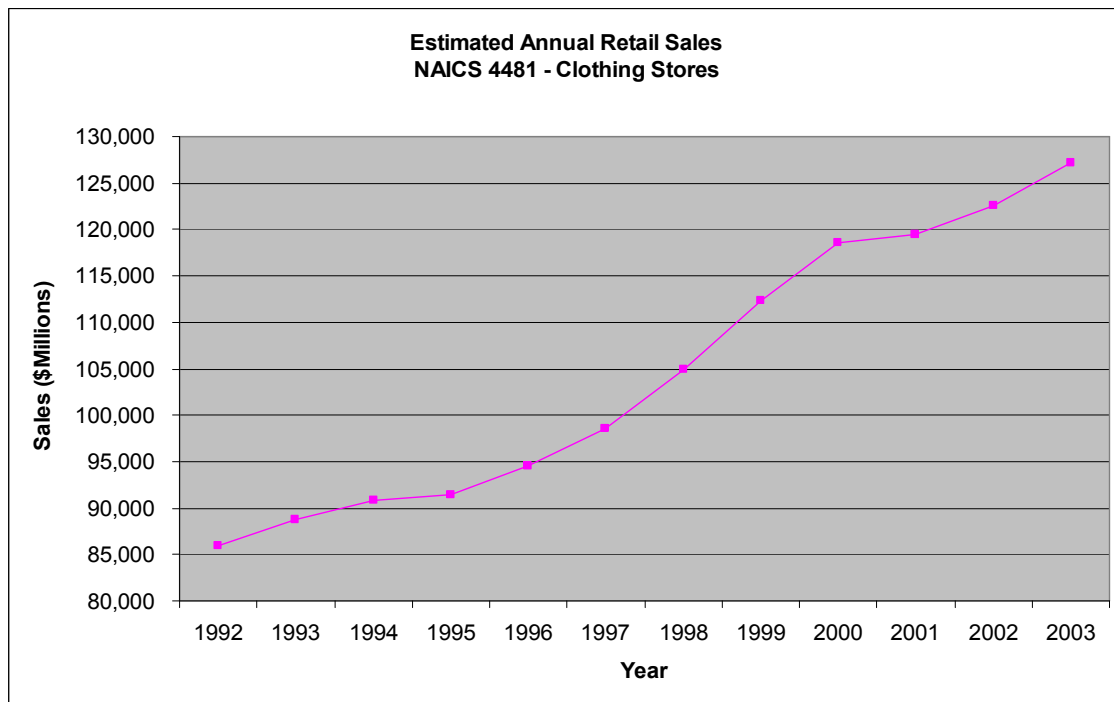NAICS 4481 - Clothing Stores**

Figure 1: Estimated Annual Retail Sales (NAICS 4481-Clothing Stores) (Annual benchmark Report for Retail Trade and Food Service, 2004)

The creation of the World Wide Web is another factor that has increased the globalization of the retail industry. The development of e-commerce through the internet has prompted many retailers to establish websites that allow customers throughout the world to order goods online. There are many obstacles that traditional bricks and mortar retailers must overcome once they make the commitment to design a virtual on-line store. Those retailers who establish on-line internet sites find that they have a competitive advantage over those retailers who opt out of creating a website. It is important to acknowledge that the number of U.S and world wide internet users is steadily increasing over time.

This paper presents e-business solution to the apparel retail industry in terms of e-customer chain and e-value chain. Specifically, in Section 2, the generic e-customer chain and e-value chain in the apparel industry are developed to illustrate how IT can be adopted in the apparel industry. In Section 3, the e-business solutions derived based on chain discussions in Section 2 are

presented and classified based on business-to-business, business-to-customer, customer-to-business, and business-to-internal in apparel retail industry. In Section 4, the top 10 dominant companies in the apparel retail industry are analyzed based on these e-business solutions in Section 3. In Section 5, conclusions are provided.

2. E-CUSTOMER CHAIN AND E-VALUE CHAIN ANALYSIS

During the past decade, many retailers have started to evaluate their retail chains in an effort to increase efficiency and reduce cost. While the idea of e-commerce did not surface until 1998, there has been increasing discussion of its importance in today's global market (Abend & Penny, 2000a). It is important to have a clear understanding of the different types of retail chains that exist. This section presents the e-value chain and e-customer chain in the apparel retail industry. Also, a comparison will be done to analyze the differences in the traditional chains and the IT

adopted chains. Based on these two e-chains analyses, the items in e-business will be classified based on business-to-business, business-to-customer, customer-to-business, and business-to-internal.

2.1 Customer Chain and E-Customer Chain

Knod & Schonberger (2001) defined customer chain as "provider-customer links, extending from origin of a product or service through sale to the end consumer and on to post sale service". Therefore, each employee is a customer of the previous process, and each employee has a customer (the next process, or where the work goes next).

Knod and Schonberger have a narrow definition of a customer chain that focuses on the development of a product through a system in which each employee in the next process is considered a customer of the previous process. This can be viewed as a customer to customer chain (C2C). A broader definition would incorporate another component in the customer chain. That is the business to business (B2B) customer chain. In order to have an all inclusive definition of a customer chain, both the B2B and C2C component parts should be present.

In the current study, a customer chain can be defined as a two-level process which transforms raw materials into finished goods. The first process is the external coordination of business activities with in a supply chain where there is an agreement made for each business to provide a good or service to the next business customer in the supply chain. The second level is the internal operations of each business within the supply chain working to provide a good or service to the next process. An e-customer chain in the current study can be defined as two-level process that incorporates the use of IT to coordinate the activities of the external and internal customers in a supply chain.

A comparison of a traditional value chain and an e-value chain will reveal some clear similarities and differences between the two. Figure 2 provides a traditional customer chain while Figure 3 incorporates the use of e-commerce in the customer chain in the apparel retail industry.

The traditional customer chain indicates that the mode of communication between both the B2B customer chain and the C2C chain is the phone and mail. Under the e-customer chain, B2B customers communicate through an extranet while the employees of each business use an intranet to communicate. An e-customer chain enables information to be communicated in a more efficient and timely manner. The traditional customer chain and the e-customer chain are similar in that they both define a customer in the same manner. That is, an internal customer is viewed as the next process and the external customer is the next business in the supply chain to receive goods or services. In order for value to be added in each stage of a products life cycle, it is critical that every provider in the customer chain view the next business or process as a customer.
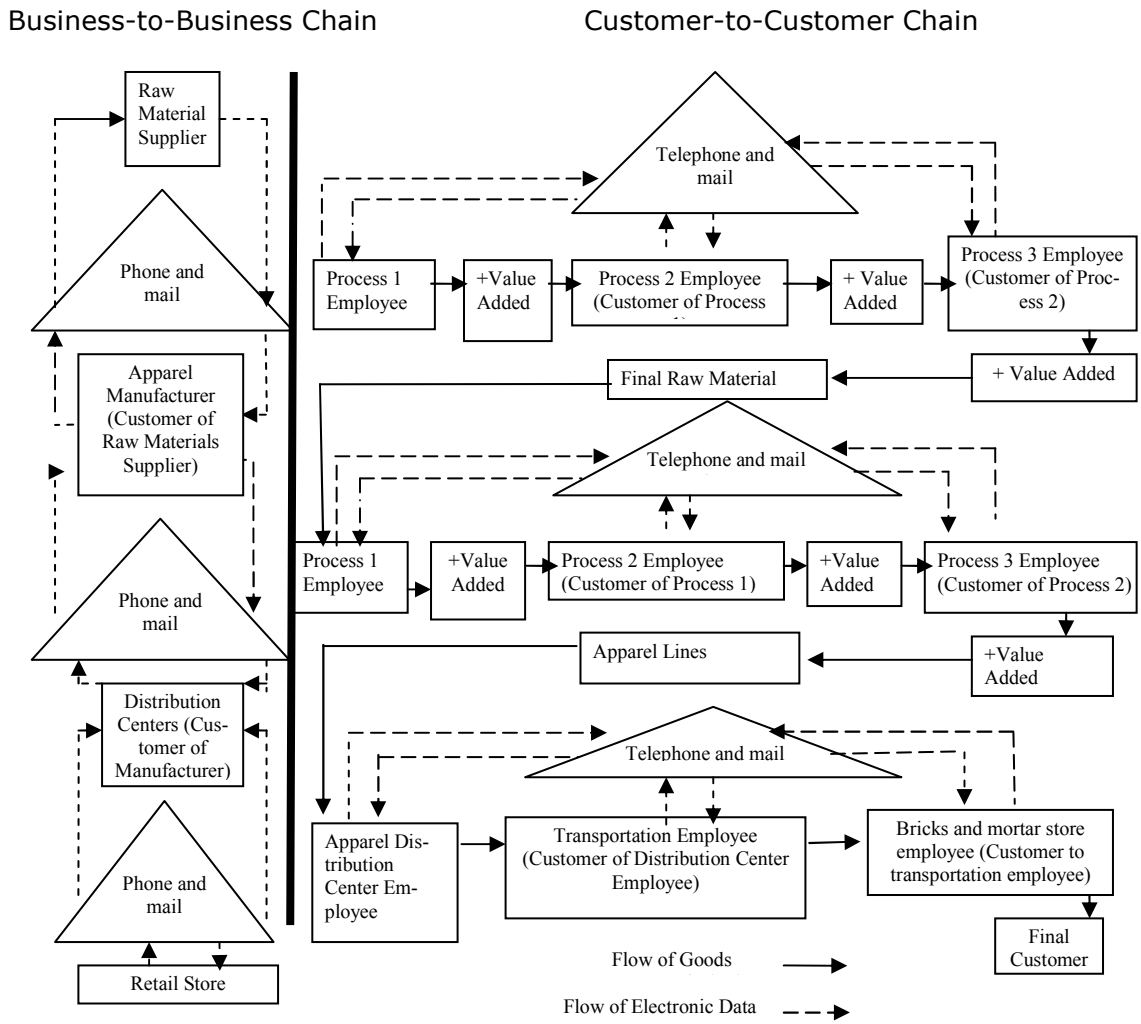
Business-to-Business Chain   **Customer-to-Customer Chain**

Figure 2: Customer Chain in the Apparel Retail Industry

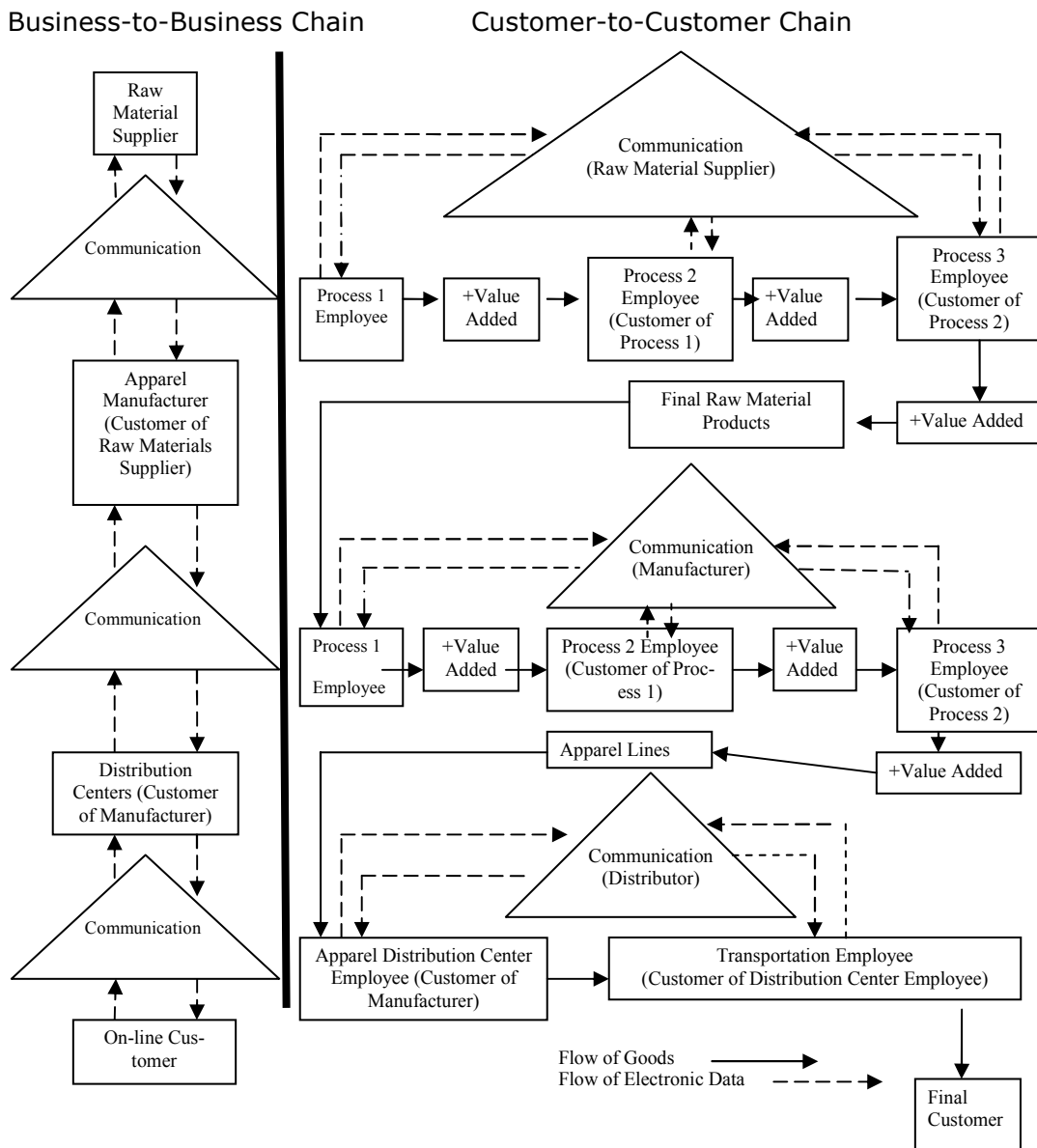Business-to-Business Chain   Customer-to-Customer Chain

Figure 3: E-Customer Chain in the Apparel Retail Industry

2.2 Value Chain and E-Value Chain

Michael Porter's value chain is a tool used by companies to evaluate their operations in order to identify the value adding activities. In this study, Porter's value chain is modified to incorporate the use of IT. Due to the increasing use of technology in today's global market, it is important to recognize that companies can increase their value generating activities by implementing IT. Additional value is created because operations can become more effective and efficient.

Value chain is defined as the "sequential set of primary and support activities that an enterprise performs to turn inputs into value-added outputs for its external customers" (ICH Glossary, 2004). Another definition of value chain is as "a series of activities a company performs to achieve its goal by adding additional values when each activity proceeds from one stage to

the next one" (Glossary, 2004). In the current study, a value chain can be described as the value adding processes and activities of a products life cycle.

An IT value chain refers to the "subset of enterprise activities that pertain to IT operations, both to add value directly for external customers and to add indirect value by supporting other enterprise operations" (ICH Glossary, 2004). In the current study, an e-value chain incorporates the use of internet technologies and supply chain management software to increase the value adding process of a product's life cycle.

The significant difference between Michael Porter's value chain and the IT adopted value chain is the incorporation of an extranet and intranet to increase speed and communication throughout the supply chain. Figure 4 modifies the generic value chain from Michael Porter's Generic Value Chain (2004) to incorporate IT. The use of IT helps businesses to add value to each stage of production because data can be communicated quicker and more accurately. Value is created when a supplier meets or exceeds a customer's expectations and non-value adding activities are removed from the supply chain. Figure 4 has the descriptions on IT adoptions in each of these five primary activities, and those in each of these four support activities.

PRIMARY ACTIVITIES								
Intranet								
Inbound Logistics		Operations		Outbound Logistics		Marketing & Sales		Service
Transportation of raw materials (cotton, silk, wool) to the apparel factories.	>	*Transformation of raw material into apparel lines.*	>	*The transfer of finished goods from apparel factories to strategically located distribution centers*	>	*R&D on consumer demand.* *Advertising and promotion of seasonal apparel lines.*	>	*Customer service call centers.*
SUPPORT ACTIVITIES								
Extranet								
Firm Infrastructure: *Corporate values, financial accounting system, use of an intranet, organizational structure.*								
HR Management: *Hiring, training, development and compensation*								
Technology Development: *Incorporating the use of advanced supply chain management technology to stay competitive.*								
Procurement: *Implementing a program to ensure compatibility with suppliers of materials, supplies and equipment.*								

Figure 4: E-Value Chain in the Apparel Retail Industry

2.3 E-Business Solutions in the Apparel Retail Industry

Based on discussions on e-customer chain and e-value chain, the e-business solutions are developed and classified in terms of business-to-business, business-to-customer, customer-to-business, and business-to-internal. Table 1 presents these items. There are total nine solutions (A1 to

A9) in business-to-business, fifteen solutions in business-to-customer (B1 to B15), three solutions in customer-to-business (C1 to C3), and two solutions in business-to-internal (D1 and D2).

Table 1: E-Business Solutions in Apparel Retail Industry

Business to Business	Business to Consumer	Consumer to Business	Business to Internal
A1 Store to store inventory look-up capabilities	B1 Personalized Consumer Accounts	C1 Online access in bricks-and-mortar stores	D1 Intranet Technologies
A2 E-Procurement	B2 Order Tracking System	C2 E-commerce	D2 E-mail
A3 Electronic Data Interchange	B3 Search Capabilities (by key word or item number)	C3 Online job search capabilities	
A4 Web-based Supply Chain Management Solutions	B4 Event Notification (via e-mail)		
A5 Web-based Logistics Solutions	B5 Electronic Shopping Cart		
A6 On-line Tax Filing	B6 Electronic Payment System		
A7 Electronic Funds Transfers (EFT)	B7 Online Gift Certificates		
A8 E-mail	B8 Electronic Funds Transfer System for E-Checks		
A9 Extranet Technologies	B9 E-mail Order Notification		
	B10 Online Customer Service Support (via e-mail)		
	B11 Online Store Locator		
	B12 Links to Related Sites		
	B13 Online Press Room (with search capabilities)		
	B14 Online Financial and Stock Information		
	B15 Online Human Resource Recruiting System		

3. E-BUSINESS SOLUTIONS IMPLEMENTATION IN THE TOP TEN DOMINANT APPAREL RETAIL COMPANIES

Wagle & Driscoll (2004) provided the top 10 specialty apparel retailers ranked by their respective revenues in 2002. These top dominant companies in the apparel retail industry are: Gap, TJX, Limited Brands, Ross Stores, Burlington Coat Factory, Charming Shoppes, Talbots, Abercrombie & Fitch, American Eagle Outfitters, and Ann Taylor. By investigating these top ten dominant companies' web sites, and conducting telephone interview with em-

ployees in these companies, Table 2 presents the implementation status for e-business solutions. Some finding in Table 2 are:

- In business-to-business solutions, there are three categories. Items A6, A7, and A8 have been implemented in all these top ten companies in category 1; items A2, A3, A4, A5, and A9 have been implemented in five or six of these top ten companies in category 2; and item A1 has been implemented in only one company in category 3.
- In business-to-customer solutions, there are three categories. Items B10, B11, B13, and B14 have been implemented in all top ten companies in category 1; items B1, B2, B3, B5, B6, B7, B9, B12, and B15 have been implemented in eight or nine companies in category 2; and items B4 and B8 have two or three companies in category 3.

- In customer-to-business solutions, there are two categories. Items C2 and C3 have been implemented in 9 companies in category 1, and item C1 only in one company in category 2.
- In business-to-internal solutions, all items (D1 and D2) have been implemented in all these top ten companies.
- Gap implemented all these 29 solutions; Charming Shoppes and Talbots have implemented 25 solutions; Burlington Coat Factory has 24; TJX has 23; Limited Brands has 22; American Eagle Outfitters has 20; Ambercrombie & Fitch has 19; Ann Taylor has 18; and Ross Stores has 16.
- There are a total of 29 solutions used in this analysis. Seven out of the ten companies have implemented 20 or more of these solutions.

Table 2: E-Business Solutions for Top Ten Apparel Retail Companies

	Gap	TJX	Limited Brands	Ross Stores	Burling-ton Coat Factory	Charming Shoppes	Talbots	Amber-crombie & Fitch	American Eagle Outfitters	Ann Taylor	**Total**
A1	1	0	0	0	0	0	0	0	0	0	**1**
A2	1	0	0	1	1	1	1	0	0	0	**5**
A3	1	1	0	1	1	1	1	0	0	0	**6**
A4	1	0	0	1	1	1	1	0	0	0	**5**
A5	1	1	0	1	1	1	1	0	0	0	**6**
A6	1	1	1	1	1	1	1	1	1	1	**10**
A7	1	1	1	1	1	1	1	1	1	1	**10**
A8	1	1	1	1	1	1	1	1	1	1	**10**
A9	1	1	0	1	1	1	1	0	0	0	**6**
Sub-total	**9**	**6**	**3**	**8**	**8**	**8**	**8**	**3**	**3**	**3**	
B1	1	1	1	0	1	1	1	1	1	1	**9**
B2	1	1	1	0	1	1	1	1	1	1	**9**
B3	1	1	1	0	1	1	1	0	1	1	**8**
B4	1	0	1	0	0	0	0	0	1	0	**3**
B5	1	1	1	0	1	1	1	1	1	1	**9**
B6	1	1	1	0	1	1	1	1	1	1	**9**
B7	1	1	1	0	0	1	1	1	1	1	**8**
B8	1	0	1	0	0	0	0	0	0	0	**2**
B9	1	1	1	0	1	1	1	1	1	1	**9**
B10	1	1	1	1	1	1	1	1	1	1	**10**
B11	1	1	1	1	1	1	1	1	1	1	**10**
B12	1	1	1	0	1	1	1	1	0	1	**8**
B13	1	1	1	1	1	1	1	1	1	1	**10**
B14	1	1	1	1	1	1	1	1	1	1	**10**

B15	1	1	1	1	1	1	1	1	1	0	**9**
Sub-total	**15**	**13**	**15**	**5**	**12**	**13**	**13**	**12**	**13**	**12**	
C1	1	0	0	0	0	0	0	0	0	0	**1**
C2	1	1	1	0	1	1	1	1	1	1	**9**
C3	1	1	1	1	1	1	1	1	1	0	**9**
Sub-total	**3**	**2**	**2**	**1**	**2**	**2**	**2**	**2**	**2**	**1**	
D1	1	1	1	1	1	1	1	1	1	1	**10**
D2	1	1	1	1	1	1	1	1	1	1	**10**
Sub-total	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	
total	**29**	**23**	**22**	**16**	**24**	**25**	**25**	**19**	**20**	**18**	

Note: 1 - implemented and 0 - Not implemented.

Table 3 maps the e-business solutions presented at Table 1 to the primary and support activities in the e-value chain at Figure 4. The check marks in Table 3 indicate that there is a relationship between the e-business solution and the e-value chain activity. Some finding in Table 3 are:

- Business to business solutions are the most important factor in adding value to inbound logistics, operations, and outbound logistics. The business to business solutions enable retailers to communicate more effectively and efficiently with their suppliers. Also, additional value is added to the outbound activities when retailers use e-business solutions for personalized consumer accounts and order tracking. Value is added because these solutions provide the retailer and their customers with quick and easy access to detailed information about the status of their accounts and the orders that have been placed.
- For marketing, sales, and service, generally all four classifications of e-business solutions add value to these primary value chain activities. These e-business solutions enable retailers to gather information about their customers' preferences in order to better meet the demands of their target markets. Also, e-business solutions increase the speed of communication throughout the supply chain enabling retailers to respond more quickly to changing consumer demands. By improving their response time, retailers can provide better service to their customers.
- All of the business to business and business to internal solutions add value to a retailer's infrastructure. These e-business solutions add value to a retailer's infrastructure because transactions can be processed in real time. Real time processing reduces the amount of time required to process transactions and improves the efficiency of operations. Also, business to consumer solutions that add value to the firm infrastructure are those that enable the organization to process payments more efficiently.
- The on-line human resource recruiting system is the e-business solution that adds value to the human resource management support activity. For several reasons, this e-business solution can improve the retailers' recruiting process. First, on-line recruiting advertisements can reach more people than under traditional advertising methods. Second, job seekers can obtain specific information about the company and its recruiting process. Lastly, on-line recruiting systems have the capability to identify the most qualified candidates for each open position through various search functions. This can reduce the amount of time human resource employees must spend reviewing job applications they receive.

- All of the e-business solutions add value to the technology development activities. Implementing e-business solutions is critical to the technology developments of the organization. Technology adds value to the organization because it allows retailers to stay competitive and communicate in today's global market.

- Business to business and business to internal solutions add value to the procurement activities. These e-business solutions add value to the organization because they improve the speed and accuracy of communication between the retailer and their suppliers.

Table 3: Mapping of E-Business Solutions to E-Value Chain for the Apparel Retail Industry.

	Inbound Logistics	Operations	Outbound Logistics	Marketing & Sales	Service	Firm Infrastructure	HR Management	Technology Development	Procurement
A1			√	√	√	√		√	
A2	√	√	√	√	√	√		√	√
A3	√	√	√	√	√	√		√	√
A4	√	√	√	√	√	√		√	√
A5	√	√	√	√	√	√		√	√
A6						√		√	
A7	√	√	√	√	√	√		√	√
A8	√	√	√	√	√	√		√	√
A9	√	√	√	√	√	√		√	√
B1			√	√	√			√	
B2			√	√	√			√	
B3				√	√			√	
B4				√	√			√	
B5				√	√			√	
B6				√	√	√		√	
B7				√	√	√		√	
B8				√	√	√		√	
B9				√	√			√	
B10				√	√	√		√	
B11				√	√			√	
B12				√	√			√	
B13				√	√			√	
B14				√	√			√	
B15					√	√	√	√	
C1				√	√			√	
C2				√	√			√	
C3					√			√	
D1				√	√	√		√	√
D2				√	√	√		√	√

Note: √ indicates e-business solution adds value to activities.

4. CONCLUSION

This paper develops e-value and e-customer chains in terms of e-business to show how IT solutions can be applied to business-to-business, business-to-customer, customer-to-business, and business-to-internal. A retailer can gain a

competitive advantage if they implement IT that enables them to have more effective and efficient supply chains. It will become increasingly difficult for retailers to sustain their competitive advantage as more retailers implement the same technology and also improve their supply chains. The findings from this study provide information about the degree to which e-business solutions have been implemented by the top ten apparel retailers. The findings from this study also provide valuable information about how retailers can use e-business solutions to improve their e-value chain and e-customer chain. There are several major findings in this study.

First, the nine solutions in the business to business category can be used to improve the effectiveness and efficiency of communication between businesses in the apparel retail supply chain. All ten apparel retailers analyzed in this study have implemented solutions for on-line tax filing, electronic funds transfers (EFT), and e-mail. Five to six retailers have implemented solutions for e-procurement, electronic data interchange, supply chain management, logistics, and extranet capabilities. One retailer has implemented an e-business solution for store to store inventory look-up capabilities. This finding can be used to identify ways retailers can improve the communication capabilities of their supply chains.

Second, the fifteen solutions in the business to customer category can be used by retailers to identify value adding activities in the customer chain. It is important for retailers to identify e-commerce solutions that enhance their customers' online shopping experience. By providing customers with innovative online capabilities, retailers will increase the value of their service. In this study, eight to ten retailers have implemented thirteen out of fifteen businesses to customer solutions. The least implemented e-business solutions in this category include event notification and EFT for e-checks. By recognizing the least implemented solutions, retailers can identify the ways to improve the service they provide to their customers.

Third, e-business solutions can provide retailers with insight on their customers' shopping behaviors and patterns. Retailers can gather and accumulate customer data in order to identifying trends and preferences. The consumer to business solutions for e-commerce and online job search capabilities have been implemented by nine out of the ten retailers used in this study. Only one retailer has implemented online access in their bricks-and-mortar stores.

Fourth, effective and efficient communication between departments with in a company is imperative to providing customers with superior service. E-business solutions can provide retailers with the necessary tools to ensure that all important information flows through the organization quickly and accurately. All retailers in this study have implemented business to internal solutions for intranet capabilities and e-mail.

Fifth, identifying the different levels of implementation provides insight to retailers on how they stand up against their closest competitors. All ten of the retailers studied have implemented at least 16 of the 29 solutions (55.2%). IT solutions can be costly and difficult to implement. Retailers must take the necessary steps to ensure that the solutions they choose to implement will add value and improve the effectiveness and efficiency of their operations.

Sixth, mapping the e-business solutions to the e-value chain helps to identify which solutions add value to primary and support activities. There are many different types of e-business solutions that are available to retailers. Before a retailer decides to implement new IT, it is critical that they identify how value is added to their primary and support activities. Sometimes companies are inclined to implement new technology because of certain IT trends that may occur with in their industry. While it is important to be aware of how competitors are using technology, retailers must take the time to evaluate the impact of new technology on their own operations.

In conclusion, the use of IT to increase e-business capabilities is an inevitable part of the future for the apparel retail industry. As globalization continues to increase and

more retailers extend their operations oversees, it will become increasingly important for them to have the IT technology to communicate effectively and efficiently through the e-customer chain and e-value chain.

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