# TECHNOLOGY ENABLED APPAREL RETAIL EMPLOYEES

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The apparel retail industry is one of the largest employers in the United States and has experienced vast changes since the first department stores appeared in the 1800s. Employment as a retail salesperson was long considered a rewarding career choice for people who enjoyed interacting with customers. However, research showed that perceptions of retail as a career choice and the satisfaction of shoppers were on the decline. Low levels of employee job satisfaction and customer service ratings for retail employees, as well as negative perceptions of retail as a career provided an opportunity for the introduction of hybrid technology interfaces. These interfaces could support employees in their work, improve customer service and provide additional experience and knowledge for purposes of retail employee career development.

This study examined apparel retail employees and the factors that influenced their intention to adopt three different hybrid technology interfaces representing emerging technologies for the apparel retail industry: a body scanner, product configurator and social networking. The Technology Acceptance Model served as a theoretical framework for evaluating employees' behavioral intention to use the three emerging technologies. A laboratory setting with examples of the three technologies was used to test apparel retail employee reactions and data were collected using a questionnaire. The results showed that the usefulness of the technology was a main influence on behavioral intention for all three types. Conceptual

frameworks based on the Experience Economy and the retail store as a theater space for staging experiences, rather than services were also used to evaluate future applications of technology inside clothing stores as part of customer and employee service interactions. Participant responses to open-ended questions provided additional insight into the capacity of technologies to support employee work and develop skills and knowledge for future job positions. A career path for possible new job roles associated with technology adoption and a future retail store concept are presented as well as implications of study findings for retailers.

## BIOGRAPHICAL SKETCH

Tasha Lewis was born and raised in Columbus, Ohio. She grew up with an interest in fashion design and international studies and while in high school became a dedicated viewer of both CNN 's *Style with Elsa Klensch* and *World News* programs on Sunday mornings. She attended The Ohio State University with intentions to major in International Relations but instead chose to pursue her interest in Latin American culture with a major in Spanish. Before graduating, she took two elective courses in the department of textiles & clothing and realized that she wanted to pursue further study in the area. After graduating with honors from Ohio State, she worked for an airline and continued to take classes in textiles & clothing and she eventually applied to the department's graduate program to pursue a Master's degree. Wanting to combine her interest in Latin America and the fashion industry, she began studying the North American Free Trade Agreement and the apparel industry relationship between the United States and Mexico, as well as areas of cultural and historic dress related to the region. Her research allowed her to spend a summer abroad in Mexico studying NAFTA at the Colegio de Posgraduados in Montecillo and to attend the Costume Society of America's regional conference in Puerto Rico to present her research on folk dress in Panama. After receiving her Master's degree, Tasha worked as a production assistant for Lane Bryant and during this time she experienced the corporate apparel retail processes that would later influence her research interests. Other job opportunities took her to Miami and New York City to work in for apparel manufacturing firms. She returned to Columbus in 2002 and began working for Express as a customer relations coordinator and also started teaching as a lecturer in the Department of Consumer & Textile Sciences at

Ohio State. While simultaneously working in both retail and academia, Tasha realized that the two areas were not mutually exclusive and that she could combine her varied interests in the fashion industry with the research and teaching she wanted to pursue in academia. In 2005, she started her doctoral studies at Kansas State University and transferred to Cornell University in 2006 to enroll in its new PhD program in Apparel Design. Tasha will continue to enjoy her combined interests in fashion and international studies as a professor in the Faculty of Communication and Design at Ryerson University in Toronto, Canada.

Apply your heart to instruction and your ears to words of knowledge

Proverbs 23:12

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# CHAPTER ONE

# INTRODUCTION

The retail industry is one of the largest sources of employment in the United States, providing jobs for over 16 million people, with almost 1 million people working in apparel stores, making these stores the third largest employment sector in retail (U.S. Bureau of Labor Statistics, 2009). There were severe problems faced by the apparel retail industry* in the economic recession of 2008 and 2009, particularly significant declines in consumer spending, which indicated that serious challenges faced the industry in the future. Bankruptcies, mergers and employee layoffs were the response of many apparel retailers in this climate (Friedman, 2009; Talley, 2009). Apparel retailers that were successfully navigating the recession appeared to have a unique product that appealed to a particular consumer market (Casey, 2009).

The apparel retail industry emerged in the late 1800s as ready-to-wear clothing became available through the mass production of the Industrial Revolution. Department stores like Macy's, Lord & Taylor and Marshall Field's emerged during this time. Sears catalog expanded the accessibility of ready-to-wear clothing to those who were not able to visit a department store for purchases. The retail salesperson was key to the operations of the department store – personable and viewed as an expert replete with knowledge about the product and service orientation that encouraged the customer to a final sale. A single department store employed hundreds of people to staff the different departments and created display cases to attract the consuming public.

* see Appendix J for definitions

One only need visit Macy's original flagship store on 34th Street in New York City to get a feel of the grandeur of the possible scale of a department store and the number of sales people who were needed to staff its departments so that each customer received personal attention. Macy's, like many department stores, was known for its window displays, particularly at holiday time. In the 21st century, the retailer still presented theatrical-like window displays often linking fashion merchandise to popular culture (e.g., television shows and NASCAR). Customers were drawn into the store to purchase items based on the experience designed and presented behind the glass panes. The department store shopping format remained dominant throughout the 1950s but in the 1960s and 1970s the growth of specialty retailers and the suburban shopping mall began to erode the importance of the department store.

Companies like The Gap and The Limited began to offer customers a focused assortment of clothing based on new lifestyles and a price range that was more affordable and equally fashionable. These stores became experts in knocking off designs from the European runways, the same designs that department stores offered from the original designers. The specialty apparel salespersons were not a part of a larger department store hierarchy but rather became an extension of the specialty apparel brand – often times wearing a type of branded uniform consisting of the clothing sold in the store as a demonstration of their enthusiasm towards the retailer's products. The entire store, not only peripheral windows, became a display for the shopper's experience with attention to fixtures, music, and marketing that would draw the customer into the brand. An excellent example of how specialty stores** have

* see Appendix J for definitions

encroached on traditional department store territory was Victoria's Secret – purchased by The Limited Inc. CEO Leslie Wexner in the 1980s after he perceived the lack of femininity and beauty in lingerie found in US department stores compared to lingerie stores in Europe. Wexner re-created the European store environment, complete with classical music and Victorian furniture and built its assortment around intimate apparel – the experience around the brand and its products gained increasing loyalty among female shoppers. Ironically, a two-story Victoria's Secret store was built in 2006 directly across the street from Macy's on 34th Street in New York City, a visual reminder of the ascendancy of the specialty store.

As department stores faced competition from the growing number of specialty stores, they began to lose sales and subsequently sought ways to cut costs – one of the solutions was to reduce the number of salespeople. Specialty stores did not require the same quantity of people to staff stores and store layouts made it easier for customers to find items by category. In both cases, the role of the salesperson became less of a focus for retailers. Specialty apparel retailers and department stores were also facing competition from mass merchandisers like Target, Wal-Mart and Kohl's that offered minimal customer service on their sales floor and lower price points. The perception of clothing brands also diminished as customers considered style features or price over well-known brands in order to make purchase decisions. The shopping experience became largely self-serve for the customer in the mass merchandise environment and customers may not even expect any level of personal service. The fantasy of the department store window display and the brand experience of the specialty store virtually disappear in the vast floor space of mass merchandisers and customers shop for clothing in much the

same way as for laundry detergent.

The rise of the specialty store and then the mass merchandiser was supported by technology that allowed retailers to streamline their supply chain and get new merchandise into stores faster than department stores. Behind the scenes, distribution centers, logistics software and inventory tracking sped up the time to market for fashion. Computerized cash registers and bar code scanners enabled real-time tracking of store inventory levels so that new merchandise could be shipped before out-of-stocks occur. Spanish specialty retailer, Zara, had drastically reduced the fashion cycle time from design development to store delivery from months to just weeks using a combination of technology, centralized distribution and strategic sourcing, allowing Zara to pass The Gap as the world's largest apparel retailer in 2008 (Anonymous, 2008). Zara took note of the shopping frequency of its customers and realized that if it offered new merchandise whenever the customers came back to the store, they were likely to make purchases. The company also empowered its store employees to be style watchers and encouraged them to feed new trend information back to the company's designers. Target adapted its own version of "fast fashion" by introducing its GO International™ product line featuring clothing created exclusively for Target by a prominent fashion designer and sold for a limited time. This exclusivity was similar in effect to the limited quantities offered in boutique stores and served to attract customers into the self-serve environment of the mass merchandiser giving the impression of service, not through direct contact with salespeople but through attention to the product and the technology used to make it available. Apparel retailers had not abandoned the notion of offering service but rather reduced the importance of the role of the sales associate in providing service since

technology allowed for different service offerings that transformed the shopping experience from the earlier days of the department store.

I once heard the CEO of a large specialty retailer jokingly recount how when he fails to find a sales person in a department store he purposely leaves merchandise from one department in a different area of the store as an indicator to employees that the item was abandoned by a customer who never received any assistance. This CEO's actions were a clever way to signal to a department store that something needed to be done – that people were necessary to customer satisfaction.

Two initiatives initiated by Express stores in 2003 illustrate interesting approaches to engaging both store associates and customers and linfluenced my course of research. As part of a new denim product campaign, Express stores invited shoppers in large metropolitan areas like Los Angeles and Miami to come into the stores for private shopping events, style makeover lounges and photo sessions in which the shopper could pose as a supermodel. The retailer also hired professional artists to design exclusive artwork that would be prominently displayed as tags to differentiate the various denim styles. The following year, Express launched a new merchandise line called the *Express Design Studio.* The marketing of the line emphasized the design and creative functions of the company's actual design studio space in New York City and showed images and names of the company's designers in different vignettes. Photos of working sketches, technical notes and the designers at work were prominently displayed throughout the store as marketing while the vignettes played on television monitors.

Store associates were called *Brand Sales Reps* and were trained to talk to customers about clothing details in new ways in order to emphasize quality

and attention to details. They were encouraged to become “fashion insiders” and increase their knowledge of fashion and style outside of work by absorbing information from certain television shows and magazines. The stores were also provided with a listing of local tailors who could provide clothing alteration services for customers. Most importantly, the company revised its customer service model from the scripted, ordered version called the *5 Step Selling Model* to one called *Doing What’s Right for the Customer*, with an emphasis on listening and responding to customer needs.

Increased attention to store atmospherics, or how the physical space was designed and visually merchandised as indicators of customer experience, provided the backdrop for thinking about new in-store experiences, often aided by technology. For example, what if the retail store design studio could become a real space equipped with the technology that would support store associates as brand representatives?

Product information and fashion media news could be stored in a data base that could be accessed by employees and customers at a kiosk located on the sales floor or at a dedicated computer station or *virtual mirror* in the dressing room area (where most customers might need further assistance). Technology could offer customers sizing and styling customization opportunities for clothing -- instead of scheduling an alteration or leaving without a purchase, customers could work with a retail employee in a consulting area of the design studio using computer-based product configurators that allowed customers to view and select style or color choices for clothing. Other ubiquitous technology tools for brand representatives might be found throughout the store such as touch screens and interactive merchandise display tables that could provide virtual visualization of new

styles searchable by customer preferences, both style and fit, or provide additional product information whenever an item was picked up from a table or shelf. Social networking sites could be accessed in the stores as well as from external locations to communicate new arrivals, trends, and other information with customers based on their past purchases.

The goal of this research was to study how technologies could be used in areas of work in apparel stores that had not been traditionally considered for their use. New technologies emerged that were relevant applications to the type of work done in retail stores and warranted formal evaluation of their benefits to the apparel retail industry.

While the dominant store format in the United States has shifted away from department stores to specialty and mass retailers, the essential role of the salesperson that was the hallmark of customer service in department stores may once again emerge enabled by technology. Employees are the front-line of customer information since they are the first point of contact in retail stores. If they can effectively harness customer information using technology that may be transferred to buying offices or design studios, apparel retailers can quickly respond – exploiting the efficiencies that already exist in their supply chains.

By introducing store employees to technology that allows them to help customers create or customize their own clothing, retailers could prevent customers from leaving a store simply because the specific item they wanted was not available. Technologies that equip the employee with increased product or apparel trend information could also improve customer relationships as customers may view employees as knowledgeable experts. Improvements in customer satisfaction and employee job satisfaction could be the byproducts

of a profitable apparel retail environment where customers are willing to shop for items that represent greater value since they have been customized to their needs or preferences and where employees are viewed as an essential resource in this process and perhaps too valuable to expend.

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# CHAPTER TWO

# REVIEW OF LITERATURE

## Introduction

The apparel industry was greatly affected by advances in technology, which made companies more efficient and competitive. In the 1980s and 1990s retailers The Limited, Benetton and The Gap experienced exceptional growth as a result of managing their design, production and distribution processes with the help of technology that allowed them to track sales and quickly adjust production to customer demand (Pine, 1993). By the 21st century, more apparel retailers had perfected the use of technology in their supply chain and competition in the apparel industry increased as similar items reached customers at the same time across retailers (Ander & Stern, 2004). Spanish retailer, Zara, took the industry lead in using technology and strategic production locations to deliver new apparel items to its stores in approximately two weeks from the time they were designed and developed (Rayport & Jaworski, 2005). Mass discounter Wal-Mart used a sizeable computer system to track inventory and sales for its stores in real-time so that customers rarely experienced an item being out-of-stock (Bernhardt, 1999; Rayport & Jaworski, 2004).

The technologies that have improved the value and variety of apparel available in retail stores were rarely seen by consumers who experience the benefit of a competitive apparel retail industry or by the employees who sell the products. Apparel retailers began to use technology in their supply chain as the result of a problem in the industry – long lead times for production that left little room for adjustment if consumer tastes changed and often resulted in

significant price mark downs if items did not sell.

Another opportunity for technology use in the apparel industry emerged -- problems associated with customer and employee satisfaction in the retail store. Customers indicated that store associates were a major source of their dissatisfaction in retail stores (Knowledge@Wharton, 2007) and employees were unsatisfied and disinterested in their jobs (Knight, Crustinger & Kim, 2006; Rhoads, Swinyard ,Geurts & Price, 2002). Technology embedded in the apparel retail store offered the potential to give store employees more opportunities to initiate contact with customers, support many of their existing responsibilities, and potentially make them more efficient and enhance their job experiences.

One example of technology used in stores was wireless headsets or radios, which allowed retail employees in different areas of the store to talk to one another in order to quickly respond to customer inquiries or search for merchandise. The coordination of store service aided by wireless devices is an example of what Rayport and Jaworski (2005) call “hybrid” interfaces – where people are supported by technology as they work in service situations.

Apparel retail stores could be considered an interesting format for the use of a variety of hybrid interfaces since employees have remained a necessary and valuable part of the customer’s store experience. Could this experience be positively influenced if technology became more visible and useful in the store environment for both the employee and the customer?

This research examined different types of technology and their value in supporting employees in their work, creating better service interaction with customers and enhancing employee job roles. Technologies that were emerging in the apparel industry were evaluated based on how different

technology types could provide benefits for employees and their interactions with customers in the apparel retail store environment.

**Retail Work**

Danziger (2006) suggested that retailers create in-store excitement by involving customers with the store and its brands. This involvement required the development of “points of customer interaction with products”, especially in active formats that promoted customer creativity and self-expression. She emphasized that involvement could be augmented by having knowledgeable employees (Danziger, 2006).

While knowledgeable employees were valuable to the customer experience and thus to the retailer, the challenge was in retaining employees and making sure they were satisfied in their jobs. Swinyard (1997) predicted a shortage of entry-level retail workers based on slowing population growth that may lead to decreased retail profits. Employee turnover was also a concern for the retail industry (Samli, 1998) as the U.S Department of Labor reported that the turnover rate of employees was 34.7% in 2006, the 3rd highest voluntary turnover rate after jobs in food services and hospitality (NOBSCOT, n.d.).

To address these issues, retailers like Macy’s, JCPenney and Wal-Mart, realizing that they would be affected by a shortage of retail executives in the near future, initiated their own in-house employee development and training programs to cultivate and retain their workers (Reda, 2008). These in-house programs were different from the executive training programs that recruited recent college graduates and trained them to assume initial positions in the company. Employee development was defined by Noe (2008) as education and experiences, often not related to employees’ current job that prepared employees for future job roles. Samli (1997) argued that developing

existing retail employees has become a crucial part of retailers' survival in order to keep pace with the sophistication of products and systems brought about by technology.

The retail industry has suffered from low-paying jobs that lacked growth potential and discouraged current and potential employees from considering it as a long-term career (Swinyard, Langrehr & Smith,1991;Broadbridge, 2003). Research reported by Knight et al. (2006) revealed that apparel merchandising students already working in retail stores were more interested in other potential retail career areas such as product development and public relations than those in store management. In another study, retail store managers who were college graduates were found to be more dissatisfied than retail corporate office workers and indicated that they had less autonomy and less variety in their jobs and showed higher turnover intentions (Rhoads et al., 2002).

Retail employee dissatisfaction affected the service experience of customers. High employee turnover and high numbers of temporary employees were associated with low customer satisfaction ratings at Sears stores while those stores with lower employee turnover and a higher proportion of regular full-time workers showed higher customer service scores in a study by Ulrich, Halbrook, Meder, Stuchlik and Thorpe (1991). Additionally, a recent survey of 1000 customers conducted by the Verde Group and Wharton's Baker Retail Initiative program revealed that customer dissatisfaction with store employees was a major contributor to lost sales and that specialty apparel stores required employees who were personable (called *engagers*) and could provide customers with product information (called *educators*) (Knowledge@Wharton, 2007).

**Apparel Retail Employees.** Target was an example of a company that invested in store employees to correct poor customer service ratings and high employee turnover (Rowley, 2003). For example, in the late 1980s, Target realized that customers did not want the level of one-on-one personal service provided at retailers like Nordstrom but customers did want employees who could answer questions when asked and kept the store clean and well-stocked. Target also noted that the service customers received was directly correlated to how the company treated its own employees. The company adopted the Walt Disney Corporation's approach to customer service training and began calling customers *guests* and employees *team members* (Rowley 2003; Levy & Weitz, 2001). To reduce employee turnover, Target incorporated more flexibility for employee scheduling, revised rules and policies so that employees could be more empowered to help customers and developed a process to identify job applicants with an interest in retail as a career.

Part of Target's process of identifying new employees involved conducting research to find out what characteristics made entry-level retail workers successful and which of those characteristics were innate and which required training (Rowley, 2003). In terms of employee development, the innate personality traits Target sought to understand included mental and physical capabilities known as *abilities*, and the trainable traits were known as *skills* (Noe, 2008). According to the Occupational Information Network (2009) skills required for a retail salesperson included *active listening*, *social perceptiveness*, *critical thinking* and *reading comprehension*; while abilities included *oral expression*, *speech recognition*, *information ordering* and *problem sensitivity*. Target's employee skills training included courses to teach employees the value of having an enthusiastic attitude and how to relate to a

customer's motivation for shopping.

Zappos.com, an online apparel and footwear retailer, was another example of a company that realized its own success was rooted in the job satisfaction of its employees. Similar to Target's approach, the company sought to identify quality employees early in the hiring process and even offered $2000 to employees during training classes as an incentive to leave the company just to make sure employees who chose to stay were truly passionate about working at Zappos (O'Brien, 2009). The company's CEO, Tony Hsieh, noted that the company's goal of delighting its customers first started with delighting its employees (McFarland, 2008). Some strategies used by Zappos to delight employees included providing them with free lunches, full health coverage, substantial flexibility in dealing with customers and encouraging creative problem-solving of customer issues, such as searching a competitors' websites to locate an out-of-stock item (O'Brien, 2009).

While Target and Zappos served as ideal examples of the benefits of apparel retail employee job satisfaction, studies have also shown that employee satisfaction and customer satisfaction were directly related. Schlesinger and Zornitsky (1996) found that 80% of employees who were satisfied with their ability to provide customer service, were also more satisfied with their jobs. The same study revealed that efforts aimed at improving employees' ability to provide customer service also increased job satisfaction, which the researchers predicted would also lead to customer satisfaction (Schlesinger & Zornitsky, 1996). Linkages between positive employee attitudes about their employer and customer satisfaction were also found by Tornow and Willey (1991).

**Retail Theater.** Baron, Harris and Harris (2001) proposed that creating

new and improved job roles in the context of *Retail Theater* would also provide job satisfaction for retail store employees while reducing employee turnover and influencing customer satisfaction. Retail Theater referred to the creation of store environments designed to create fun, excitement and customer experiences. Baron et al. (2001) presented four different concepts as theatrical movements and described the roles of both customers and employees in these environments: *voyeur, spect-actor, sense-ceptor* and *connoisseur*.

For *voyeurs*, merchandise is presented in a realistic setting and there is a distance between the actors (employees) and the audience (customer) with very little interaction between the two groups since employees are either busy getting products or being a character. *Spect-actor* customers are expected to know that they are in an environment where selling is taking place and they are able to critique the merchandise and its presentation. There is high interaction of customers with employees as well as with other customers regarding product information. Employees working in the *spect-actor* setting were described as having non-traditional retail positions since they " are primarily facilitators of information exchange between customers rather than necessarily being experts in the field" (Baron et al., 2001, p.107). The *sense-ceptor* customer is expected to have physiological responses to in-store stimuli and this customer is presented with opportunities to physically interact with the product or experience simulations, while employees are both behind the scenes creating the experience and out front helping the customer with interactions or simulations. The *connoisseur* customer is left to his or her own interpretations of the abstractly presented product with no assistance from employees, who serve as "human exhibits" or as movers of merchandise displays.

The four customer movements, while highly engaging and informative for customers, were also presented as a means of transforming the retail employee (actor) toward enhanced job roles, training and reduction of "boredom costs" (Baron et al., 2001). The use of technology as part of retail theater could serve to further enhance the customer experience and the roles of employees in retail stores.

**Technology in the Apparel Retail Environment**

Studies have been conducted to evaluate consumer perceptions and intentions to use technology in stores. Burke (2002) found that customer interest in in-store technology among respondents included electronic shelf labels, electronic signs, kiosks and handheld scanners. In another study by Kamali and Loker (2002), subjects participated in a mass customization process by using a web-based product configurator to design t-shirts, and results indicated that the majority of participants were interested in this customer design process and willing to purchase the t-shirt they had designed. Researchers also found positive customer interest in body scanning technology by people who have experienced the scanning process (Loker, Cowie, Ashdown & Lewis, 2004; Lewis & Loker, 2007). When asked about interest in new technologies for the apparel retail industry, Lee, Kunz, Fiore and Campbell (2002) found that female respondents were more willing than males to use body scanning technology for design of customized apparel and that females wanted to see the customized product on an image of themselves in the store, to have the ability to use the computer for surface design and to have assistance from a store employee with a specialized fashion design background. Wood (2002) found that apparel shoppers imagined the use virtual communication, body scanning, databases and customization tools as

part of their shopping experience in the 21st century.

These desired in-store, technology-enhanced apparel design experiences extended beyond traditional retail shopping and suggest that today's apparel customers were interested in a more interactive shopping experience. However, the technology that was capable of providing the experiences desired by consumers was not yet widely available in retail stores.

The Occupation Information Network (2009) listed the tools and technologies associated with work done by retail salespersons and included barcode scanners, calculators, computerized cash registers, credit card readers, and software to support accounting, human resource and point of sale functions. These technologies, while capable of supporting service interactions with customers, (e.g. the use of a barcode scanner to find out if more of an item is available in the store or ordering an out-of-stock item via a computerized register) would not support the innovative application of technologies for design and customization activities in which customers wanted to engage.

**Retail Work and Technology.** Swinyard (1997) argued that in the increasingly competitive retail environment, technology use determined retailer success and required a technologically educated retail management workforce. The majority of apparel retail stores did not demand a high level of technological skill on the part of the employee as most functions, like merchandising, pricing or visual displays, were controlled and disseminated to the stores by corporate headquarters or regional offices (Rayport & Jaworski, 2005) for easy implementation. The organization of retail store functions also included what Heskett, Sasser and Schlesinger (2003) referred to as a

structuring down of retail jobs to their “lowest component” so that the need for training was reduced. This caused a “cycle of mediocrity” characterized by low compensation, limited training, low capability support systems, restricted latitude to meet customer’s needs, unclear expectations, and few rewards which collectively led to employee dissatisfaction and subsequently to high rates of employee turnover. Managers in turn directed a significant amount of time and effort to departing employees and new hires (Heskett et al., 2003). Also, customer satisfaction suffered in this cycle as the ability to develop employees for managerial or other advanced positions was hindered by the high rates of turnover. The US Department of Labor (2009) predicted positive growth opportunities in retail in the coming decade due in large part to the number of new employees required to offset high levels of employee turnover.

Rayport and Jaworski (2005) linked the trend in what they called “stagnant customer satisfaction ratings” over the last decade to shortages of service personnel who worked in the equivalent of “sweatshops of a postindustrial society”. They proposed turning this shortage into a technological opportunity for the use of machines to support and supplement work done by humans. They argued that this may portend another industrial revolution since “a scarcity of labor, combined with new technological possibilities, creates the dynamics that drive industrial revolutions, wherein entire economies, led by innovative companies, embrace new ways to augment human effort” (p.7-8).

Similarly, Rifkin (2004) described the arrival of the *Third Industrial Revolution* dominated by computerization, which occurred between the end of World War II and the present when *thinking machines*, such as robots, computers and software, were applied to a larger portion of analytical work

previously carried out by people. According to Rifkin (2004), in the first Industrial Revolution (mid 1800s), steam power was the catalyst to augmenting work previously done by people and animals, and in the second Industrial Revolution (1860 – World War I), machines driven by oil and electricity absorbed more of the work done by people in industries such as agriculture, transportation, and manufacturing. A concern expressed by Rifkin (2004) during the *Third Industrial Revolution* was the employment of people who were displaced by work that was taken over by machines, particularly in the manufacturing sector. As automation became an increasing part of the service sector as well, Rifkin predicted the availability of retail jobs, which have long been an alternative source of employment for displaced manufacturing workers, would also decline. An example of automation in the retail industry was the use of hand-held scanners and computerized cash registers that allowed a few employees to carry out the counting of store inventories which was once done manually and required the help of a greater number of employees (Bernhardt, 1999).

Pine and Gilmore (1999) viewed the automation of work in the service sector as a transition to what they called the *Experience Economy*. The *Experience Economy* described a shift in developed nations from economies based on providing services to those based on providing experiences. This transition has taken these countries from economies based on commodities (crops or minerals), then goods (made from commodities), then services and ultimately experiences. Commodities provided the raw material for the production of goods, a process which supported the expansion of the first Industrial Revolution when advances in manufacturing allowed for the conversion of raw materials into finished goods in mass quantities. The service

economy was dominated by the use of goods (e.g. clothing) to perform an activity for a customer (e.g. tailoring or design), which was customized to his or her requests. The introduction of automation in the service economy (similar to automation for the production of goods) was an indicator that the service sector had peaked and was giving way to experiences. Experiences were the cornerstone of retail theater (Baron et al., 2001) and in the *Experience Economy* goods served as props and services as a stage to engage customers in memorable experiences (Pine and Gilmore, 1999).

**Mass Customization Experience: The Case of Nike.** An interview with the Advanced Imaging Manager of Nike's Apparel Innovation team, Joshua Young, offered further insight into the introduction and use of technology in the apparel retail store environment from the perspective of a company already known for its ability to create customer experiences in its stores (Joshua Young, personal communication, October 2008). Niketown stores were classified as themed flagship brand stores (Kozinets, Sherry, DeBerry-Spence, Duhachek, Nuttavuthisit & Storm, 2002) where customers could not only purchase Nike shoes and apparel but also engage in entertaining experiences that reinforced Nike's brand image. The brand image at Niketown and the experiences used to reinforce it were considered so unique to retail stores that researchers have conducted ethnographic studies of Niketown locations to evaluate a retail space that has been considered museum, theater and playground where customers can view sports memorabilia or try out a pair of Nike shoes on the in-store basketball court (Sherry, 1998; Penaloza, 1999). In 2007, with the introduction of NIKEiD in its New York City flagship store, Nike added another experience to its store environment -- mass customization. The Nike customer was now able to

interact with employees known as design consultants as they proceeded through the 45-minute customization process to create their own footwear or apparel (PR Newswire, 2007). This transfer of Nike's online customization software to the physical store space represented a shift to *the brick-and-clicks hybrid* format predicted to become the future retail store model (Kozinets et al., 2002).

The future for many apparel retailers could mean adopting Nike's existing model of providing in-store customization of their products in order to remain competitive. As an industry leader in providing experiences, Nike was already looking ahead to increasing in-store innovation for its customers. According to manager Joshua Young, Nike's customization program was definitely a competitive advantage for the company and had made Nike a leader in the wearable goods industry (J.Young, personal communication, Ocotber 2008). He described NIKEiD as one of the most sophisticated programs for customizing footwear at the retail store level and expected Nike to maintain that lead while also being able to strategically advance in terms of other customization possibilities, such as moving from footwear into clothing customization, adding capabilities that allowed for personalized fit for the customer (instead of using only Nike's specification measurements) and producing customized items in-store. At the time of the interview, NIKEiD allowed customers to receive help from a consultant as they designed footwear and at the end of the design session, customesr received a print out of their customized shoe and waited about four weeks for the shoe to be manufactured and delivered to their home. However, with apparel he envisioned other possibilities inside the retail store enabled by apparel technologies that would support finding the perfect fit and visualizing that fit on

a virtual image.

Traditional apparel production has favored methods of mass production that allowed for economies of scale and competition among retailers who could most efficiently manage their production process to provide the most items to customers in the least amount of time at the best price. Nike's move to in-store customization of clothing, especially in terms of fit, was definitely a challenge to a production system based on volume and minimal choices. Even the NIKEiD customization process for footwear had some limits for the choices available to consumers in terms of selecting colors and shoe styles and used standard shoe sizing for fit.

Joshua argued that the manufacturing capabilities, in terms of equipment and technology (like body scanners, virtual fit software and laser cutting), already existed in the marketplace to handle such personalized mass customization but that adoption by manufacturers was not widespread due to traditional views and systems within the apparel industry favoring mass production. Mass customization typically required smaller production quantities and more frequent changes in equipment to accommodate differentiation in styles than what was required for mass production. So manufacturers accustomed to large production runs with few or no changes in their production lines might not easily see the benefit of interrupting or dedicating some of those lines for mass customized products. Joshua was convinced that an increased awareness of the technologies and equipment available for mass customization, along with an understanding of how to use them could result in manufacturing facilities capable of supporting the needs of large retailers like Nike.

The US Department of Labor (2009) reported that automation would not

overtake the retail industry due to the service nature of the work, which required the interaction of customers and employees, suggesting that workers would not be displaced by technology to the degree predicted by Rifkin (2004). However, the nature of service work could change the retail industry as discussed by Pine and Gilmore (1999) and services would become a stage and transition to experiences. Retail jobs may be available but job roles could change since employees would be required to deliver not just services but memorable experiences for customers. For example, employees could be hired based not only on their ability to greet customers or ring up sales transactions but they would also need the ability to host customers in store environments where customers could design clothing, or provide services for for a fit or style consultation. How then can technology be incorporated into the retail store environment to deliver memorable customer experiences and support the valuable service work that is essential in the retail industry?

**Technology-Enabled Points of Customer Interaction**. Froehle and Roth (2004) conceptualized how both employees and customers might interact with technology in service situations and described five modes for different situations. The modes of customer contact were further divided into *face-to-face* and *face-to-screen* contact. Face-to-face contact involved interpersonal contact between the customer and a service representative including:

- **technology-free** mode (no use of technology during service encounter)
- **technology-assisted** mode (technology aids the service representative to improve customer interaction – the POS system is classified here)

- **technology-facilitated** customer contact mode (service representative and customer both use technology to enhance the interaction).

In face-to-screen contact modes, technology was the only point of contact, including:

- **technology-mediated** mode (technology is used as the only means of interaction between customer and service representative)
- **technology-generated** customer contact mode (technology substitutes for service representative)

Froehle (2006) investigated how service representatives influenced customer satisfaction in the technology-mediated mode by measuring consumer satisfaction after using technologies such as online chat and email to interact with employees. Results indicated that personal characteristics of the employee related to thoroughness, knowledge and preparedness influenced customer satisfaction regardless of the type of technology used by the employee to support the service encounter. No evaluations of employees or their reactions to the use of technology were measured, but the results suggested that the hybrid format of customer interactions, using the best of what people and technology had to offer, would potentially provide the best customer experience.

Similarly, Rayport and Jaworski (2005) described their customer-employee interface archetypes as *people-dominant*, *machine-dominant*, *people-led hybrid* and *machine-led hybrid*. The hybrid formats involved both a person and technology but were distinguished by whether or not a person or a machine was in the forefront. Retail stores made use of the people-led hybrid

interface mainly in terms of technology-assisted modes such as Point-of-Sale systems (POS) and wireless devices that employees used to support their tasks but did not necessarily engage or involve the customer.

The hybrid interface of people and machines working together described by Rayport and Jaworski (2005), was similar to the *face-to-face* and *face-to-screen* modes described by Froehle and Roth (2004), as they conceptualized the potential enhancements of using technology to the interaction of customers and employees. A report from Retail Systems Research (Kilcourse & Rosenblum, 2009) presented the areas of opportunity for the introduction of technology based on responses from retailers. Their findings pointed to the significance of technology use for the benefit of customers and employees. For example, 70% of retailers indicated that in-store technologies were important to improving the customer experience, and 49% saw educating and empowering in-store employees with technology as an opportunity to improve the in-store experience. The report advocated 1) the use of information technologies on the selling floor so that customers had access to information as easily as they would on the internet, and 2) enabling store managers with mobile technologies so that they are more visible on the sales floor and able to take on new roles as customer satisfaction managers by responding to the local needs of their customers:

> Because of the fundamental power shift to the consumer in the past decade, retailers have had to rethink their most valuable assets: their people and their stores. When a customer potentially knows more about products and prices than the store employee does, the retailer needs to excel at value-adding services that draw the consumer to the store…And, retailers need to analyze not only what sells, but what doesn't. Their best chance of capturing that information is by engaging in a digital dialogue with the consumer as she browses the store. The 'glue' that makes it all stick together is having a store manager on the selling floor to orchestrate the interaction between consumers and the retailer. It's a real-time job, not driven by daily or weekly cycles, but

> driven by events as they happen. Technologies that enable the store manager and employees to sense conditions and respond to them are important – they represent a winning hand (Kilcourse & Rosenblum, 2009, p.20).

An example of sales floor information technology was one developed by Fastrak Retail (Lewis, 2007). Using digital signage the company developed an on-screen employee or virtual assistant to allow customers to interface with a touch screen while in the store. The system was able to answer product-related questions, show product demonstrations (including a virtual fashion show) and display promotions (Lewis, 2007). The virtual assistant served to engage the customers as if they were interacting with a real store associate and the remote content-management feature allowed retailers to quickly update product information or constantly change promotions for specific brands. This type of self-service technology would be considered machine-dominant (Rayport & Jaworksi, 2005) or technology-generated (Froehle & Roth, 2004) and was a format that Kilcourse and Rosenblum (2009) found to be less preferred by retailers than in the past because the benefits of self-service convenience had not been realized as much by the customer as retailers expected. This suggested that the best applications of technology in the retail store were hybrid formats where customers were in touch with both people (employees) and technology as part of their shopping experience.

The technologies selected for examination in this study represented the latest advances in technology that have been specifically adapted to the apparel retail environment as new concepts. They were not yet widely used and were not merely updates of conventional retail technologies. Conventional technologies in the apparel industry included point-of-sale (POS) systems which evolved from cash registers and hand-held scanners that were capable of reading bar codes for inventory tracking purposes and replaced much of

manual tracking of merchandise once done by store employees, POS systems consisted of hardware and software from companies like Microsoft and IBM that allowed retailers to efficiently process sales transactions and retrieve customer data and used keyboards and monitors resembling desktop computers. Mobile electronics manufacturers like Motorola had developed more sophisticated hand-held scanners (called mobile computers) that provided real-time company-wide inventory levels by detecting RFID tags on garments anywhere in the store (Motorola, 2007). According to Kilcourse and Roseblum (2009), the POS system was the dominant technology interface for customer-employee interaction in retail stores, making the check out counter the major point of interaction.

However, research indicated that retailers wanted to move away from technologies focused at the check out counter to technologies that were used on the sales floor as a means of engaging customers (Kilcourse & Rosenblum, 2009). Retailers wanted to implement more technologies like Motorola's mobile computers so that store employees would have real-time inventory information to provide cross channel service to customers who saw an item online and wanted to see and buy it in a store (Kilcourse & Rosenblum, 2009). Self-service touch points for the sales floor were also desired by retailers so that customers could independently access product information (Kilcourse & Rosenblum, 2009). Digital mirrors have been tested in the apparel industry as a means of providing a self-service touch point for customers while they are inside fitting rooms (Bickers, 2008; Fleenor, 2007). Cisco's *Intelligent Fitting Room* and thebigspace's *Magic Mirror* were examples of this technology, which relied on the information stored in RFID tags placed on garments to display product information on an interactive mirror-like surface inside fitting

rooms. Inside the fitting room, customers could use the touch screen to request help from a sales associate or check the availability of an item. Prada used a similar technology in its stores called the *Smart Dressing Room* (Bickers, 2008) that also allowed customers to save information into their own profile (IconNicholson, 2009). Prada introduced other in-store technologies to complement the *Smart Dressing Rooms* including a mobile device called the wireless *Staff Device* which allowed store employees to check inventory levels and also to activate store monitors to display product images and runway videos for a customer interested in a particular item (IconNicholson, 2009).

Retailers have also explored more virtual technologies as a means of increasing the online shopping experience for customers and marketing their brands. Sears partnered with IBM to develop customer experiences in the virtual community Second Life -- enabling customers' avatars to visit the virtual Sears store and visualize what new appliances would look like in their homes (Reda, 2007). Second Life was a virtual world made up of islands (that could be purchased using its own currency) and populated by avatars who were able to purchase products and services, including clothing. Retailer American Apparel opened a store in Second Life and sold versions of its in-store items as well as virtual jeans for $2 a pair (Reda, 2007).

**Technologies**

The technologies selected for this study represented the three hybrid interface formats (technology-assisted, technology-facilitated and technology-mediated) which involved different degrees of human-computer interaction by employees and customers (Froehle & Roth, 2004) as part of the service encounter. A discussion of these new technologies, their current use, and possible benefits as hybrid technology interfaces in apparel retail stores

follows.

**Body Scanner.** The scanner provided useful information to retailers about store products mostly likely to provide the best fit for the customer. This was done by collecting measurement information from customers by having them enter an enclosed booth where white light, lasers or radio waves were used to establish the shape of the body by capturing thousands of data points. The measurement data collected can then be used for a variety of fit-related purposes for clothing. Customer measurements can be used to create a custom-fitted garment such as a suit or wedding dress. Apparel retailers can also use measurement data from several of their customers to revise specification measurements for clothing in order to improve fit of products or completely re-design them. Measurement data from several customers can also allow retailers to create apparel or a new apparel sizing system specifically for a target market of consumers by only using data from customers identified as part of that market.

Body scanners first became commercially available during the late 1990s. Since that time various scanners with distinct capabilities and customized software were made available to retailers by companies like Intellifit, Human Solutions, $[TC]^2$,Telmat and Cyberware. Intellifit's body scanners were used by apparel retailers like Levi's, Charming Shoppes and David's Bridal (Intellifit, 2006). The Intellifit scanner used radio-waves which reflected off the surface of human skin to provide over 200,000 data points in about 10 seconds. In order to preserve consumer privacy Intellifit's scanner did not produce an image of the consumer's body scan, rather measurement data was stored in Intellifit's database and communicated to the company's retail partners for the purposes of improving the fit of their clothing (Singh,

2005). Lane Bryant used Intellifit's stored measurement data of its customers to develop a new sizing system for jeans in 2007 called *Right Fit* (Shaw,2007). Land's End also used another version of the body scanner developed by $[TC]^2$, which used white light sensors to create a 3D body image and measurements (Bobbin, 2001).

Patricularly interesting to the retailer/customer interaction is size selection application of body scan technology. Software designed for use with body scanners translated the data points into body measurements important to good fit and then compared these measurements with those used by the retailer to advise which sizes and styles will best fit the customer. This was how Levi's implemented the Intellifit scanner in its stores – supporting employees as they helped customers identify Levi's products that would best match their measurements and fit preferences. The scanning process was considered a *technology-assisted format* since only the employee operated or actively used the technology to support the task of finding the right size and style for the customer.

**Product Configurator.** The product configurator was an electronic tool where computer software enables a user to customize apparel by style or color or any other design features the retailer chooses to offer and view the changes virtually. This technology has largely been used by small niche apparel businesses like Timbuk2 (tote and messenger bags), Beyond Fleece (activewear) and by sportswear retailers like Nike, Reebok and Adidas for customized footwear. The configurators were usually web-based for use by on-line shoppers (*technology-generated* customer contact). Lands' End provided customized jeans and khakis to its online customers using product configurators that required customers to enter their body measurements and

then allowed them to select different colors, pocket-types and fit styles (D'Innocenzio, 2002). Product configurators have begun to appear in stores as well, adding another potential point of contact for the customer. Adidas tested in-store customization for its footwear in select stores beginning in 2000 using a product configurator and 3D foot scanner (Seifert, 2002). Nike was one of the first companies to offer an online customization tool for its footwear in 1999 called NIKEiD, and in 2007 they introduced the NIKEiD studio in the company's New York City store. Customers were able to interact with employees known as design consultants who helped them through the 45-minute customization process to create their own footwear or apparel (PR Newswire, 2007). In-store use of the product configurator could provide an opportunity for both the employee and the customer to creatively interact around the product as a *technology-facilitated service interface* (technology used by both the employee and the customer). It had the potential for establishing new job roles for retail employees (similar to Nike's design consultants) and enhancing the desired in-store experiences of customers for customization and consultation.

**Social Networking**. Social networking was a web-based technology that allowed subscribers to communicate with others in their same geographic area, a specific group or network of acquaintances. A social network was also defined as a computer network that connected people (Wellman, 2001). Social neworking was the technology used for web-based services like Facebook, MySpace, or Second Life. Women's retailer, Charlotte Russe introduced a social shopping network called *ShopTogether* in 2007 that allowed customers to invite other users to shop on the retailer's website (Edelson, 2009). Recently, JC Penney launched its own online community for a new lingerie

line in order to gather customer responses to the fit and quality of its new products, asking customers to create profiles, participate in discussion boards, and contribute to online chats with the JC Penney product team (Passenger, 2008). Social networking was also the conceptual foundation for a new in-store technology developed by digital agency Icon Nicholson, called Social Retailing that was tested by Macy's and Nanette Lepore in 2007 and allowed customers to connect to a network of acquaintances via email or instant messaging in order to get real-time feedback from this network on styles that were at that moment being tried on in the store (IconNicholson, n.d.). Social networking was a *technology-mediated interface* which means technology was the only point of contact for employees and customers. This format could be yet another means of developing enhanced or new job roles for employees as design or product "moderators" as they gathered information, as in the case of JC Penney, or as they observed customer comments around the product as with Social Retailing.

An understanding of how employees responded to technologies like the body scanner, social networking or the product configurator was essential for successful future widespread implementation within stores. It also was essential for the preparation of an engaged, technologically educated retail workforce (Swinyard, 1997) who were satisfied with their jobs and able to meet customer satisfaction and experience expectations.

**Technology Acceptance Model**

The three selected technologies in this study were new to the apparel retail industry and not yet widely used, so much of their intended value in the store environment had not been evaluated. Even if a retail company determined that a technology would be valuable for its business, there was no

guarantee that employees or customers would use it. Bickers (2008) reported that the eventual failure of the Smart Dressing Rooms at the Prada flagship store in New York City's SoHo neighborhood was due in part to bad attitudes towards the technology by store employees, or *employee sabotage*. These dressing rooms were able to detect information contained on RFID (radio frequency identification) tags and labels inside a garment when it was brought into the dressing room and then displayed images and product information related to the item on monitors. This access to information could have been useful to customers and perhaps saved employees time explaining product features or details; however, this technology might have appeared to replace tasks normally performed by retail employees or add pressure to an already frantic retail salesperson's daily activities. This example illustrated the importance of gauging employee reaction and intent to use new in-store technologies before making the technologies a part of the work environment.

Willingness to adopt new technologies was researched by Davis, Bagozzi and Warshaw (1989) applying the Technology Acceptance Model or TAM, which is based on the Theory of Reasoned Action, a theory of social psychology which measures the strength of one's intentions upon actual behavior (Ajzen and Fishbein, 1980). Perceptions of usefulness and ease of use were the two main premises of the TAM and were theorized to influence attitude and behavior towards use of a new technology (Davis et al., 1989). Usefulness was how much users believe that using a technology would improve job performance. Ease of use referred to how much users felt that using a technology would be free of effort (Davis,1989) and was influenced by the users' levels of technology self-efficacy, or how comfortable they felt using a computer or other technology (Davis, 1989; Venkatesh and Davis, 1996;

Compeau and Higgins, 1995).

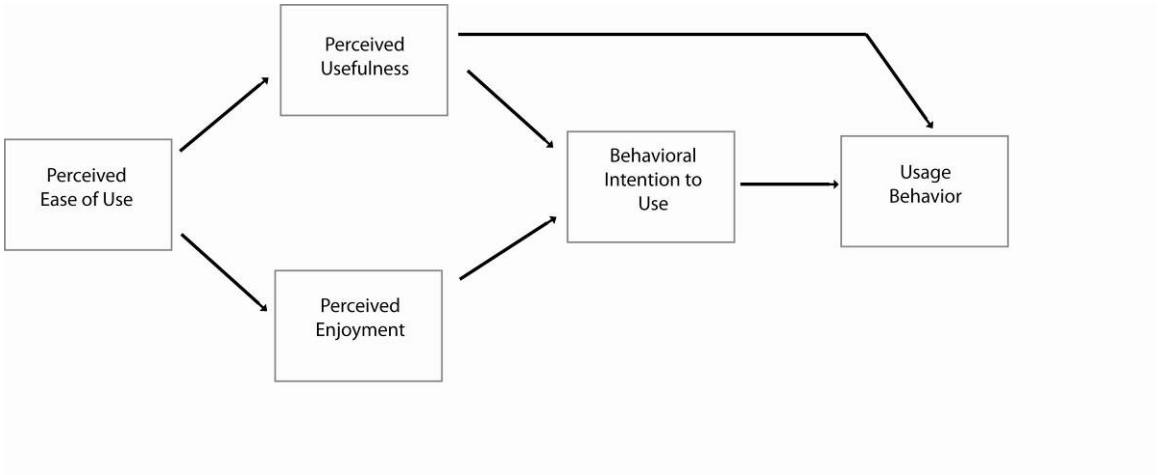


**Figure 2.1. Technology Acceptance Model (Davis et al. 1992)**

In later research using the TAM to study intrinsic and extrinsic motivations for computer usage among MBA students, Davis, Bagozzi and Warshaw (1992) found that usefulness and enjoyment were significant predictors of intention (see Figure 2.1). Perceived enjoyment was defined as the user's determination of how much fun would be derived from using the technology irrespective of its functionality or expected output. Davis et al. (1992) also evaluated task importance, or how important technology was to one's job as a moderating variable of the influence of ease of use on usefulness. As a moderator, and not a core variable of the TAM, task importance was not included in the TAM model. Usefulness and enjoyment combined were found to have a significant impact on users' intended use while usefulness was shown to influence intentions four to five times more than enjoyment (Davis et al., 1992). Task importance was also found to significantly moderate the effect of ease of use on usefulness. These findings indicated

that users would not necessarily adopt a new technology for work just because it was fun or novel, but there must also be a strong component of utility in terms of what the technology can do to support job tasks. Perhaps this model would explain why Prada employees did not view smart dressing rooms as valuable -- because the technology was viewed as complicated, not fun and/or not supporting their work.

The Technology Acceptance Model (TAM) was tested among salespeople to measure the factors influencing their adoption of technology used for daily activities (Robinson, Marshall & Stamps, 2005) and results supported the TAM. Lee, Fiore and Kim (2006) used the TAM to evaluate responses to retailer websites with a sample of undergraduate college students and found that all variables of the TAM were supported. The TAM variable *perceived ease of use* was tested by Mathieson and Keil (1998) using business students and they found that the interaction between the type of database used and task importance significantly influenced perceived ease of use. A field setting was used by Lucas and Spitler (1999) to test use of computer work stations among brokers and sales assistants in an investment bank using the TAM model. The participants used computer software that was directly related to their jobs but results did not support the TAM model (Lucas & Spitler, 1999). Szajna (1996) conducted a longitudinal study to measure the TAM variables and later actual use of e-mail and confirmed that the TAM model was able to predict actual usage behavior based on intention.

The technologies evaluated here are distinct from those used in previous studies which tested common software programs or technologies that people were already familiar with (email, instant messaging or electronic organizers). Since the technologies examined in this study were not yet widely

used in the context of apparel retail, testing the core relationships of the Technology Acceptance Model with less familiar and more advanced technologies in that context was a significant contribution to the literature.

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# CHAPTER 3

# METHOD

## Research Problem

Employee job dissatisfaction and low levels of customer satisfaction with service in apparel retail stores provided a strategic opportunity for technology use. This study was conducted to evaluate the willingness to use new apparel industry technology from the perspective of retail employees. Employee intention to use these new technologies was evaluated using the Technology Acceptance Model (Davis, Bagozzi & Warshaw,1992). The degree of confidence employees felt when using technology, as well as their attitudes towards customers (service orientation), store type and job position were additional variables investigated for their influence on intention to use these new technologies.

Based on the Technology Acceptance Model (TAM), the following relationships were hypothesized:

**H1**: *Perceived usefulness and perceived enjoyment will have significant effects on employee behavioral intention to use technology.*

**H2**: *The effect of perceived ease of use on employee behavioral intention to use technology will be mediated by both perceived usefulness and perceived enjoyment.*

**H3**: *Task importance will moderate the effect of perceived ease of use on perceived usefulness but not on perceived enjoyment.*

Placing this study in the context of actual retail workers meant that other occupation-related factors could influence how employees perceived

technology and its value. Findings by Rhoads, Swinyard, Geurts, and Price (2002), showed that retail store workers were more dissatisfied than retail corporate workers and indicated that there could be different factors that influenced workers based on their position within a company. For example, a sales manager may find a particular technology more useful than a sales associate if it provided her with more time to complete administrative paperwork. Similarly, an employee who started out with an entry-level retail position but if he or she has decided to make a career in retail, and was motivated to achieve a higher position, the employee may show greater inclination towards adopting new technologies as part of extrinsic motivation (i.e., a better job). Noe (1995) hypothesized that the closer an employee was to his or her career goal, the more likely he or she would be to engage in development activities. However study results did not support this hypothesis. Instead results indicated that employees further away from their career goals showed greater interest in and motivation toward development behaviors (Noe,1995). Noe's original hypothesis and the contradictory findings prompted a research question rather than a directional hypothesis.

**R1:** *Will current employee job level influence behavioral intention to use in-store technology?*

Customer service was another important component of the retail store environment and studies demonstrated that both customers and employees were generally unhappy with it. If an employee already had an interest in helping customers or enjoyed the "people" factor of working in retail (service orientation), he or she might find technology useful for enhancing interactions or providing an enjoyable alternative format for building customer relationships. However, if an employee did not value customer interactions,

technology was not likely to change this aspect of his or her personality.

**H4**: *Employee service orientation will moderate the effect of perceived usefulness and perceived enjoyment on behavioral intention to use in-store technology.*

How confident employees felt towards using technology, or their self-efficacy, could influence how they perceived a technology's ease of use (Venkatesh & Davis, 1996) and therefore influence how useful and/or enjoyable they perceived a technology. Employees would need to feel confident using a technology first in order to view it as easy to use, able to improve their job performance or even fun to use. If a new technology was adopted by a company and employees immediately perceived it as too cumbersome or complicated, the technology would be destined to fail as seen in the case of Prada's smart dressing rooms.

**H5**: Perceived ease of use will mediate the influence of *employee technology self-efficacy on perceived usefulness and perceived enjoyment.*

The type of technology that the employee interacted with could also influence his or her intention to use it. As hybrid interfaces, each technology tested represented a mix of human and computer contact but two of the technologies still involved face-to-face contact between the customer and employee (body scanner and product configurator) which could be preferred by employees who enjoyed interacting with their customers.

**H6**: *Apparel retail employees with high service orientation will show greater intent to use Technology Assisted customer contact (body scanner) and Technology Facilitated customer contact (product configurator) formats than intent to use Technology Mediated customer*

*contact (social networking).*

Both the product configurator and social networking were technologies that supported new job roles for apparel retail employees (i.e. design consultants or moderators), while the body scanner supported a job role that already existed in apparel retail stores – that of the "fit expert". Employees received the designation of "fit expert" once they had developed extensive knowledge about the store's product and could successfully determine which size and style would best fit the customer. The body scanner effectively supported this role and could even enhance the employee's knowledge. So, employees who indicated an interest in design-related or fit expert job roles could view these new technologies as part of their development.

**H7**: *Apparel retail employees who indicate a higher interest in design roles will show greater intention to use the product configurator and social networking than employees not interested in design roles.*

**H8**: *Apparel retail employees who indicate a higher interest in fit expert roles will show greater intention to use the body scanner than employees not interested in fit expert roles.*

## Research Design

This study was an extension of research done by Davis et al. (1992), which evaluated users' perceptions of a software program after using it. Data were collected from a sample of apparel retail store employees who interacted with three innovative technologies identified as having small but emerging uses in the apparel retail industry. The three technologies selected for examination in this study represented advances in technology that were specifically adapted to the apparel retail environment, were not yet widely used and were not merely updates of conventional retail technologies. They also represented the three hybrid interface formats (technology-assisted, technology-facilitated and technology-mediated) proposed by Froehle and Roth (2004) to describe human-computer interaction for customer service encounters.

The technologies were set up at two research sites (see Appendices H and I) and data were collected using a questionnaire administered to participants after their introduction and use of each technology to assure that knowledge of the technology and its application for retail was the same for all participants. The independent variables from the TAM model applied to predict behavioral intention (BI) were perceived ease of use (EOU), perceived usefulness (USF), perceived enjoyment (ENJ) and task importance (TASK). Additionally, perceived usefulness and perceived enjoyment were treated as dependent variables in order to measure main effects and interaction effects of perceived ease of use on these two variables. Technology self-efficacy and service orientation were independent variables not in the original Davist et al. (1992) research but were added to the model for this study (see Figure 3.1).

*Technologies.* The research site was set up with a body scanner and

two laptop computers. The body scanner selected was $TC^2$'s NX-12 model, which was operated through a desktop computer loaded with 3D measurement software developed by $TC^2$ for producing an image of the scanned person and extracting measurements. The $TC^2$ body scanner was selected since it had already been used by apparel retailers like Land's End and Brooks Brothers and so represented the type of scanner that a retail employee might use in a store.

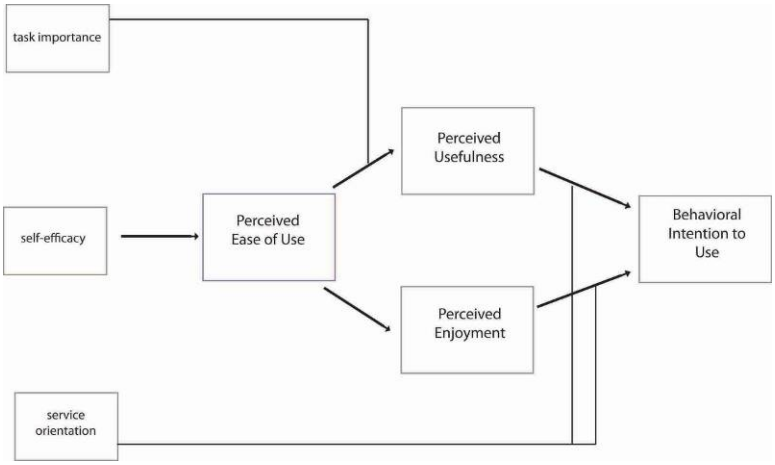


**Figure 3.1. Adapted Technology Acceptance Model showing interactions**

computers and sensors, and finally the outer coverings were applied (see Figure 3.2). After assembly, the scanner was calibrated and before each day's research session, the scanner calibration was checked using the tolerance parameters allowed by the software program. Once calibrated, the scanner could be repeatedly demonstrated to study participants. The body scanner has been used in apparel retail stores to collect measurement data and recommend sizes and styles to customers. It is not yet used on a mass scale in apparel stores in spite of its usefulness for providing size and fit information. The body scanner tested how the technology could be more broadly applied in apparel stores as part of a retail employee's work.


**Figure 3.2. Body Scanner assembly and final display at research site**

One laptop was used for the product configurator and the other for social networking, although both of these technologies were web-based and interactive, in this study participants were not able to connect to the Internet in order to limit the effects of interactivity or possible problems with Internet connectivity. The product configurator software was downloaded from online (www.digikids.cornell.edu) to the computer so that it would be operable offline (see Figure 3.3).

The product configurator was located on an existing website that had been developed as a research site for a previous study on consumers and mass customization. The site was chosen because it possessed functions and appearance similar to commercial online product configurators. Previously, this website had only been tested among consumers but it provided context for retail employees.

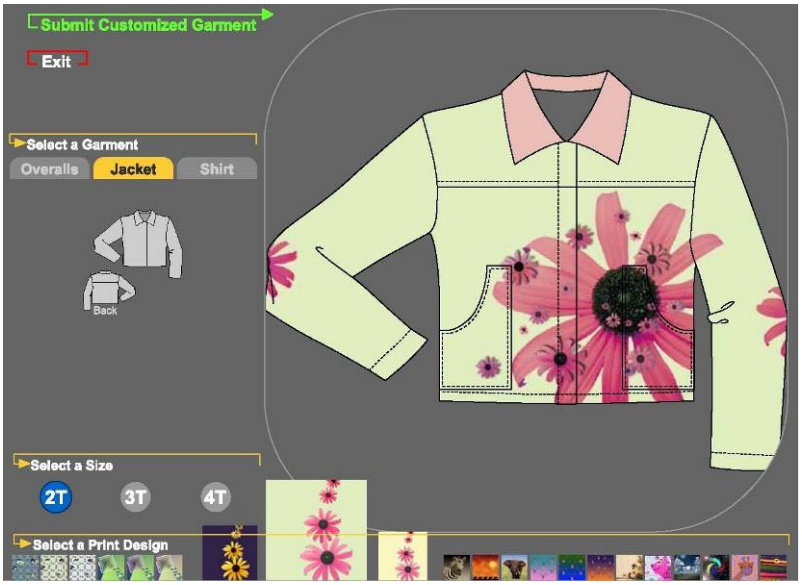


**Figure 3.3. Jacket design page from Product Configurator**

The website contained computer-generated illustrations of three children's styles – a t-shirt, a jacket and overalls. Each style was visible on a different page and could be selected by clicking on a tab with the name of the style. Style options for adding a pocket to the t-shirt or jacket were available, along with front and back view of all the styles and size choices. Print options for each garment were displayed along the bottom half of the screen and when selected, the print would be shown on the garment.

The social networking site was developed by the researcher using Adobe InDesign software which allowed for the creation and editing of a website without launching it to the Internet. It was created by the researcher since Internet connectivity was not available at the research sites and it was not possible to capture the functions of an existing social networking site offline. The site appearance was designed to be similar to Facebook (see Figure 3.4) but was titled *fashion network*. Instructions indicated that the site was to be used to contact customers only so that participants did not perceive the site as exactly the same as social networking used for personal

communication. Retailer interest in using social networking had increased as companies like JC Penney, Charlotte Russe, and Nanette Lepore began to explore its capabilities for both online and in-store use, so it was beneficial to test this technology among retail employees who may encounter this technology as part of their work.

The social networking site consisted of an introduction page with the title *Fashion Network* and had two radio buttons – one for womenswear and the other for menswear (see Figure 3.4).

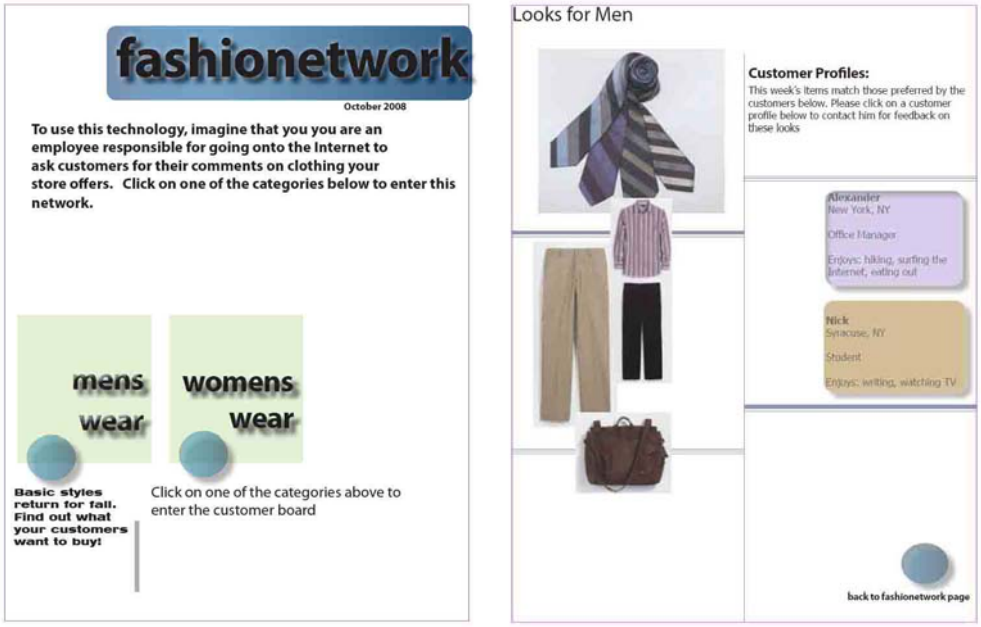


**Figure 3.4. Social Networking Introduction and Customer Profile Pages**

### Instrument

The radio buttons were linked to a page containing images of clothing

outfits for the selected category (mens or womens) along with two fictitious customer profiles, providing name, hometown, profession and favorite activities of the customer. Instructions on the page explained that the outfits shown matched the customer profiles displayed and that each customer was to be contacted to request his or her opinions of the outfits by clicking on the profile. The profile was then linked to a sample message that asked the customer for feedback and thanked him or her for participating. Another radio button at the end of the message instructed users to select it when finished reviewing the message. This final radio button linked to a page that indicated that the message had been sent and the user could return to the homepage.

A questionnaire was developed by the researcher to include measurement scales for testing the hypothesized relationships of the TAM model (Davis et al., 1992) for each technology as well as the influence of service orientation and technology self-efficacy on variables included in the model. The questionnaire included four sections with scales to measure service orientation and technology self-efficacy in section one. In section one, participants were also asked to indicate the name and category of the store where they worked as well as whether they worked as a part-time or full-time employee. Section two consisted of scales to measure the TAM variables of task importance, perceptions of ease of use, usefulness, enjoyment as well as behavioral intention for each technology and the third section consisted of five open-ended questions. Sections two and three of the questionnaire consisted of two pages for each technology (see Appendix C). The set of Technology Acceptance questions presented for each of the different technologies was slightly modified from the original scales in order to accommodate the name and function of the technology. For example, the task importance question

was modified from the Davis et al. (1992) survey to describe the specific task that each technology in this study would support for a retail employee (see Appendix C).

The five open-ended questions were developed in order to probe participants' reactions to technology and how they felt each technology would change their work experience. The following questions were posed:

*(1) How would you imagine this technology helping you do your job better?*

*(2) How would using this technology make your job more interesting?*

*(3) How would using this technology change the way you work with customers?*

*(4) If you could make the decision to adopt this type of technology, why would or wouldn't you put this technology in your store?*

*(5) Any other comments about the relevance of this technology to your job?*

Demographic and job information was collected in section four and focused on variables that could influence career development, service orientation or technology self-efficacy such as participant job title, age, education, career goals and personal technology use.

Service orientation items taken from the five 5-point customer orientation items developed by Susskind, Kacmar and Borchgrevink (2003) were used to measure customer service attitude ($\alpha$ = .91). The ten-item 10-point computer self-efficacy measurement ($\alpha$ = .95) developed by Compeau and Higgins (1995) was applied using the original wording of the items to measure employee technology self-efficacy. Variables related to the Technology Acceptance Model (Davis et al., 1992) were measured using six 7-point items for perceived usefulness( $\alpha$ = .97) and six 7-point items for perceived ease of use ($\alpha$ = .91), both developed and validated by Davis

(1989). From Davis et al. (1992), three 7-point items for perceived enjoyment ($\alpha$ = .92), one 7-point item for task importance and two 7-point items for behavioral intention ($\alpha$ = .88) were used. These items for the measuring the TAM variables were adapted to the technologies used for this study, which included changing the description of task importance to relate to retail job tasks associated with each technology. Also a set of questions containing all the TAM variables were developed to test each technology so that there were three separate sets of questions for section two and three.

Career aspiration measures included one item for the employee to indicate current job position and another item to indicate his or her highest job position desired -- job position labels were based on the National Retail Federation's career ladder (see Appendix F). Additionally, one 5-point item from the Focus scale of the Career Exploration Survey (Stumpf, Colarelli, & Hartman, 1993) was used to measure employee certainty of highest desired job position and one 5-point item adapted from the Method Instrumentality scale of the CES was used to measure how each technology would aid in reaching the desired job position. Two 5-point items were developed to measure employee interest in new job roles as a design consultant and a fit expert.

## Pilot Study

A pilot study was conducted at a university lab site to test the clarity of questionnaire items to participants, the procedures for using each of the technologies, as well as any issues with their functionality or usability. Three graduate students in the field of apparel and textiles (1 male and 2 females) along with five female participants enrolled in a retail training program at a local community center took part in the pilot study. Participants were asked to

identify any confusion or uncertainty regarding the wording of questions and the use of each technology during the process of completing the study. The researcher seated all the participants at the same table while using the laptop-based technologies and while completing the questionnaire so that questions could be easily answered regarding either the technologies or the questionnaire items. The researcher randomly assigned the order of use for each technology for each person and recorded the amount of time needed to complete each section of the questionnaire in order to determine the amount of time and number of slots needed to schedule participants for the study. The results of the pilot study determined that it would take approximately 20 to 30 minutes for completion of the study depending on how long it took respondents to answer the open-ended questions. The pilot study also revealed the challenges of conducting the study with more than one participant at once and it was determined that the maximum number of people participating at the same time was three in order to avoid waiting time. The possibility of problems with Internet connectivity and use of an interactive web-based program were also raised during the pilot study since the Internet connection could not be consistently maintained at the lab site and participants were able to view information entered by a previous participant on the social networking site. The technologies were run offline during the study in order to maintain consistent treatments.

Additional pilot study findings included spelling revisions and questionnaire formatting that would allow for use with the random order assignment for use of each technology. For this, the questionnaire had to be administered in sections to each participant instead of as one set of connected pages. To accomplish this, the researcher placed copies of sections at

different stations so that participants only completed the appropriate section while using a particular technology and they were instructed to take the completed page to the next technology. The researcher gave each participant a clip board to hold the pages and collected the pages after participants used all three technologies.

## Procedure

When participants arrived at the research site, they were seated and asked to read the consent form (see Appendix B) and afterwards complete section one of the questionnaire. Before beginning use of the technologies, they were also assigned a subject number, which was written in the top right corner of the questionnaire. To reduce the possible influence of order effect on the study, a random number list was generated using the six possible combinations of the numbers 1-2-3 for subject numbers 1 through 100 (1=body scanner, 2=product configurator, 3 = social networking). When participants were assigned a subject number, they were also assigned an order to use the technologies, for example number combination 2-3-1 would require use of the product configurator first, followed by social networking and finally the body scanner. Numbers were also posted at each computer station to make sure that participants were directed to the correct technology in the event that multiple participants were engaged at the same time.

Once participants completed section one, they were directed to one of the three technologies and provided a verbal scripted description of how the technology worked by the researcher (see Appendix D). They were also given a demonstration of how to use the technology by the researcher. Explanations and demonstrations of technology were done individually with each participant. Participants were shown how to use each technology by the researcher to

ensure some level of knowledge among participants and they were then instructed to independently use each technology with short written directions as aids. Participants were told to complete the questionnaire section after using the technology.

After using the technology and filling out the corresponding questionnaire, the participant was directed to the second and third technologies to repeat the process. The researcher collected participants' questionnaires after they used all three technologies and placed them with section one. After the participants finished using the last technology, they were given the last section of the questionnaire to fill out and once this was completed, the researcher thanked the participants and issued compensation for taking part in the study. The last section of the questionnaire (section four) was added to the other completed sections and all pages were stapled together and the subject number marked off the list containing subject numbers and technology use order. Completed questionnaires were removed from the research site at the end of each day and placed in the researcher's locked file.

**Sample Recruitment and Description**

*Site One.* Data were collected from adults with work experience in an apparel retail store, either past or present. A large mall in Central New York was the first site selected for data collection since the technologies required a significant amount of space and it was thought that a large number of stores would yield a higher number of available participants. Also retail employees would have access to the technologies and sufficient time to complete the study without having to leave the mall. Participants were recruited for the mall study using flyers distributed by the main mall office one week in advance of

the start of the study. The flyers described the study, the types of technology and an incentive of entry in a raffle for one of three $50 giftcards plus a $5 giftcard for a local restaurant for everyone who came to complete the study. This study site was set up for one week and was open according to mall operating hours.

*Site Two.* A second study site was set up after data were collected from site one where total participation was low. A laboratory space near both a university and shopping mall was used so that students and retail workers would be able to participate as well. This site also allowed for more effective recruitment of retail workers who wanted to participate before or after work hours since the researcher had access to the site 24 hours a day. Participants were recruited via university email lists, the research recruitment website of the university's psychology department, the local classified website for Craigslist, and through visits to local retail stores --all were offered a $20 incentive to complete the study. This incentive was offered due to the travel distance to reach an off-campus lab, the amount of time participants would spend completing the study, and the difficulty in attracting participants at the first site with a raffle and giftcard incentive. In email and web advertisements for recruitment, participants were advised of the purpose of the study, the technologies to be used, the location, time required and that work experience in a clothing store was necessary in order to take part in the study. Once participants contacted the researcher with interest in completing the study a reply email was sent asking him or her to name the store where they had worked and for approximately how long, as well as a suitable time when they could come to the research site.

*Sample Description***.** A total of 71 participants completed the study

between the two sites – 10 at the mall site and 61 at the laboratory site. The sample included 56 females (78.1%) and 15 males (21.1%). Ages of participants ranged from 16 to 66 years old with the majority of the sample between the ages of 16 to 21 (59.2%). Most of the participants had received some post-secondary education with 39 participants (54.4%) reporting some college education (included students currently enrolled). Most of the sample worked part-time (73%) and there were 41 participants (57.8%) who were currently working in a retail store with 18 employed as a sales associate (25.4%) and 23 as store managers (32.4%). Those working in stores with one product category, which could include men's, women's or children's clothing were placed into a group called Specialty (51%, *n* = 32), and those working in stores with more than one product category were placed into a group called All (48%, *n* = 34). There were 30 participants (42.3%) with apparel retail work experience who were not currently working in a retail store.

**Data Analysis**

*Factor Analysis*. The technologies used in this study were different from the word processing software tested by Davis et al. (1992). In order to verify the internal consistency of the TAM variables for the technologies chosen for this study, factor analysis with varimax rotation was conducted for each technology using the three TAM variables Davis et al. (1992) used in their original factor analysis -- perceived ease of use, perceived usefulness and perceived enjoyment. All items loaded on the appropriate single factor except three items for the product configurator's perceived ease of use scale. These three items also appeared to load on a second factor resulting in lower variance explained by ease of use (17.7%) and more variance explained by enjoyment (23.7%) for the product configurator (α =.79) than factor loadings

for the other two technologies (see Appendix E). To be consistent with the Davis et al. (1992) research, all items were used in the data analysis as developed.

*Mean Comparisons*. One-way ANOVA analysis and t-tests were conducted for comparison of mean scores for each of the Technology Acceptance Model variables (perceived ease of use, perceived usefulness, perceived enjoyment, behavioral intention and task importance). Once significant differences were found with the ANOVA results, post-hoc analysis with Tukey's HSD was used to determine which specific technologies were significantly different for each variable. One-way ANOVA and t-tests were also used to test the influence of the categorical independent variables (age, gender, education, current job, store type, hours worked and number of personal technologies used) on participants' behavioral intention to use each technology. To answer research question one (R1), how employee job position influenced intent to use technologies, ANOVA tested for differences among participant intent to use each technology based on their current job and highest future job position.

*Multiple Regression.* Hypotheses 1 through 4 were tested using multiple regression analysis, following the hierarchical regression method used by Davis et al. (1992) to evaluate relationships among the TAM variables. Hierarchical multiple regression was able to detect which combination of the independent TAM variables and interaction effects would make the best prediction of behavioral intention. Since participants completed separate questionnaires for body scanner, product configurator and social networking based on the variables of the Technology Acceptance Model (perceived ease of use, perceived usefulness, perceived enjoyment, behavioral intention and

task importance), separate analyses were conducted for each technology. Simultaneous regression was used to test hypothesis 1. Hierarchical multiple regression was used to test hypothesis 2, including the contribution of the mediating effects predicted in hypothesis 2. The hierarchical multiple regression method was also used to detect the moderating effects of task importance on usefulness and enjoyment (H3) and the moderating effect of service orientation on behavioral intention (H4). Hypothesis 5 was also tested using hierarchical multiple regression to evaluate the influence of technology self-efficacy on usefulness and enjoyment through ease of use. Independent variables were evaluated for multicollinearity (see Table 3.1, Table 3.2 and Table 3.3) to identify any possible correlations among the variables used in the multiple regression analysis. Significant but weak correlations were found among some of the independent variables. For all three technologies, the highest correlations were found between the dependent variable *behavioral intention* and the independent variable *usefulness* ($r^2$=.70, $r^2$=.71, and $r^2$= .73). The collinearity statistics for the independent variables showed that multicollinearity did not present a problem for the data since results showed tolerances were above .40 and the variance inflation factors were low (less than 3). Strong correlations among independent variables can be problematic for the interpretation of multiple regression results. Specifically, the interpretation of regression coefficients may be misleading due to multicollinearity (Parasuraman, Grewal & Krishnan, 2004).

**Table 3.1 Correlations for Adapted Technology Acceptance Model variables (Body Scanner)**

| **Body Scanner** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | EOU | USF | ENJ | BHV INTENT** | TASK | SO | TECH SEFF |
| Ease of Use | - | | | | | | |
| Usefulness | .47* | | | | | | |
| Enjoyment | .37* | .34* | | | | | |
| Behavioral Intention | .33* | .70* | .43* | | | | |
| Task Importance | .33* | .42* | .21* | .46* | | | |
| Service Orientation | .33* | .01 | .04 | -.07 | .22* | | |
| Technology Self-Efficacy | .35* | .49* | .21* | .30* | .23* | .28* | - |
| **Collinearity Statistics** | | | | | | | |
| *Tolerance* | *.62* | *.53* | *.82* | - | *.77* | *.76* | *.68* |
| *VIF* | *1.61* | *1.88* | *1.22* | - | *1.30* | *1.32* | *1.47* |

Note: *correlations significant at p<.05 ; ** dependent variable; *N* = 64

**Table 3.2 Correlations for Adapted Technology Acceptance Model variables (Product Configurator)**

| **Product Configurator** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | EOU | USF | ENJ | BHV INTENT** | TASK | SO | TECH SEFF |
| Ease of Use | - | | | | | | |
| Usefulness | .57* | | | | | | |
| Enjoyment | .49* | .43* | | | | | |
| Behavioral Intention | .42* | .71* | .35* | | | | |
| Task Importance | .24* | .59* | .31* | .59* | | | |
| Service Orientation | .17 | .09 | .03 | .21* | .19 | | |
| Technology Self-Efficacy | .31* | .38* | .19 | .29* | .35* | .27* | - |
| **Collinearity Statistics** | | | | | | | |
| *Tolerance* | *.55* | *.44* | *.71* | - | *.59* | *.89* | *.78* |
| *VIF* | *1.82* | *2.29* | *1.41* | - | *1.71* | *1.13* | *1.29* |

Note: *correlations significant at p<.05 ; ** dependent variable; *N* = 61

**Table 3.3 Correlations for Adapted Technology Acceptance Model variables (Social Networking)**

| **Social Networking** |
|---|

| | EOU | USF | ENJ | BHV INTENT** | TASK | SO | TECH SEFF |
|---|---|---|---|---|---|---|---|
| Ease of Use | - | | | | | | |
| Usefulness | .31* | | | | | | |
| Enjoyment | .26* | .41* | | | | | |
| Behavioral Intention | .17 | .73* | .32* | | | | |
| Task Importance | .16 | .48* | .30* | .71* | | | |
| Service Orientation | .25* | .33* | .18 | .31* | .17 | | |
| Technology Self-Efficacy | .10 | .36* | .44* | .35* | .32* | .34* | - |
| **Collinearity Statistics** | | | | | | | |
| *Tolerance* | *.85* | *.62* | *.71* | - | *.74* | *.81* | *.70* |
| *VIF* | *1.18* | *1.60* | *1.41* | - | *1.35* | *1.24* | *1.44* |

Note: *correlations significant at p<.05; ** dependent variable; *N* = 65

*Linear Mixed Model*. While the Davis et al. (1992) procedure served as a guide for replicating the study and testing the effects of the TAM variables for each of the technologies selected for this study, it was useful to compare the technologies and the influence of the TAM variables in a single model. This would allow for assessment of the variation among the participants and among the three technologies used in order to compare the results with the multiple regression output that was run for each technology. The model was able to handle correlated data, which may occur with repeated measures (such as use of the three technologies) and unbalanced data.

The Mixed procedure in SPSS was used to further examine the influence of the TAM variables on behavioral intention. This post-hoc analysis resulted in a mixed model that was able to accommodate both the fixed effects (within subjects) of the variables measured for each technology and the random effects (between subjects) of subject-to-subject variance. The benefit of the model was that it provided a larger overall profile of the dataset without having to run various analyses. Variables entered into the model included: technology type, perceived ease of use, perceived usefulness, perceived

enjoyment, service orientation, and task importance.

For comparison with the multiple regression results conducted for each technology, interactions were also entered into the model to account for the possible effect of technology type with each of the following variables and interactions: *perceived ease of use, perceived usefulness, perceived enjoyment, service orientation, task importance, perceived ease of use x task importance, enjoyment x task importance, perceived usefulness x task importance, perceived usefulness x service orientation, perceived enjoyment x service orientation*, and perceived *ease of use x service orientation*. Non significant variables and interactions were removed from the model in a stepwise manner beginning with non-significant higher order interactions (i.e. technology type x perceived usefulness x service orientation) and the analysis repeated with the remaining significant variables until the model contained only significant predictors. The linear mixed model provided another way of looking at the data and suggested additional interesting findings not included in the model that could be tested with other emerging technologies across hybrid typologies.

*Regression*. Simple Linear Regression tested the influence of service orientation on behavioral intention for each technology (H6). Hypotheses 7 and 8 were tested with regression analysis in order to evaluate the influence of participants' interest in new job roles on behavioral intent to use each technology.

*Exploratory Analysis*. The GLM procedure in SPSS was used to determine the effect of participants' career goals on perceived usefulness and behavioral intention accounting for certainty of career goal and certainty that using technology would help participants reach the career goal. Career goals

were determined by calculating the difference between the participant's current job and the highest job position he or she desired in the future and a new variable called *delta job* was created, where higher values indicated a larger distance from one's career goal. GLM was also used to test the influence of service orientation on behavioral intention and usefulness for each of the technologies, controlling for both store type and the employee's current job position. GLM was chosen to conduct these analyses since it helped reduce the error that may result from testing effects on behavioral intention and usefulness separately. GLM allowed for examination of multiple dependent variables that could be related. Specifically, Davis et al. (1992) found that both perceived usefulness and behavioral intention had direct positive effects on actual technology usage and that usefulness could also influence actual technology use through behavioral intention.

*Content Analysis*. Participants were asked to complete a separate set of open-ended questions for each of the three technologies after responding to the TAM questions. Open- ended questions were transcribed from section three of the questionnaire for each subject by technology type. This was done using an Excel spreadsheet so that all responses for the three technologies could be easily reviewed together. The researcher did not develop any preconceived expectations regarding findings for the five questions, rather all questions were reviewed for key terms that were found in the responses. Questions were reviewed for key terms or phrases and they were listed by the researcher during the review process. Terms and phrases were compared for redundancy and similar terms and phrases were combined under a single, broader word or phrase called a theme. For example, if a participant wrote that a technology "would help me help a customer" it was coded as *service.*

Similarly if a participant wrote “it would help me work more quickly” or “not waste time” the response was coded as *efficiency*. More than one key term was sometimes found in a single response and was then coded on more than one key term. Similar terms were combined and the responses were reviewed a second time to verify the assignment of relevant terms to responses. Once terms were assigned, they were then coded for frequency of occurrence and the data were examined for emerging themes. Responses to question five, which asked participants to provide any additional comments for each technology, were counted among similar responses by each subject for questions 1 through 4 since it was noted that most participants repeated or expanded on comments made in earlier questions in question 5.

Themes were divided into *within technology* and *between technology* categories. *Within technology* themes represented unique characteristics that participants only attributed to one technology and *between technology* themes represented common characteristics found across all three technologies. Themes were compared using transcripts for each set of questions by technology type to determine within technology themes. Then all three sets of transcripts were compared to determine between technology themes.

## Limitations

The limitations of the study included the use of a convenience sample of participants who were able to come to the two research sites. Testing of the technologies in an actual retail store setting might prove beneficial for future studies so that more people would have the ability to participate. Also, over 40% of the participants in this study were not currently working in an apparel retail store and over 70% worked part-time. Participants may not have been working due to various reasons (temporary/seasonal worker, decided to leave

job, did not like working in retail) and this may have influenced their responses. None of these possible influences were measured or controlled for in this study. A study consisting of more employed, full-time retail workers might provide different results for intention to use the technologies selected for this study since they may have more of an interest in retail or how technology could influence their work. This study did not take into account the previous years of apparel retail work experience for participants, which could also influence employees' perspectives and knowledge regarding the apparel retail industry overall as well as awareness of procedures and processes where technology might change how one works. Also store types consisting of one product category, or Specialty stores, for this study were mostly women's specialty stores, so the generalization of results for other categories of specialty apparel stores (men's or children's) was not possible.

The sample was dominantly female (78%) but this proportion was close to that reported for employees in the apparel industry in the United States which was 75% (US Department of Labor, 2009). This study did not collect data on the ethnicity of participants. The generalizability of the results to the population of apparel retail store employees in the US was not possible due to sample limitations.

Another limitation was the use of an existing research website for the product configurator. This website was designed to test the appeal of customizing children's clothing so all of the style images and prints were in the context of childrenswear. Based on several responses to open-ended questions, this seemed to have influenced how some participants perceived the technology and its usefulness, especially if their work experience did not include work in a children's store or department. Future research should

include a variety of products and age-based designs to appeal to participants with experience working in several different apparel product categories.

## Results

The results of this study will be presented in the following chapters as three articles. The topics of these articles examined apparel retail employees' intent to use technology for their current jobs, possible applications of technology for career development and future uses of technology in apparel retail stores.

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## CHAPTER FOUR

# INNOVATING WORK: FACTORS INFLUENCING RETAIL EMPLOYEE INTENT TO USE NEW APPAREL INDUSTRY TECHNOLOGY

## Introduction

Apparel retail employees experienced low levels of job satisfaction and negative customer service ratings from consumers. Gaps in service quality and job satisfaction provide an opportunity for the introduction of technology to support and engage employees in their work. This study evaluated retail store employees' intent to adopt advanced technologies that allow for increased customer contact and new job roles. The Technology Acceptance Model served as a theoretical framework for evaluating employees' behavioral intention to use the three emerging technologies examined in this study: a body scanner, product configurator and social networking. The results showed that the usefulness of the technology was a main influence on intent for all three types. Implications, retail applications for each of the technology types and future research are discussed.

Technology can be incorporated into the apparel retail store to give store employees more opportunities to initiate contact with customers, to support existing responsibilities, and potentially to increase their efficiency. For example, wireless headsets or radios currently used in stores allow retail employees in different areas of the store to talk to one another in order to quickly respond to customer inquiries or search for merchandise. The coordination of store service aided by wireless devices and hand-held scanners used by shipping companies like FedEx or retailers like Target are also examples of what Rayport and Jaworski (2005) called "hybrid" interfaces – where people are supported by technology as they work in service situations. Hybrid interfaces were different from other technologies that were used to substitute retail employee work, such as self-serve kiosks that allowed

customers to check item prices instead of asking an employee.

Specifically, this study examined three different types of emerging technology in the apparel retail industry: a body scanner, product configurator, and social networking. The likelihood that employees would use the technologies and employee characteristics that influenced the extent of in-store technology was measured. The results of this study could assist retailers in the selection of technologies considered useful to the employee as part of his or her job responsibilities, particularly customer interaction, and also those technologies that may incorporate enjoyment or fun into the work of employees.

## Background

### Customers and Employees

Danziger (2006) suggested that retailers create in-store excitement by involving customers with the store and its brands. This involvement required the development of "points of customer interaction with products," especially in active formats that allow for customer creativity and self-expression. She also noted that involvement can be augmented by having knowledgeable employees (Danziger, 2006). Rayport and Jaworski (2005) classifed the unique experiences between customers and companies as "service interfaces" and noted that successful delivery of experiences relied on working backwards through a chain of "interactions and relationships that shape those experiences to the configuration of the interfaces and interface systems that will successfully mediate those relationships" (p.5). For example, customers of a particular retailer might enjoy the personalized service provided by store employees such as calling the customer by name or remembering preferred styles or colors. To maintain this level of service the retailer may adopt

technologies that identify the customer when he or she enters the store or provide employees with data on past purchases made by the customer so employees can suggest new items.

While knowledgeable employees are valuable to the customer experience and thus to the retailer, the challenge lied in retaining this essential resource. Swinyard (1997) predicted a shortage of entry-level retail workers based on slowing population growth, which would also result in decreased retail profits. Employee turnover was also a factor for the retail industry (Samli,1998) as the U.S Department of Labor reported that its turnover rate of retail employees was 34.7% in 2006, the 3rd highest voluntary turnover rate after jobs in food services and hospitality (NOBSCOT, n.d.). Realizing that they would be affected by a shortage of retail executives in the near future, retailers like Macy's, JC Penney and Wal-Mart, initiated their own in-house employee development and training programs to cultivate and retain their workers (Reda, 2008). These in-house programs were different from the dwindling number of executive training programs that once aggressively recruited recent college graduates and dominated the apparel retail industry in the 1980s (Fostering Employee Development, 2008). Employee development involved education and experiences that prepared the employee for future job roles and involved learning that was not always related to the employee's current job (Noe, 2008). Developing existing employees was an aspect of retail that Samli (1998) argued would no longer be an option for retailers but rather a crucial part of their survival in keeping pace with the sophisticated products and systems brought about by technology.

The retail industry also suffered from its low-paying jobs that lack growth potential and discouraged current and potential employees from

considering it as a long-term career (Swinyard, Langrehr & Smith, 1991; Broadbridge, 2003). Research reported by Knight, Crustinger, and Kim (2006) revealed that apparel merchandising students already working in retail stores were more interested in other potential retail career areas such as product development and public relations than those in store management. In another study, retail store managers who were college graduates were found to be more dissatisfied than retail corporate office workers and indicated that they had less autonomy and less variety in their jobs and showed higher turnover intentions (Rhoads, Swinyard, Geurts & Price, 2002).

Retail employee dissatisfaction can also affect the service experience of customers. At Sears stores, high employee turnover was associated with lower service ratings of employees by customers, while low turnover was related to higher customer service ratings (Ulrich, Halbrook, Meder, Stuchlik & Thorpe, 1991). A recent survey of 1000 customers conducted by the Verde Group and Wharton's Baker Retail Initiative program revealed that customer dissatisfaction with store employees was a major contributor to lost sales (Knowledge@Wharton, 2007). Rayport and Jaworski (2005) linked the trend in what they called "stagnant customer satisfaction ratings" over the last decade to shortages of service personnel and a retail environment that was the equivalent of "sweatshops of a postindustrial society". They viewed this shortage as a technological opportunity for the use of computers to support and supplement work done by humans. In a study of technology use among sales personnel, Senecal, Pullins and Buehrer (2007) reported that an increase in technology use among sales personnel in areas such as financial services and automotive sales resulted in better customer service and job performance.

## Technology Functions in the Apparel Retail Environment

*Customers & Technology*. Studies have been conducted to evaluate consumer perceptions and intentions to use technology in stores. Burke (2002) found that interest in in-store technology among respondents included electronic shelf labels, electronic signs, kiosks and handheld scanners. In another study by Kamali and Loker (2002), a majority of participants involved in a mass customization process by using a web-based product configurator to design t-shirts were found to be interested in this customer design process and willing to purchase the t-shirt they had designed. Researchers also found positive customer interest in body scanning technology by people who had experienced the scanning process (Loker, Cowie, Ashdown & Lewis, 2004; Lewis & Loker, 2007). Lee, Kunz, Fiore and Campbell (2002) found that female respondents were more willing than males to use body scanning technology for design of customized apparel and that females also wanted to be able to see the customized product on an image of themselves in the store, to use the computer for surface design and to have assistance from a store employee with a specialized fashion design background. These desired in-store apparel design experiences extend beyond traditional retail shopping and suggest that today's apparel customers are ready for and indeed searching for more product variety, experiential shopping and participation in the design process.

*Employees and Technology.* Swinyard (1997) contended that in the increasingly competitive retail industry, technology use would determine retailer success and would require a technologically educated retail management workforce. The majority of apparel retail stores did not demand a high level of employee technological skill or initiative as most responsibilities

like merchandising, pricing or visual displays, were controlled and disseminated to the stores by corporate headquarters or regional offices for easy implementation (Rayport & Jaworski, 2005). This lack of technology use as part of work and limited opportunities for individual initiative in retail stores negatively influenced employee satisfaction and long-term retention. The Occupation Information Network (2009) listed the tools and technologies associated with work done by retail salespersons and included barcode scanners, calculators, computerized cash registers, credit card readers, and software to support accounting, human resource and point of sale functions. These technologies were capable of supporting service interactions with customers, for example the use of a barcode scanner to find out if more of an item was available in the store, but they were not able to support the more innovative design and mass customization activities in which customers would like to engage (Lee et al., 2002).

*Technology-Enabled Points of Customer Interaction.* The use of technology by people was the foundation of an area of study known as *Human-Computer Interaction*. Human-Computer Interaction considered the different types of technology users based on characteristics such as age, occupation and motivation and how to best configure technology that addresses these personal variations (Greenberg, 1997). The use of technology by retail employees as part of customer service could vary based on the nature of the service interaction (e.g. customer needs, employee motivation) and required diverse technology formats to support interaction. Froehle and Roth (2004) conceptualized how both employees and customers might interact with technology in service situations and described five different modes of interaction. The modes of customer contact were further organized

into “face-to-face” and “face-to-screen” contact. Face-to-face contact involved interpersonal contact between the customer and a service representative including:

- **technology-free** mode (no use of technology during service encounter)
- **technology-assisted** mode (technology aided the service representative to improve customer interaction – the POS system is classified here)
- **technology-facilitated** customer contact mode (service representative and customer both used technology to enhance the interaction).

In face-to-screen contact modes, technology was the only point of contact, including:

- **technology-mediated** mode (technology was used as the only means of interaction between customer and service representative)
- **technology-generated** customer contact mode (technology substituted for service representative)

Froehle (2006) investigated how service representatives influenced customer satisfaction in the technology-mediated mode by measuring consumer satisfaction after using technologies such as online chat and email to interact with employees. Results indicated that personal characteristics of the employee related to throroughness, knowledge and preparedness influenced customer satisfaction regardless of the type of technology used by the employee to support the service encounter. No evaluations of employees or their reactions to the use of technology were measured, but the results

suggested that the hybrid format of customer interactions, using the best of what people and technology had to offer, would provide a more positive customer experience. Similarly, Rayport and Jaworski (2005) described customer-employee interface archetypes as *people-dominant*, *machine-dominant*, *people-led hybrid* and *machine-led hybrid*. The people-dominant interface was similar to the technology-free mode (Froehle & Roth, 2004) since only person-to-person contact was part of the employee and customer interaction. The machine-dominant interface was like the technology-generated mode (Froehle & Roth, 2004) since the customer only interacted with technology. The two hybrid formats (people-led and machine-led) involved interaction with both an employee and technology but are distinguished by whether or not the employee or the technology (i.e. a computer) is in the forefront of the interaction. For example, check-in kiosks at airport ticket counters were machine-dominant hybrids since the passenger primarily interacted with the computer while airline agents helped verify identification or checked luggage.

Retail stores were making use of the hybrid interface but mainly in terms of technology-assisted, people-led modes such as Point-of-Sale systems (POS) and wireless devices, which did not necessarily engage or involve the customer. The hybrid interface of people and machines working together described by Rayport and Jaworski (2005), when combined with the face-to-face and face-to-screen modes described by Froehle and Roth (2004), provided organizational strategies to study.

**Theoretical Framework**

The three selected technologies in this study were new to the apparel retail industry and not yet widely used, so much of their intended value in the

store environment had not been evaluated. Even if a retail company determined that a technology would be valuable for its business, there was no guarantee that employees or customers would use it. Bickers (2008) reported that the eventual failure of the Smart Dressing Rooms at Prada was due in part to bad attitudes towards the technology by store employees, or “employee sabotage”. These dressing rooms were able to detect information contained on RFID tags and labels inside a garment when it was brought into the dressing room and then displayed images and product information related to the item on monitors. So, why would employees not support use of a technology that provided customers detailed and accurate information on a product?

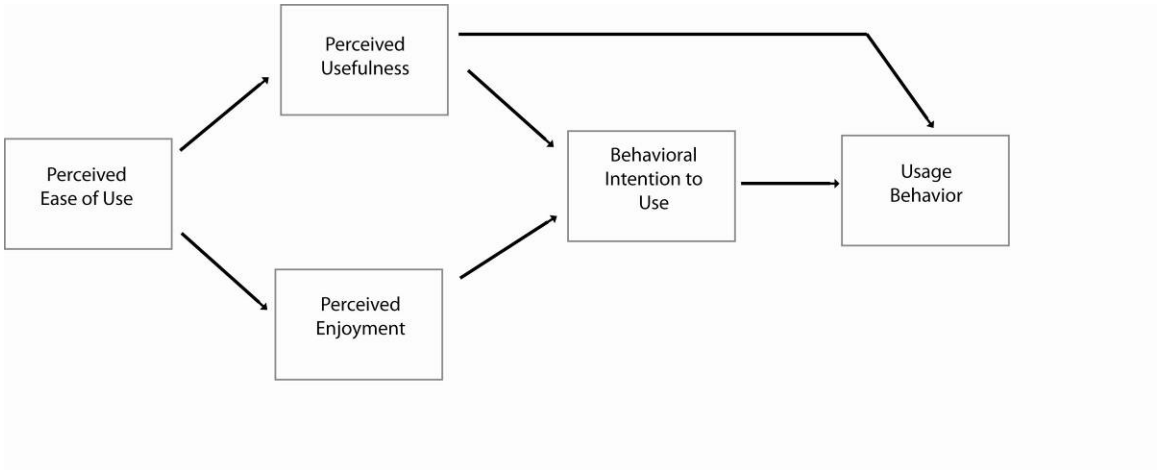


**Figure 4.1. Technology Acceptance Model (Davis, Bagozzi and Warshaw, 1992).**

Willingness to adopt new technologies was researched by Davis, Bagozzi and Warshaw (1989) applying the Technology Acceptance Model or TAM, which is based on the Theory of Reasoned Action, a theory of social psychology which measured the strength of one’s intentions upon actual behavior (Ajzen & Fishbein, 1980). Perceptions in terms of usefulness and ease of use were the two main premises of the TAM and were theorized to

influence attitude and behavior towards use of a new technology (Davis et al., 1989). Usefulness was defined as how much users believed that using a technology would improve job performance. Ease of use referred to how much users felt that using a technology would be free of effort (Davis,1989) and was influenced by the users' levels of technology self-efficacy, or how comfortable they felt using a computer or other technology (Davis, 1989; Venkatesh and Davis, 1996; Compeau and Higgins, 1995).

In later research using the TAM to study intrinsic and extrinsic motivations for computer usage among MBA students, Davis, Bagozzi and Warshaw (1992) found that usefulness and enjoyment were significant predictors of intention (see Figure 4.1). Perceived enjoyment was defined as the user's determination of how much fun will be derived from using the technology irrespective of its functionality or expected output. While usefulness and enjoyment combined were found to have a significant impact on users' intended use, usefulness was shown to influence intentions four to five times more than enjoyment (Davis et al., 1992). Davis et al. (1992) also evaluated task importance, or how important technology was to one's job, as a moderator of the influence of ease of use on usefulness. Usefulness and enjoyment combined were found to have a significant impact on users' intended use, though usefulness was shown to influence intentions four to five times more than enjoyment (Davis et al., 1992). Task importance was also found to significantly moderate the effect of ease of use on usefulness. These findings indicated that users would not necessarily adopt a new technology for work just because it was fun or novel, but there must also be a strong component of utility in terms of what the technology could do to support job tasks. Perhaps, Prada employees did not view smart dressing rooms as

valuable because the technology was viewed as complicated, not fun and/or not supporting their work.

The Technology Acceptance Model (TAM) was tested among salespeople to measure the factors influencing their adoption of technology used for daily activities (Robinson, Marshall & Stamps, 2005) and results supported the TAM; however, the technologies being evaluated here were distinct from those used in previous studies which used common software programs or technologies that people were already familiar with (email, instant messaging or electronic organizers). This study tested some of the core relationships of the Technology Acceptance Model with less familiar, innovative and advanced technologies in the retail context.

The three technologies selected for examination in this study represented the latest advances in technology that have been specifically adapted to the apparel retail environment as new concepts. They were not yet widely used and are not merely updates of conventional retail technologies. They also represented the three hybrid interface formats: technology-assisted, technology-facilitated and technology-mediated (Froehle & Roth, 2004) which involved both people and machines/technology working together. A discussion of these new technologies, their current use, and possible benefits as hybrid technology interfaces in apparel retail stores follows.

*Body Scanner.* The scanner provided useful information to retail employees about store products mostly likely to provide the best fit for the customer. In its “size selection” applications, the scanner compared the customer’s individual body measurements with the retailer’s clothing specification measurements in order to suggest sizes and styles to the customer that would provide the best fit. This was done by having the

customer enter an enclosed booth where white light, lasers or radio waves were used to establish the shape of the body by capturing thousands of data points. Software designed for use with the scanner translated the data points into body measurements important to good fit and then compared these measurements with those used by the retailer and advised which sizes and styles would best fit the customer. The scanning process was considered a *technology-assisted format* since only the employee operated or actively used the technology to support the task of finding the right size and style for the customer.

*Product Configurator.* The product configurator was an electronic tool where computer software enabled a user to customize apparel by style or color or any other design features the retailer chooses to offer and view the changes virtually. This technology had largely been used by small niche apparel businesses and by sportswear retailers like Nike, Reebok and Adidas for customized footwear. The configurators were usually web-based for use by on-line shoppers (technology-generated customer contact) but they were beginning to appear in stores as well, adding another potential point of contact for the customer. Nike was one of the first companies to offer an online customization tool for its footwear in 1999 called NIKEiD, and in 2007 they introduced the NIKEiD studio in the company's New York City store. Customers were now able to interact with employees known as design consultants who help them through the 45-minute customization process to create their own footwear or apparel (PR Newswire, 2007). The configurator provided an opportunity for both the employee and the customer to creatively interact around the product as a *technology facilitated service interface* (technology used by both the employee and the customer) and had the

potential for establishing new job roles for retail employees (similar to Nike's design consultants) and enhancing the desired in-store experiences of customers for customization and consultation.

*Social Networking.* Social networking was a web-based technology that allowed subscribers to communicate with others in their same geographic area, a specific group or network of acquaintances. It was the technology used for web-based services like Facebook, MySpace and Second Life. JC Penney launched its own online community for a new lingerie line in order to gather customer responses to the fit and quality of its new products, asking customers to create profiles, participate in discussion boards, and contribute to online chats with the JC Penney product team (Passenger, 2008). Social networking was also the conceptual foundation for a new in-store technology developed by digital agency Icon Nicholson, called Social Retailing that was tested and introduced in retail stores in 2007 and allowed customers to connect to a network of acquaintances via email or instant messaging in order to get real-time feedback from this network on styles that were at that moment being tried on in the store (IconNicholson,n.d.). Social networking is a *technology-mediated interface* which means technology is the only point of contact for employees and customers. This format may be yet another means of developing enhanced or new job roles for employees as design or product *moderators* as they gather information, as in the case of JC Penney, or as they observe customer comments around the product as with Social Retailing. Social Retailing also exemplified how customers were being introduced to more technology and how they might have desired more personalized products and/or interactions. An understanding of how employees responded to technologies like social networking or product configurators was essential

for successful future widespread implementation of advanced technologies. It would help in developing an engaged, technologically educated retail workforce (Swinyard, 1997) who were satisfied with their jobs and were able to meet customer satisfaction expectations as well.

This study was an extension of the Davis et al. (1992) test of the TAM model. Data were collected from a sample of apparel retail store employees who interacted with three advanced technologies in the context of the apparel retail industry. The intrinsic and extrinsic motivating factors that Davis et al. (1992) hypothesized as influencing behavioral intention to use technology were analyzed, specifically the influence of perceived usefulness (extrinsic) and perceived enjoyment (intrinsic). Other variables that could influence both extrinsic and intrinsic motivations to use technology in the store were examined, such as the employee's attitude towards helping customers (service orientation), technology self-efficacy, the type of technology and how it related to one's job (task importance) and current job position. Based on the research literature, service orientation, technology self-efficacy and task importance were added to the model for this study as interaction effects upon the core TAM variables of perceived ease of use, perceived usefulness, perceived enjoyment and behavioral intention as shown in Figure 4.2.

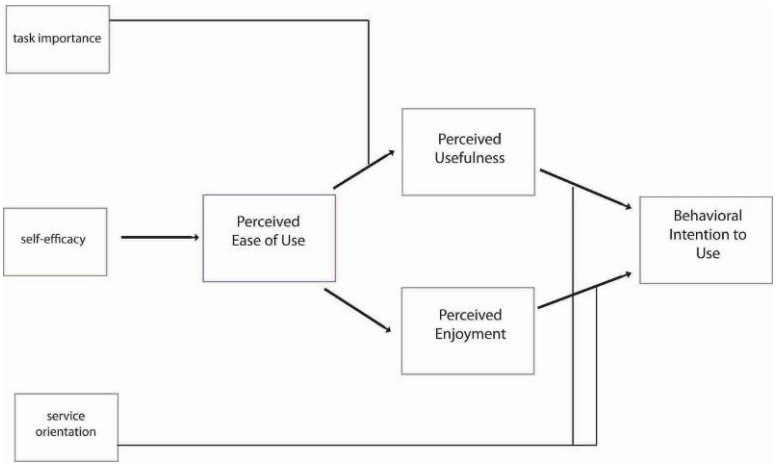


**Figure 4.2. Adapted Technology Acceptance Model showing interactions**

## Hypotheses and Research Questions

Based on the Technology Acceptance Model (TAM), the following relationships were hypothesized:

**H1**: Perceived usefulness and perceived enjoyment will have significant effects on employee behavioral intention to use technology.

**H2**: The effect of perceived ease of use on employee behavioral intention to use technology will be mediated by both perceived usefulness and perceived enjoyment.

**H3**: Task importance will moderate the effect of perceived ease of use on perceived usefulness but not on perceived enjoyment.

Placing this study in the context of actual retail workers meant that other occupation-related factors would influence how employees perceive technology and its value. Findings by Rhoads et al. (2002), showed that retail store workers were more dissatisfied than retail corporate workers, indicated that different factors influenced workers based on their position within a company. For example a sales manager may find a particular technology more useful than a sales associate if it provides her with more time to complete

administrative paperwork. Similarly, an employee may start out with an entry-level retail position but if he or she decided to make a career in retail, and was motivated to achieve a higher position, the employee may show greater inclination towards adopting new technologies as part of extrinsic motivation (e.g. a better job). Noe (1995) hypothesized that the closer an employee was to his or her career goal, the more likely he or she would be to engage in development activities. However study results did not support this hypothesis. Instead results indicated that employees further away from their career goals showed greater interest in and motivation toward development behaviors (Noe, 1995). Noe's original hypothesis and the contradictory findings prompted a research question rather than a directional hypothesis.

**R1:** Will current employee job level influence behavioral intention to use in-store technology?

Customer service was another important component of the retail store environment and studies demonstrated that both customers and employees were generally unhappy with it. If an employee already had an interest in helping customers or enjoyed the "people" factor of working in retail (service orientation), he or she would find technology useful for enhancing interactions or providing an enjoyable alternative format for building customer relationships. However, if an employee did not value customer interactions, technology was not likely to change this aspect of his or her personal behavior.

**H4**: Employee service orientation will moderate the effect of perceived usefulness and perceived enjoyment on behavioral intention to use in-store technology.

How confident employees felt towards using technology, or their self-efficacy, could influence how they perceived a technology's ease of use (Venkatesh and Davis, 1996) and could therefore influence how useful and/or enjoyable they perceived a technology. Employees would need to feel confident using a technology first in order to view it as easy to use, able to improve their job performance or even fun to use. If a new technology was adopted by a company and employees immediately perceived it as too cumbersome or complicated, the technology would be destined to fail as seen in the case of Prada's smart dressing rooms.

**H5**: Perceived ease of use will mediate the influence of *employee technology self-efficacy on perceived usefulness and perceived enjoyment.*

The type of technology that the employee interacted with could also influence his or her intention to use it. As hybrid interfaces, each technology represented a mix of human and computer contact but two of the technologies still involved face-to-face contact between the customer and employee (body scanner and product configurator) and could be preferred by employees who enjoy interacting with their customers.

**H6**: Apparel retail employees with high service orientation will show greater intent to use Technology Assisted Customer Contact (body scanner) and Technology Facilitated Customer Contact (product configurator) formats than intent to use Technology Mediated Customer Contact (social networking).

Both the product configurator and social networking are technologies that support new job roles for apparel retail employees (e.g. design consultants or moderators), while the body scanner supports a job role that

already exists in apparel retail stores – that of the *fit expert*. Employees receive the designation of *fit expert* once they have developed extensive knowledge about the store's product and can successfully determine which size and style will best fit the customer. The body scanner effectively supports this role and can even enhance the employee's knowledge. So, employees who indicated an interest in design-related or fit expert job roles would view these new technologies as part of their development.

**H7**: Apparel retail employees who indicate a higher interest in design roles will show greater intention to use the product configurator and social networking than employees not interested in design roles.

**H8**: Apparel retail employees who indicate a higher interest in fit expert roles will show greater intention to use the body scanner than employees not interested in fit expert roles.

## Method

### Instrument

Apparel retail store employees and former employees with work experience in an apparel store were recruited for the study in order to assume a base level of retail store experience. Participants completed the first section of a printed questionnaire about technology self-efficacy and service orientation and then were introduced to technologies as the study's treatments. Participants were shown how to use each technology by the researcher to ensure some level of knowledge among participants and they were then instructed to independently use each technology with short written directions as aids. They completed the questionnaire section specific to each technology after using it and then followed the same procedure with the second and third technologies.

The questionnaire included items and scales to measure 1) service orientation and technology self-efficacy (administered before the technology treatments), 2) the core TAM variables of perceptions of ease of use, usefulness, enjoyment and behavioral intention, and 3) career and demographic information. Service orientation items consisted of those taken from the five 5-point customer orientation items ($\alpha$ = .91) developed by Susskind, Kacmar and Borchgrevink (2003) to measure customer service attitude. The ten item 10-point computer self-efficacy measurement ($\alpha$ = .95) developed by Compeau and Higgins (1995) was used to measure employee technology self-efficacy. Variables related to the Technology Acceptance Model (Davis et al., 1992) were measured using six 7-point items for perceived usefulness ( $\alpha$ = .98) and six 7-point items for perceived ease of use ($\alpha$ = .94), both developed and validated by Davis (1989). From Davis et al. (1992), three 7-point items for perceived enjoyment ($\alpha$ = .81), one 7-point item for task importance and two 7-point items for behavioral intention ($\alpha$ = .88) were used.

Scales were modified to relate to specific technologies by adding the specific name of each technology. Open-ended questions were included at the end of section two and asked participants to indicate how using the technology would make their job better and also how using the technology would change the way they work with customers.

Current job position and highest desired future job position were measured with two separate items developed using job labels taken from the National Retail Federation's career ladder. Additionally, one 5-point item from the Focus scale of the Career Exploration Survey (Stumpf, Colarelli, & Hartman, 1993) was used to measure employee certainty of career goal. One 5-point item adapted from the Method Instrumentality scale of the Career

Exploration Survey (Stumpf et al.,1983) measured if use of each technology would aid the employee's career goal. Demographic information collected included participant job title, type of store, hours worked, gender, age, education and personal technology use.

**Data Collection**

Data were collected in a large mall in Central New York and a laboratory space near a university. Participants were recruited for the mall study from mall employees using flyers distributed by the main mall office and two incentives were offered: a raffle for one of three $50 gift cards and a $5 giftcard for a local restaurant for everyone who completed the study. For the laboratory study site, participants were recruited via university email listservs, in-class announcements, the research recruitment website of the university's psychology department, Craigslist and through visits to local retail stores. All prospective participants were offered a $20 incentive to complete the study to aid in recruitment.

Each site was set up with a body scanner and two laptop computers. The body scanner was operated by a desktop computer loaded with specific software for producing an image of the scanned person and extracting measurements. Participants were able to view a stored image of a body scan and its corresponding measurements. One laptop was used for the product configurator site and the other for social networking. Participants were able to select prints and style features for three garments (shirt, overalls and jacket) using the product configurator. The social networking site consisted of a customer message board and customer profiles for both men's and women's clothing that participants could navigate as if they would be contacting a customer regarding a store's products. Although these sites were web-based

and interactive, in this study the technologies were formatted so that participants did not need to connect to the Internet to limit technical problems.

## Results

### Sample

A total of 71 people completed the study between the two sites – 10 participants at the mall site and 61 at the laboratory site. The sample (see Table 4.1) included 56 females (78.1%) and 15 males (21.1%). Ages of participants ranged from 16 years to 66 years with 42 people ages 16 -21 (59.2%), 19 participants ages 22-29 (26.8%) and 10 participants over 30 years old (14.1%). Most of the participants had received some post-secondary education with 39 (54.4%) reporting some college education, 14 participants (19.7%) had a Bachelor's degree, 9 had an Associate's degree (12.7%), and 3 (4.2%) had some type of graduate degree.

**Table 4.1. Sample Description**

| | | | Store Type | | | | | Current Job | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Totals (%) | Child | Women's | Men's | All | Other | Not Working | Sales Associate | Manager |
| **Education** | High School | 6 (8.5) | - | 1 | - | 2 | 3 | 4 | 1 | 1 |
| | Some College | 39 (54.9) | 3 | 15 | 2 | 19 | - | 19 | 12 | 8 |
| | Associate's | 9 (12.7) | - | 6 | 2 | | 1 | 1 | 1 | 7 |
| | Bachelor's | 14 (19.7) | - | 10 | - | 3 | 1 | 6 | 2 | 6 |
| | Graduate | 3 (4.2) | - | - | - | 3 | - | - | 2 | 1 |
| **Age** | 16 - 21 | 42 (59.2) | 2 | 15 | 2 | 20 | 3 | 27 | 12 | 3 |
| | 22 - 29 | 19 (26.8) | 1 | 10 | 2 | 6 | - | 3 | 6 | 10 |
| | 30 + | 10 (14.1) | - | 7 | - | 1 | 2 | - | - | 10 |
| **Gender** | Female | 56 (78.9) | 3 | 31 | 1 | 16 | 5 | 22 | 14 | 20 |
| | Male | 15 (21.1) | - | 1 | 3 | 11 | - | 8 | 4 | 3 |

Note: *N*=71

There were 41 participants (57.8%) who were currently working in a retail store and 18 were employed as sales associates (25.4%) and 23 were managers (32.4%). There were 30 participants (42.3%) with retail work experience who were not currently working in retail. The most common product category that participants worked in was women's clothing with 32 (45.1%), followed by stores that sold men's, women's and children's clothing where 27 participants (38%) worked (see Table 4.1).

**Factor Analysis**

The technologies used in this study were quite distinct from those used in the Davis et al. (1992) study. To verify the internal consistency of the TAM variables for each technology, factor analysis with varimax rotation was conducted on the three variables of perceived ease of use, perceived usefulness and perceived enjoyment. The final reliability scores are presented for each technology in Table 4.2. All items loaded on the appropriate single factor except three items for the product configurator's perceived ease of use scale. These three items also appeared to load on a second factor resulting in lower variance explained by ease of use (17.7%) and more variance explained by enjoyment (23.7%) for the product configurator ($\alpha$ =.79) than factor loadings for the other two technologies (see Table 4.2). To be consistent with the Davis et al. (1992) research, all items were used in the data analysis as developed.

**Table 4.2. Factor Analysis results for the body scanner, product configurator and social networking**

| | | | Item Loadings | | | |
|---|---|---|---|---|---|---|
| Technology | Item | Cronbach's α | Factor 1 | Factor 2 | Factor 3 | Variance Explained |
| Body Scanner | | | | | | |
| | EOU1 | | .05 | **.89** | .00 | |
| | EOU2 | | .34 | **.80** | .10 | |
| | EOU3 | | .21 | **.76** | .34 | |
| | EOU4 | | .34 | **.63** | .41 | |
| | EOU5 | | .35 | **.74** | .10 | |
| *n=71* | EOU6 | .89 | .20 | **.85** | .10 | 26.9% |
| | USF1 | | **.80** | .25 | .09 | |
| | USF2 | | **.87** | .29 | .09 | |
| | USF3 | | **.90** | .20 | .09 | |
| | USF4 | | **.86** | .22 | .14 | |
| | USF5 | | **.87** | .22 | .15 | |
| *n=70* | USF6 | .94 | **.78** | .14 | .39 | 32.1% |
| | ENJ1 | | .18 | .13 | **.92** | |
| | ENJ2 | | .18 | .14 | **.87** | |
| *n=70* | ENJ3 | .85 | .08 | .13 | **.81** | 18.6% |
| Product Configurator | | | | | | |
| | EOU1 | | .09 | .03 | **.81** | |
| | EOU2 | | .39 | **.47** | .37 | |
| | EOU3 | | .17 | **.60** | **.59** | |
| | EOU4 | | .46 | **.56** | .24 | |
| *n=71* | EOU5 | | .11 | .30 | **.86** | |
| | EOU6 | .79 | .07 | -.07 | **.80** | 17.7% |
| | USF1 | | **.90** | .25 | .07 | |
| | USF2 | | **.91** | .22 | .07 | |
| | USF3 | | **.93** | .15 | .18 | |
| | USF4 | | **.92** | .16 | .17 | |
| | USF5 | | **.88** | .28 | .09 | |
| *n=68* | USF6 | .96 | **.74** | .30 | .02 | 35.2% |
| | ENJ1 | | .22 | **.89** | .04 | |
| | ENJ2 | | .18 | **.90** | .01 | |
| *n=67* | ENJ3 | .91 | .31 | **.80** | .05 | 23.7% |
| Social Networking | | | | | | |
| | EOU1 | | .06 | **.83** | .02 | |
| | EOU2 | | .09 | **.71** | .23 | |
| | EOU3 | | .12 | **.83** | .03 | |
| | EOU4 | | .38 | **.70** | .09 | |
| | EOU5 | | .15 | **.74** | .25 | |
| *n=68* | EOU6 | .87 | .16 | **.75** | .09 | 24.8% |
| | USF1 | | **.73** | .30 | .11 | |
| | USF2 | | **.85** | .19 | .13 | |
| | USF3 | | **.83** | .15 | -.03 | |
| | USF4 | | **.82** | .19 | .23 | |
| | USF5 | | **.88** | .04 | .21 | |
| *n=71* | USF6 | .93 | **.75** | .07 | .26 | 28.6% |
| | ENJ1 | | .27 | .19 | **.87** | |
| | ENJ2 | | .18 | .13 | **.92** | |
| *n=71* | ENJ3 | .90 | .14 | .16 | **.84** | 17.5% |

## Technology Acceptance Model

An evaluation of the mean scores on TAM variables for each of the technologies described how retail employees perceived them (see Figure 4.3). The variables were all measured on a 1 to 7 Likert-type scale with 1 = *Strongly Disagree* and 7 = *Strongly Agree*.

**Table 4.3. Service orientation, technology self-efficacy and TAM variable means by current job position**.

| Variable | | | | Current Job Position | | |
|---|---|---|---|---|---|---|
| | | *sample* | *N*[a] | *Not Working N = 30* | *Sales Associate N = 18* | *Manager N = 23* |
| | *Service Orientation* | 4.7 | 71 | 4.6 | 4.7 | 4.8 |
| | *Tech Self-Efficacy* | 72.6 | 70 | 68 | 74 | 77 |
| ***Technology Type*** | | | | | | |
| ***Body Scanner*** | EOU | 6.3 | 71 | 6.3 | 6.3 | 6.5 |
| | USF | 5.9 | 71 | 5.7 | 5.8 | 6.1 |
| | ENJ | 6.4 | 70 | 6.5 | 6.1 | 6.5 |
| | TASK | 6.2 | 66 | 5.6 | 6.5 | 6.8 |
| | BI | 6.2 | 71 | 6.0 | 5.9 | 6.5 |
| ***Product Configurator*** | EOU | 6.4 | 71 | 6.4 | 6.4 | 6.3 |
| | USF | 4.9 | 70 | 4.7 | 5.0 | 4.9 |
| | ENJ | 6.0 | 70 | 5.8 | 5.9 | 6.2 |
| | TASK | 4.6 | 64 | 4.4 | 4.5 | 5.0 |
| | BI | 5.1 | 71 | 5.0 | 5.1 | 5.2 |
| ***Social Network*** | EOU | 6.4 | 70 | 6.5 | 6.4 | 6.4 |
| | USF | 5.4 | 70 | 5.2 | 5.3 | 5.6 |
| | ENJ | 5.9 | 71 | 5.7 | 5.8 | 6.1 |
| | TASK | 6.1 | 68 | 5.8 | 6.4 | 6.3 |
| | BI | 5.5 | 71 | 5.0 | 5.7 | 5.9 |

Note: EOU (perceived ease of use), USF (perceived usefulness), ENJ (perceived enjoyment), TASK (task importance), BI (behavioral intention). [a]*N*s vary due to missing cases.

Means for all the TAM variables for each technology were high and above the neutral midpoint (=4) on the 1 to 7 scale. One-way ANOVA analysis showed that there were significant differences in the means across all technologies for each of the TAM variables, except perceived ease of use. Post-hoc analysis with Tukey's HSD was used to determine which technologies were significantly different for each variable (see Table 4.4). All

three technologies were highly rated for ease of use and no significant mean differences were detected (see Table 4.4). Significant mean differences were found for task importance between the product configurator (M = 4.58) and each of the other two technologies, which did not have significantly different means (the body scanner, *M* = 6.20; social networking, *M* = 6.10). Although the product configurator was not rated as highly for its importance to one's job, its mean was above a neutral rating of 4 on the 7-point scale suggesting that it may have some relevance for retail workers. Means for usefulness were lower for the body scanner and social networking than for the previous variables but were still positive and not significantly different from one another.

**Table 4.4. Mean Comparisons**

| Variable | F | Significance Level | Technology Type | N | Mean | Std Dev | Std Error |
|---|---|---|---|---|---|---|---|
| EASE | .322 | .725 | Body Scanner | 71 | 6.33 | .65 | .08 |
| | | | Product Config | 71 | 6.36 | .74 | .09 |
| | | | Social Netwk | 70 | 6.43 | .76 | .09 |
| USEFUL | 9.246 | .000* | Body Scanner | 71 | 5.86[a] | 1.21 | .14 |
| | | | Product Config | 70 | 4.86[b,c] | 1.67 | .20 |
| | | | Social Netwk | 70 | 5.39[a,c] | 1.20 | 14 |
| ENJOY | 5.979 | .003* | Body Scanner | 70 | 6.38[a] | .78 | .09 |
| | | | Product Config | 70 | 5.96[b] | 1.03 | .12 |
| | | | Social Netwk | 71 | 5.85[b] | 1.03 | .12 |
| TASK | 26.112 | .000* | Body Scanner | 66 | 6.20[a] | 1.26 | .16 |
| | | | Product Config | 64 | 4.58[b] | 1.96 | .25 |
| | | | Social Netwk | 68 | 6.10[a] | .92 | .11 |
| BHV INTENT | 11.089 | .000* | Body Scanner | 71 | 6.16[a] | .90 | .11 |
| | | | Product Config | 71 | 5.08[b] | 1.77 | .21 |
| | | | Social Netwk | 71 | 5.48[b] | 1.44 | .16 |

Note: Superscripts within each group represent pairwise comparisons. Means showing at least one letter in common are NOT significantly different at p<.05;* p<.05; all measured on a 1-7 Likert-type scale. *N*s vary due to missing cases.

The product configurator was also rated lower than the other two technologies on usefulness, but was still on the positive side of the scale. Enjoyment was significantly higher for the body scanner (M = 6.38) than for the other two technologies, but all were rated highly positive. The body

scanner also scored highest and significantly different on behavioral intention (M = 6.16), with the product configurator and social networking receiving lower positive ratings.

Hypotheses 1-4 were tested individually for each technology since participants completed separate questionnaires for each based on the TAM variables. Simultaneous multiple regression was used to test hypothesis 1 for all three technologies. Hierarchical multiple regression was used to test hypotheses 2 through 4 allowing the changes in $R^2$ for each block of variables to detect any increasing variability attributed to the addition of predictor variables. Hierarchical multiple regression was also used to detect mediating effects predicted in hypothesis 2. Independent variables were evaluated for multicollinearity to identify any possible correlations among the variables used in the multiple regression analysis. The collinearity statistics for the independent variables showed that multicollinearity did not present a problem for the data since results showed tolerances were above .40 and the variance inflation factors were low (less than 3).

***Body Scanner***. Hypothesis 1 was tested using simultaneous multiple regression to determine the effect of perceived usefulness and perceived enjoyment on behavioral intention to use the body scanner (see Table 4.5). The results indicate that both variables influenced behavioral intention with usefulness having a greater effect ($\beta$ = .61) than enjoyment ($\beta$ = .22), so hypothesis 1 was supported (see Table 4.5). Consistent with hypothesis 2, perceived usefulness and perceived enjoyment were found to mediate the influence of perceived ease of use on behavioral intention. Ease of use had a significant effect on behavioral intention when usefulness and enjoyment were not included in the model ($t_{68}$ = 2.90, $p<.05$); however, once usefulness and

enjoyment were entered into the model, ease of use was no longer significant ($t_{66}$ = -.88).

**Table 4.5. Simultaneous and Hierarchical Multiple Regression Results for Body Scanner**

| Body Scanner | Dependent Variable | $R^2$ | Independent Variable | $\beta$ | $SE_\beta$ | Significance Level |
|---|---|---|---|---|---|---|
| Hypothesis 1 | BI | .51 | USF | .61 | .02 | .00* |
| | | | ENJ | .22 | .07 | .02* |
| Hypothesis 2 | BI | .11 | EOU | .33 | .05 | .01* |
| | BI | .51 | USF | .61 | .02 | .00* |
| | | | ENJ | .22 | .07 | .02* |
| | BI | .52 | USF | .64 | .03 | .00* |
| | | | ENJ | .24 | .07 | .02* |
| | | | EOU | -.90 | .05 | .38 |
| Hypothesis 3 | USF | .31 | EOU | .39 | .21 | .00* |
| | | | TASK | .29 | .65 | .01* |
| | USF | .31 | EOU | .11 | .83 | .81 |
| | | | TASK | -.26 | 4.99 | .76 |
| | | | EOUxTASK | .69 | .14 | .52 |
| | ENJ | .15 | EOU | .35 | .08 | .01* |
| | | | TASK | .10 | .24 | .45 |
| | ENJ | .18 | EOU | -.33 | .30 | .50 |
| | | | TASK | -1.23 | 1.79 | .19 |
| | | | EOUxTASK | 1.69 | .50 | .16 |
| Hypothesis 4 | BI | .51 | USF | .61 | .02 | .00* |
| | | | ENJ | .22 | .07 | .02* |
| | BI | .52 | USF | .61 | .02 | .00* |
| | | | ENJ | .22 | .07 | .02* |
| | | | SO | -.08 | .07 | .34 |
| | BI | .54 | USF | 2.16 | .29 | .07 |
| | | | ENJ | -1.12 | .70 | .23 |
| | | | SO | -.46 | .67 | .57 |
| | | | USFXSO | -1.75 | .01 | .18 |
| | | | ENJXSO | 1.75 | .03 | .15 |

Note: BI (behavioral intention), USF (perceived usefulness), ENJ (perceived enjoyment), EOU (perceived ease of use), TASK (task importance), SO (service orientation); *p<.05

Usefulness then accounted for most of the effect on behavioral intention ($t_{66}$ = 6.32, p<.05, $\beta$ = .64). Enjoyment also showed a significant effect ($t_{66}$ = 2.50, p<.05, $\beta$ = .24) but not as large as usefulness.

Task importance was predicted to moderate the effect of perceived ease of use on perceived usefulness but not the effect of perceived ease of

use on enjoyment. The interaction between task importance and ease of use was not found to be significant for either perceived usefulness or perceived enjoyment so hypothesis 3 was partially supported. The interaction of service orientation on both perceived usefulness and perceived enjoyment was predicted to influence behavioral intention to use the body scanner. Neither interaction was found to be significant so hypothesis 4 was not supported.

***Product Configurator***. For the product configurator, perceived usefulness was found to have a significant effect on behavioral intention ($t_{66} = 7.60$, $p<.05$) but not enjoyment, so hypothesis 1 was partially supported (see Table 4.6). The effect of perceived ease of use ($t_{67} = 3.96$, $p<.05$) on behavioral intention was significant when usefulness and enjoyment were not accounted for in the model. However, when usefulness and enjoyment were added to the model, only usefulness was significant ($t_{65} = 6.67$, $p<.05$). Since the effect of perceived ease of use on behavioral intention was mediated only by perceived usefulness, and not perceived enjoyment, for the product configurator, hypothesis 2 was partially supported for this technology. The moderating effect of task importance with perceived ease of use was not found to have a significant effect on perceived usefulness or perceived enjoyment, so hypothesis 3 was partially supported for the product configurator. There were no significant moderating effects for service orientation with usefulness or enjoyment on behavioral intention, so hypotheses 4 was not supported.

**Table 4.6. Simultaneous and Hierarchical Multiple Regression Results for Product Configurator**

| Product Configurator | Dependent Variable | $R^2$ | Independent Variable | $\beta$ | $SE_\beta$ | Significance Level |
|---|---|---|---|---|---|---|
| Hypothesis 1 | BI | .53 | USF | .72 | .03 | .00* |
| | | | ENJ | .03 | .11 | .79 |
| Hypothesis 2 | BI | .19 | EOU | .44 | .13 | .00* |
| | BI | .53 | USF | .72 | .03 | .00* |
| | | | ENJ | .03 | .11 | .79 |
| | BI | .53 | USF | .72 | .04 | .00* |
| | | | ENJ | .02 | .12 | .82 |
| | | | EOU | .01 | .13 | .96 |
| Hypothesis 3 | USF | .53 | EOU | .44 | .30 | .00* |
| | | | TASK | .48 | .46 | .00* |
| | USF | .54 | EOU | .24 | .72 | .27 |
| | | | TASK | -.38 | 4.44 | .66 |
| | | | EOUxTASK | .94 | .12 | .32 |
| | ENJ | .29 | EOU | .44 | .12 | .00* |
| | | | TASK | .21 | .18 | .07 |
| | ENJ | .29 | EOU | .59 | .28 | .03* |
| | | | TASK | .86 | 1.73 | .43 |
| | | | EOUxTASK | -.71 | .05 | .55 |
| Hypothesis 4 | BI | .53 | USF | .72 | .03 | .00* |
| | | | ENJ | .03 | .11 | .79 |
| | BI | .55 | USF | .70 | .03 | .00* |
| | | | ENJ | .02 | .11 | .82 |
| | | | SO | .12 | .15 | .15 |
| | BI | .56 | USF | 2.62 | .60 | .13 |
| | | | ENJ | -.77 | 1.36 | .52 |
| | | | SO | .18 | .93 | .73 |
| | | | USFXSO | -2.03 | .03 | .26 |
| | | | ENJxSO | .92 | .06 | .50 |

Note: BI (behavioral intention), USF (perceived usefulness), ENJ (perceived enjoyment), EOU (perceived ease of use), TASK (task importance), SO (service orientation); *p<.05

***Social Networking***. For social networking, perceived usefulness ($t_{67}$ = 7.22, p <.05) but not perceived enjoyment, was found to have a significant effect on behavioral intention, and hypothesis 1 was partially supported (see Table 4.7). For hypothesis 2, perceived ease of use was not found to have an

effect on behavioral intention and when the variables of perceived usefulness and perceived enjoyment were added to the regression model, only usefulness emerged as having a significant effect on intent to use this technology ($t_{65}$ = 7.78, p<.05).

**Table 4.7. Simultaneous and Hierarchical Multiple Regression Results for Social Networking**

| Social Networking | Dependent Variable | $R^2$ | Independent Variable | β | $SE_\beta$ | Significance Level |
|---|---|---|---|---|---|---|
| Hypothesis 1 | BI | .50 | USF | .73 | .04 | .00* |
| | | | ENJ | -.045 | .09 | .65 |
| Hypothesis 2 | BI | .023 | EOU | .16 | .07 | .18 |
| | BI | .50 | USF | .73 | .04 | .00* |
| | | | ENJ | -.05 | .09 | .65 |
| | BI | .54 | USF | .74 | .04 | .00* |
| | | | ENJ | .03 | .09 | .74 |
| | | | EOU | -.08 | .05 | .40 |
| Hypothesis 3 | USF | .30 | EOU | .25 | .16 | .03* |
| | | | TASK | .45 | .78 | .00* |
| | USF | .30 | EOU | .81 | 1.59 | .46 |
| | | | TASK | 1.21 | 10.73 | .42 |
| | | | EOUxTASK | -1.03 | .27 | .61 |
| | ENJ | .14 | EOU | .22 | .07 | .06 |
| | | | TASK | .27 | .36 | .03* |
| | ENJ | .14 | EOU | .57 | .75 | .64 |
| | | | TASK | .74 | 5.04 | .65 |
| | | | EOUxTASK | -.63 | .13 | .77 |
| Hypothesis 4 | BI | .50 | USF | .73 | .04 | .00* |
| | | | ENJ | -.05 | .09 | .65 |
| | BI | .51 | USF | .71 | .04 | .00* |
| | | | ENJ | -.05 | .09 | .65 |
| | | | SO | .11 | .11 | .24 |
| | BI | .54 | USF | .21 | .51 | .88 |
| | | | ENJ | 2.18 | 1.19 | .12 |
| | | | SO | 1.04 | .72 | .08 |
| | | | USFXSO | .60 | .02 | .71 |
| | | | ENJxSO | -2.64 | .05 | .12 |

Note: BI (behavioral intention), USF (perceived usefulness), ENJ (perceived enjoyment), EOU (perceived ease of use); p<.05

Hypothesis 2 was not supported since ease of use was not mediated by either usefulness or enjoyment. No significant interaction effects were found for ease of use with task importance on usefulness or on enjoyment. Ease of use did not significantly effect enjoyment, rather task importance showed a significant effect, so hypothesis 3 was not supported. Moderating effects of service orientation with usefulness and enjoyment on behavioral intention were not significant so hypothesis 4 was not supported.

**Influence of Job Position**

One-way ANOVA was used to determine if there were differences among participants' intent to use each technology based on both their current job and highest desired future job position. For current job position, participants were compared based on three categories so that store managers were in one category called *management* (n=23) and could be compared to the *not working* (n=30) and *sales associate* (n=18) groups. The ANOVA showed that the mean differences between management and non-management participants was only significant for social networking, $F(2,68)=4.10$, $p<.05$. Post hoc analysis with Tukey's HSD showed the difference was between managers ($M$=5.9, $SD$ = 1.0) and those not working ($M$=4.9, $SD$ = 1.6).

Future job positions included *sales associate* (n = 30), *store manager* (n=28) and *district manager* (n=12). Fewer participants selected job roles outside of the retail store, so *district manager* included all job positions from Assistant District Manager to Regional Vice President representing management roles above store-level positions. ANOVA results showed a significant difference for intent to use social networking only $F(2,67)=4.87$, $p<.05$. Post hoc analysis with Tukey's HSD showed that employees who

selected future job positions at the district manager level had significantly higher behavioral intention to use social networking (*M*=6.5, *SD*=.98) than sales associates (*M*=5.2, *SD*=1.4) or store managers (*M* =5.3, *SD*=1.2)

A new variable called *delta job* was created to represent the distance in the number of job positions between the current and future job levels. The separate measures for employees' current job and highest desired future job were used to create the new variable by using the difference in the number of positions between one's current job and the desired future job. Current and future job choices included seven positions ranging from *Sales Associate* to *Regional Vice President,* so possible delta jobs scores could range from *0* to *6*, where *0* indicated no desired job change beyond one's current position. For this sample (*N* = 70, *range* = 2), most participants wanted to remain in their current job (n=24, 33.8%) or advance one position (n=29, 40.8%), and fewer participants (n=17, 23.9%) wanted to advance two or more positions. The ANOVA results did not show any significant mean differences for intent to use the technologies based on the distance between the employees current job and desired future job role.

Pairwise comparisons using the t-test were also conducted to examine possible differences in ratings of the TAM variables between participants who were working and those who were not currently working in a clothing store. Working retail employees showed significantly higher means, $t_{64}$=-3.27, p<.05, for task importance of the body scanner (*M* = 6.65, *SD* = .59) than those not working (*M* = 5.62, *SD* = 1.61). For social networking, working participants also had significantly higher means,$t_{69}$=-2.63, p<.05, for behavioral intent (*M* = 5.84, *SD* = .96) and task importance $t_{66}$=-2.35, p<.05, (*M* = 6.33, *SD* =.70) than participants who were not currently working, *M* = 4.98 (behavioral intent)

and *M* = 5.79, (task importance). All other variables were not significant.

Hypothesis 7 and 8 involved participants' interest in the new job roles of design consultant and fit expert and how this might influence intent to use product configurator and body scanner, respectively. Interest in the new job roles was measured using a 1 to 5 scale where 1= *Not Interested* and 5 = *Very Interested*. There was a positive interest in both job roles but there was greater interest in the role of design consultant (*M* = 3.4, *SD* = 1.4) than for the role of fit expert (*M* = 3.2, *SD* = 1.4). The regression results for interest in the design consultant role for intent to use each technology were significant only for the product configurator, $t_{68}$= 2.1, p<.05, $\beta$ = .25, and not for social networking so hypothesis 7 was partially accepted. The regression analysis for interest in the fit expert role did not reveal any significant results for intent to use the body scanner, therefore hypothesis 8 was not supported.

**Service Orientation**

To test the influence of service orientation on intent to use each technology, regression analysis was conducted. Service orientation was measured with five 5-point items with 1 = *Strongly Disagree* and 5 = *Strongly Agree*. The mean service orientation for the sample was *M* =4.7 (*SD* = 0.4). Significant results for the influence of service orientation on behavioral intention were only found for social networking ($t_{69}$=2.4, p<.05, $\beta$ = .28) and not for the body scanner or product configurator. Service orientation was hypothesized to influence behavioral intention for technology-assisted customer contact (body scanner) and technology-facilitated customer contact (product configurator) more than for technology-mediated contact (social networking). Hypothesis 6 was not supported since service orientation did not influence intent to use either the body scanner or product configurator.

## Technology Self-Efficacy

The Technology Self-Efficacy scale was used to measure participants' confidence in using new technology. The scale consisted of ten 10-point items where 1 = *Not At All Confident* and 10 = *Totally Confident*. Participant scores for each item were summed to achieve one self-efficacy score using Compeau and Higgins (1995) recommended procedure for capturing the strength and magnitude of the score (out of 100). The mean technology self-efficacy score for the sample was *M* = 72.6 (*SD* = 15.3). Hierarchical multiple regression analysis was conducted for each technology to test the influence of technology self-efficacy on perceived ease of use and the mediating effect of technlogy self-efficacay through perceived ease of use on perceived usefulness and perceived enjoyment. Results showed that self-efficacy directly influenced ease of use for the body scanner and product configurator, but not for social networking. Technology self-efficacy influenced usefulness for all three technologies. The influence of technology self-efficacy on perceived enjoyment was found for the product configurator and social networking but not for the body scanner (see Table 4.8).

**Table 4.8. Hierarchical Multiple Regression results for influence of Technology Self-Efficacy**

| Dependent Variable | $R^2$ | Independent Variable | Technology | β | $SE_B$ | Significance Level |
|---|---|---|---|---|---|---|
| **EOU** | .09 | TECH SEFF | ***Body Scanner*** | .31 | .03 | .00* |
| **USF** | .21 | TECH SEFF | | .46 | .05 | .00* |
| | .35 | EOU | | .40 | .19 | .00* |
| | | TECH SEFF | | .33 | .05 | .00* |
| **ENJ** | .04 | TECH SEFF | | .20 | .02 | .10 |
| | .16 | EOU | | .36 | .07 | .00* |
| | | TECH SEFF | | .08 | .02 | .49 |
| **EOU** | .11 | TECH SEFF | ***Product Configurator*** | .32 | .02 | .01* |

**Table 4.8 (Continued)**

| | | | | | | |
|---|---|---|---|---|---|---|
| **USF** | .15 | TECH SEFF | | .38 | .07 | .00* |
| | .36 | EOU | | .49 | .35 | .00* |
| | | TECH SEFF | | .22 | .07 | .04* |
| **ENJ** | .06 | TECH SEFF | | .24 | .02 | .05* |
| | .26 | EOU | | .47 | .12 | .00* |
| | | TECH SEFF | | .09 | .02 | .41 |
| **EOU** | .01 | TECH SEFF | **Social Networking** | .10 | .04 | .42 |
| **USF** | .13 | TECH SEFF | | .36 | .05 | .00* |
| | .21 | EOU | | .27 | .16 | .02* |
| | | TECH SEFF | | .34 | .05 | .00* |
| **ENJ** | .17 | TECH SEFF | | .41 | .02 | .00* |
| | .21 | EOU | | .21 | .07 | .06 |
| | | TECH SEFF | | .39 | .02 | .00* |

Note: technology self-efficacy (TECH SEFF), perceived ease of use (EOU), perceived usefulness (USF) and perceived enjoyment (ENJ). Note. *p<.05.

Ease of use did not mediate the effect of technology self-efficacy on usefulness for any of the technologies. When ease of use was entered into the model, technology self-efficacy still showed a significant influence on usefulness (see Table 4.8). Ease of use did mediate the effect of technology self-efficacy on enjoyment for the product configurator but not for the body scanner or social networking. Technology self-efficacy did not influence enjoyment for the body scanner, so ease of use had a direct influence on enjoyment instead of acting as a mediator. For social networking, technology self-efficacy did not influence ease of use and ease of use did not influence enjoyment, rather technology self-efficacy had a direct influence on enjoyment. Hypothesis 5 was partially supported since ease of use mediated the influence of technology self-efficacy on enjoyment for the product configurator (see Table 4.8).

**Linear Mixed Model**

The Mixed procedure in SPSS was used to further examine the influence of the TAM variables on behavioral intention. This post-hoc analysis resulted in a mixed model that was able to accommodate both the fixed effects (within subjects) of the variables measured for each technology and the random effects (between subjects) of subject-to-subject variance. The benefit of the model was that it provided a larger overall profile of the dataset without having to run various analyses. Variables entered into the model included: technology type, perceived ease of use, perceived usefulness, perceived enjoyment, service orientation, and task importance.

For comparison with the multiple regression results conducted for each technology, interactions were also entered into the model to account for the possible effect of technology type with each of the following variables and interactions: *perceived ease of use, perceived usefulness, perceived enjoyment, service orientation, task importance, perceived ease of use x task importance, enjoyment x task importance, perceived usefulness x task importance, perceived usefulness x service orientation, perceived enjoyment x service orientation*, and perceived *ease of use x service orientation*. Non significant variables and interactions were removed from the model in a stepwise manner beginning with non-significant higher order interactions (i.e. technology type x perceived usefulness x service orientation) and the analysis repeated with the remaining significant variables until the model contained only significant predictors.

The results of the final model showed four significant predictors for main effects: technology type $F(2,137) = 4.66$, $p<.05$, perceived usefulness $F(1,154) =11.92$, $p<.05$, perceived enjoyment $F(1,156) =12.09$,$p<.05$, task

importance F(1, 155)=4.51,p<.05. The significant interaction effects were: technology type x perceived usefulness F(2,152) = 5.08,p<.05, technology type x perceived ease of use F(2,149) = 4.11, p<.05, technology type x perceived enjoyment x task importance F(3, 151)=6.33, p<.05, technology type x perceived usefulness x task importance F(3,154) = 7.77, p<.05 and technology type x perceived ease of use x service orientation F(3,129)=3.93,p<.05. The final model explained 61% of the within-subject variance ($\beta$ = .61, $SE_\beta$ =.09) and 12% of the between subject variance ($\beta$ = .12, $SE_\beta$ =.08) for influence on behavioral intention.

## Discussion & Limitations

The results indicated that the core variables of the TAM model were supported for the body scanner where the variables predicted to influence behavioral intent to use technology were significant. Both perceived enjoyment and perceived usefulness influenced behavioral intent to use the body scanner and also mediated the effect of perceived ease of use. For the product configurator and social networking, only perceived usefulness influenced intent to use these technologies and the effect of perceived ease of use was not mediated by usefulness for social networking as hypothesized for the TAM (Davis et al., 1992). This result suggested that social networking might be adopted by employees based solely on this technology's ability to improve one's job performance whether or not this technology would be easy to use.

*Behavioral Intention*. Intent to use all three technologies was significantly influenced by usefulness but not by enjoyment. The difference in enjoyment's influence among the body scanner and the other two technologies may have emerged since the body scanner was not widely available for use whereas the product configurator and social networking

existed in varying formats and were easily accessible for public use via the internet through applications like NIKEiD (www.nikeid.nike.com) or Facebook (www.facebook.com). Participants may have felt more comfortable using these computer-based technologies since they were more familiar. The appearance of the scanner was also different from the other technologies and it may have intrigued participants due to its unusual and technical physical shape and features (booth, white lights, computer stand) as a fun device to use. Participants were also able to view the computer-generated output of a body scan and measurements during the demonstration of the technology while there were no such computer-generated image outputs for the other two technologies. The novelty of the scanner in terms of its image output and perhaps even its physical appearance as a booth or separate structure, may have influenced the perception of this technology as being not only useful but also “fun to use” (perceived enjoyment), while using the other (and perhaps more familiar) technologies on laptop computers may not have evoked any feeling of enjoyment since these computers and software applications were similar to those that people already use for completing work that was not associated with *fun*. Future research using these and similar advanced technologies could present each technology station physically unique by using kiosks instead of tables for displaying computers. Future technology studies might also test for the effect of hardware design on enjoyment to determine if users rated a technology different based on the type of computer or the aesthetic design of the technology. For example, if users are accustomed to using Apple’s Macintosh computer they may perceive software on this type of computer as more enjoyable than software used on a different brand of computer. Allowing for final views of technology output resulting from users

own creativity or choices might also influence ratings for enjoyment if users were able to see the result of their task, so future studies using technologies and/or software that permit more user input and interactivity may also result in different findings for the influence of enjoyment

Perceived enjoyment measured how fun a user thinks a technology will be regardless of how it supports work, so participants may have considered their personal interest in accessing the technologies. For example, they could use the scanner at work to find out what their own measurements or size would be. This type of personal information was not available with the other technologies. Making the other technologies more interactive and personal by connecting them to the Internet or perhaps assigning participants their own profile, may have allowed employees to imagine using technology for their personal enjoyment, which may contribute to overall perceptions of enjoyment. Also, the product configurator featured examples of children's clothing rather than adult clothing for customization. This may have influenced how participants rated enjoyment of this technology since they may not have been able to imagine using the technology for the type of store they worked in. Including a variety of product images for different age groups might have provided different results.

*Job Position*. The only significant difference in mean behavioral intention scores based on current job position was for social networking between participants who were not currently working in a store and store managers who were working. The value of social networking may be in its ability to facilitate communication with a large number of customers (sale notifications, follow-up inquiries, etc.). Managers may bear the responsibility of organizing and executing this communication so they may possess a greater

understanding of how this technology may apply to their job and prove a useful tool, but not necessarily a *fun* tool, than someone who is not currently working in a retail environment. The lack of a significant difference for behavioral intention between managers and sales associates may indicate that people working in retail stores view social networking as an appropriate tool for customer contact in general. Those not currently working in retail may not make this connection since social networking is a new technology more familiar to them for personal use and connections. Similarly, participants with an interest in future job positions above store level also showed greater intent to use social networking than either sales associates or store managers. This finding may also relate the level of communication required for these positions since district or regional managers would be responsible for not only communicating with customers but also to several different store managers in their area and social networking may be viewed as an effective tool for working in this manner.

*Task Importance*. Task importance did not moderate the effect of ease of use on usefulness for any of the technologies but it did show a significant main effect on enjoyment for social networking. This was an unexpected finding since enjoyment refers to how much fun a person would have using a technology irrespective of its impact on work. In the study conducted by Davis et al. (1992), task importance was hypothesized to not have a moderating effect or main effect on enjoyment and the results supported this. However, for this study the wording of the task importance question was altered in order to describe the tasks of an apparel retail employee that were relevant to each of the different technologies and perhaps the wording chosen for social networking influenced responses. Social networking was described as a

technology that would help employees contact customers for feedback and participants rated how important the task of contacting customers was to their job. This finding may also suggest that there is a different connection between enjoyment and job tasks that require further study – perhaps if an employee enjoys a particular job task this may also influence enjoyment of using a technology for completing that task.

*Service Orientation.* There were no moderating effects from service orientation with usefulness or enjoyment on intent to use the three technologies. However service orientation was found to directly influence behavioral intent to use social networking. Although use of this technology does not involve face-to-face contact with customers, participants may have a greater intent to use it for that very reason if they are very conscious of providing good customer service. Social networking may have been viewed as a way to continually respond to customer needs especially when the customers are not inside the store.

It is also worth noting that the service orientation scores for the sample were high overall indicating that most participants thought customer service was important and were willing to put forth the effort required to satisfy customer needs. Differences in the influence of service orientation may have been difficult to detect due to the high scores of the entire sample and a future study involving a sample with more variability in service orientation scores may show significant differences for behavioral intent. There may have also been a self-reporting effect where participants rated their service orientation higher than it actually was on the questions used for this study. Perhaps more rigorous measurement scales that used service scenarios and asked for employee reactions, or other evaluations of an employee's service orientation

(e.g. customer ratings) would have yielded more variation in the scores. Future studies might replicate the actual service encounter and evaluate the interaction of both apparel retail employees and customers using the technologies in the context of a retail store in order to better compare the effect of service orientation with technology use. For example, a service orientation measure could be compared with employee ratings of customer service after using a specific technology with an actual customer.

*New Job Roles*. Higher interest in becoming a design consultant was also related to greater intent to use the product configurator, but not social networking. The product configurator is uniquely related to design work since it allows employees and customers to freely select styles and prints based on personal preference or creativity. Social networking provides information regarding customer preferences and is also a means of asking for customer feedback, and for this study the technology interface did not allow users to select any garments for customers or assemble any outfits that they would recommend to a customer. It only allowed them to view images already placed on the website. Participants who considered themselves creative or enjoy creativity in their work may have indicated a greater intent to use the product configurator and showed interest in a job role that used one's creativity. Adjusting the social networking treatment to include more function on the site allowing for more user manipulation or choices may provide different results for the influence of the design consultant job role and intention to use this technology. The items that asked participants to indicate interest in the new job role also provided a brief description of the job. For design consultant it read "helps a customer design clothing" and for fit expert it read "helps a customer find the best fitting clothing by taking measurements". Some apparel

stores already have existing job roles for fit experts in specific clothing categories (denim, bras, etc.) so employees may have performed some tasks related to this job, like taking customer measurements, and did not see it as interesting as becoming a design consultant. Modifying the social network treatment site to include more functions, both for employee-employee interaction and employee-customer interaction, could change the results.

*Technology Self-Efficacy.* Technology Self-Efficacy directly influenced many of the TAM variables even when ease of use was included in the multiple regression model. The significance of technology self-efficacy when ease of use was added to the multiple regression model suggested that it might be more than an antecedent of ease of use. Ease of use referred to how users felt that a technology would be free of effort when used and technology self-efficacy measured the degree of confidence users would have with a new technology. Unique features and skills required for different technologies, such as similarity to personal technologies (social networking) or level of involvement required for use, could have determined the influence of technology self-efficacy. Participants may have found a technology easy to use but the context or purpose for which the technology is used might have influenced how confident they felt using it. For example, employees might find social networking software easy to navigate from screen to screen the same employees may not feel confident using the technology when contacting customers.

For this study technology self-efficacy did not influence ease of use for social networking or enjoyment for the body scanner. For the product configurator, however, significant results for the influence of technology self-efficacy on ease of use and enjoyment were found as well as the mediating

effect of ease of use on enjoyment. Since the social networking site was specifically designed for this study and did not allow for the Internet connectivity usually associated with social networking sites, participants as a whole may have not thought this technology was difficult to use and technology self-efficacy was not a major factor. Social networking technology was already available for personal use and more of the participants may have already been comfortable and confident using a similar interface. In terms of the body scanner, the procedure for using this technology was not as long and as involved with a computer as the other two technologies – participants only had to click an icon on the screen to initiate the scan process, while for the other technologies they were required to examine the software and make more than one selection. The simplicity of the scanning process may have not required much computer experience so technology self-efficacy would have little influence on enjoyment. Technology self-efficacy did appear to be an antecedent for perceived ease of use for the body scanner and product configurator and perceptions of these technologies as easy to use were likely influenced by technology-self-efficacy. However, enjoyment may have been influenced by technology self-efficacy for the product configurator since enjoyment of using this technology relied more heavily on how confident one felt using a computer to select a garment and choose different color and print options as opposed to selecting one icon to begin (as with the body scanner). Technology self-efficacy did directly influence usefulness for all three technologies with no mediating effect through ease of use. Usefulness is related to how one believes a technology with improve job performance. If users are not confident about using new technology it may be difficult to perceive the technology as helping to improve their work and may actually

negatively impact job performance. Likewise, if users are confident in their skills using new technology, they may perceive the benefits of the technology to job performance much more easily than users with low technology self-efficacy.

*Post Hoc Analysis of Model*. The Linear Mixed Model results matched many of the significant findings of the multiple regression and ANOVA analyses and provided information on different interactions that were not accounted for in the hypotheses. Perceived usefulness, perceived enjoyment and task importance as influences on behavioral intention were all significant main effects found in the multiple regressions for the different technologies. Perceived ease of use was not significant in the model as a main effect on behavioral intention likely due to the presence of usefulness and enjoyment in the model, which served as mediators for ease of use. The difference in behavioral intention based on technology type was found in the mean comparisons for each technology with the body scanner having a significantly higher mean for behavioral intention. The significant interaction of technology type with perceived usefulness was found with perceived usefulness as the only significant influence on behavioral intention for the product configurator and social networking. Likewise the interaction of technology type and perceived ease of use was found with perceived ease of use as a significant influence on behavioral intention for the body scanner and product configurator but not for social networking. The remaining significant interactions found in the linear mixed model were not tested in the hypotheses for this study but their significance suggested another possible evaluation of moderating relationships among variables hypothesized in this study to influence behavioral intention. Task importance appeared to moderate the

effect of usefulness on behavioral intention in the linear mixed model. In this study task importance was tested as a moderator with the effect of ease of use on usefulness and enjoyment. Also service orientation appeared to moderate the effect of ease of use on behavioral intention in the linear mixed model, but was tested in this study as a moderator with usefulness and enjoyment.

The linear mixed model provided another way of looking at the data and suggested additional interesting findings not included in the adapted TAM model that could be tested with several other emerging technologies across hybrid typologies. For example, retailers may decide to explore new ways to provide customer service through virtual communication with customers, and evaluate employee service orientation along with the usefulness, ease of use and enjoyment associated with using technology-mediated formats like the virtual community Second Life or real-time online chat sessions. These technologies may then also be evaluated inside the retail store as technology-facilitated formats where employees and customers can interact face-to-face while using them and additional measures for service orientation could be evaluated. Testing the technologies in this manner may help determine if the TAM is applicable to technology adoption in any situation or if adaptations are necessary to accommodate different types of technologies and human-comuter interaction contexts

*Human-Computer Interaction Implications***.** Additional implications can be drawn from comparisons across the employee-customer interaction technology formats: technology-assisted, technology-facilitated and technology-mediated. The body scanner is a technology-assisted format, which includes technology only used by the employee to help the customer. The significance of the TAM variables for this technology may suggest that

employees value technology that helps them in their work and that new technologies that are relevant, easy to use and enjoyable would likely be adopted by them. The product configurator is a technology-facilitated technology, which allows both the customer and the employee to use technology together, and neither enjoyment nor service orientation had significant effects in determining intent. This may be due to the absence of customer interaction available in the study when using each of the technologies and may have prevented participants from imagining a positive encounter with a customer or even how they might respond to a customer during this type of interaction. Similarly, in social networking, which is the technology-mediated form in which all employee-customer interaction is via computer, there was not an actual customer on the other end of this technology. Participants may not have been able to envision an enjoyable interaction or what type of service they could provide.

*Limitations.* Some of the limitations of this study included the experimental setting, software design, store types, work experience, and age and gender of the sample. The experimental setting of this study helped to control extraneous effects but it also may have detracted from the reality of a retail store setting where these technologies would actually be used with real customers. The relationships hypothesized based on the Technology Acceptance Model were not found for all of the technologies included in this study which may suggest that either the model or the context of the technology treatments is invalid. It will be valuable to conduct future studies evaluating the interaction of employees and customers with these and other complex technologies in an actual store environment and compared to the relationships theorized in the TAM model to examine if a more realistic employee/customer

context supports the model or would require adaptations.

Another limitation was the use of an existing research website for the product configurator. This website was designed to test the appeal of customizing children's clothing so all of the style images and prints were in the context of childrenswear. The questionnaire items for this technology could have asked participants to imagine its use for all product categories instead of allowing them to assume that its only application was for childrenswear. Future research should also include a variety of product categories and age-based designs to appeal to participants with experience working in several different apparel product categories. Also store types consisting of one product category, or *Specialty* stores, for this study were mostly women's specialty stores, so the generalization of results for other categories of specialty apparel stores (men's or children's) was not possible.

The age of this sample was fairly young with only 10 participants over the age of 30; however apparel retail industry statistics show that 31% of apparel retail workers are under the age of 24, which is more than twice the average percentage for other industries (Bureau of Labor Statistics, 2009a). The proportion of employees under the age of 24 in this study (73.2%, n=53) was much greater than that found in the population so results may not have accurately reflected attitudes of retail employees older than 24. The sample was mainly female (78.9%) with only 15 males (21.1%) participating in the study, but this difference closely compared to percentages of men and women employed in the US apparel retail industry, where females were 74.9% of the workforce (Bureau of Labor Statistics, 2009b). This study did not take into account the previous years of apparel retail work experience for participants, which could also influence employees' perspectives and

knowledge regarding the apparel retail industry overall as well as awareness of procedures and processes where technology might change how one works.

**Implications for Retailers**

The retail industry provides employment for a significant proportion of the US population with about 16 million jobs across different sectors from automobiles to furniture. Almost 1 million of those jobs are in the apparel retail industry making it the fourth largest employer (Bureau of Labor Statistics, 2009a). This study provided insight into how employees in this industry could use emerging technologies as tools for improving customer service and job satisfaction, two problems that affect retailers. Technology use has been linked to improved customer service (Seneca et al., 2007) which has also been tied to lower employee turnover (Ulrich et al., 1991). The findings of this study showed that employees overall had positive intentions toward using three advanced technologies with retail applications and rated them highly positive in terms of usefulness. The enjoyment of using a particular technology like the body scanner may increase an employee's job satisfaction and for apparel retailers this may also translate into reduced employee turnover rates. While service orientation did not moderate any effects of enjoyment or usefulness, the participants in this study indicated high levels of service orientation overall and the usefulness and intention ratings may indicate to retailers that their best employees want to use these technologies and see them as a valuable part of work. Customers have already indicated interest in using some of these technologies (Lee et al.,2002; Loker et al.,2004; Lewis & Loker, 2007), so if employees are also showing an interest in them it may be worthwhile for apparel retailers to evaluate the potential benefits of introducing body scanners and product configurators in stores.

However, this study also highlights the necessity of measuring employee intent to use a new technology before placing it in the store in order to maximize its successful implementation and to avoid such challenges as employee sabotage after its introduction as was the case with Prada's employee sabotage of smart dressing rooms (Bickers, 2008). Measures of usefulness may prove most valuable to retailers as they evaluate specific technologies for customer service. The usefulness variable emerged as a major influence on behavioral intent for all technologies and has also been identified as a positive influence on actual usage of technology once it's introduced to the user (Davis et al., 1992). The unexpected influence of task importance on enjoyment may also warrant further study as new technologies are introduced into apparel retail store to support existing job tasks – technology might be more appealing to retail employees if it supports a task they already enjoy doing instead of a task they dislike.

Apparel retailers that would like to incorporate technology into their stores might consider some of the following factors found in this study. First, employees rated all technologies as useful and this factor influenced intent to use these new technologies. This result suggested actual usage of technologies if they were introduced into the store environment. Retailers should be sure to assess employees' perceptions of a new technology before introducing it. Pilot studies in a few store locations or temporary *pop-up* stores might be a way of gauging employee intent to use technologies while working with customers. Observation of technology use and focus group discussions about the technologies after several weeks of use might reveal new applications for the technologies that the retailer or manufacturer of the technology did not expect. For example, in this study employee service

orientation had a positive influence on using social networking, suggesting that employees who are more interested in interacting with customers are more likely to use this technology rather than employees who are less service oriented. This was an unexpected finding since social networking involved no face-to-face contact between employees and customers and would be expected to take away from the service encounter as a less personal interaction.

New job roles may be created as technologies are introduced to accomplish innovative tasks that may not have traditionally been part of the apparel retail employee job description. For example, salespeople could serve as size experts or customer co-design consultants as technology enables the possibility of employee-customer interactions beyond sales transactions. Other new job roles may be more technology-based such as an in-store web content developer who selects and presents trends and clothing for visual display on a store's social networking site, or a virtual customer satisfaction manager who only interacts with customers via the social networking site to respond to questions or help customers design clothing using virtual images. As a result of these new roles, technology could improve service encounters with customers as employees are able to engage with them in new formats. The combination of new job roles, improved customer service and retention of employees as a result of technology use definitely warrants further study of these and other hybrid formats that can contribute to innovation in the retail workplace.

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# CHAPTER FIVE

## EMPLOYEE PERFORMANCE SUPPORT SYSTEMS: TECHNOLOGY INTERFACES THAT ENHANCE CUSTOMER SERVICE AND SUPPORT CAREER DEVELOPMENT IN APPAREL RETAIL STORES

Technological innovations had increasingly become a part of the apparel retail store environment in order to improve efficiency and customer service. Yet, there were still indications of customer dissatisfaction with store employees and high rates of employee turnover (NOBSCOT, n.d.) suggesting that more needed to be done to create a better shopping experience and work environment. Rhoads, Swinyard, Geurts and Price (2002) found that retail store managers experienced less variety in their jobs, held less autonomy and showed higher turnover intentions than retail corporate office employees. A survey of 1000 customers by Wharton's Baker Retail Initiative program and the Verde Group found that customer dissatisfaction with store employees was a major contributor to lost sales (Knowledge@Wharton, 2007). Rayport and Jaworski (2005) linked the trend in what they called "stagnant customer satisfaction ratings" over the last decade to shortages of service personnel and retail workplaces that were the equivalent of "sweatshops of a postindustrial society". They viewed both the negative workplace and shortage of skilled service personnel as strategic opportunities for the use of computers and other technologies to support and supplement work done by humans.

In-store technologies could be used as strategic opportunities to support customer service and career development at the same time. As the first contacts with retail customers, store employees serve an important role in customer service, but need to be engaged and interested. This research explored how apparel retail employees reacted to three emerging technologies

– body scanner, product configurator and social networking. It analyzed whether these technologies offered a strategic opportunity to support employees in their work as service providers while supporting career development.

**Service**

Problems with store service were the main causes of customer dissatisfaction in Wharton's study and included such customer complaints as not being able to find anyone for help, insensitivity to long lines, feeling as if one was intruding on a sales associate's time or conversation and lack of politeness. Hochschild (1983) referred to service jobs as *emotional labor*, implying the requirement of service workers to not only perform some physical tasks but also possess the ability to adjust their attitudes and personalities for the purposes of interacting with customers. Albrecht and Zemke (2002) offered some insight into why good service is such an issue in retail by pointing out that many service workers lack the "temperament, maturity, social skills, and tolerance for frequent human contact" and that after repeated interactions with customers and the accompanying pressures and stress, service workers' interactions with customers turn "toxic" (p.148). As a solution to avoid these toxic encounters, Albrecht and Zemke (2002) recommended that service workers should be hired based on their ability to perform not just generic service functions (found in a company's policy manual) but on their ability to address the specific demands and complaints of the company's customers.

Hiring employees with the necessary service focus may not solve the service problem entirely since the retail industry also has a very high turnover rate – 34.7% in 2006 (US Department of Labor, 2008), the third highest voluntary turnover rate after jobs in food service and hospitality (NOBSCOT,

n.d.). To promote retention and development of retail executives, retailers like Macy's, JC Penney and Wal-Mart ran their own in-house employee development and training programs (Reda, 2008). This same approach might be used with retail store sales associates by providing training and development, especially in innovative areas of customer service, which may encourage employees to remain in their job positions. Schlesinger and Zornitsky (1996) found that 80% of employees who were satisfied with their ability to provide customer service were also more satisfied with their jobs. The same study revealed that efforts aimed at improving employees' ability to provide service also increased job satisfaction, which the researchers predicted would lead to customer satisfaction (Schlesinger & Zornitsky,1996). Linkages between positive employee attitudes about their employer and customer satisfaction were found by Tornow and Willey (1991). Customer satisfaction with service quality has been inversely related to employee turnover rates (Ulrich, Halbrook, Meder, Stuchlik & Thorpe, 1991). These studies suggested that introducing strategies to improve retail employees' customer service skills could ultimately lead to both job satisfaction and customer satisfaction.

**Job Satisfaction & Career Development**

Retail store jobs suffer from a societal image of low pay and/or lack of career growth potential that discourages many people from considering retail as a long-term career (Swinyard,1981; Swinyard,Langrehr & Smith,1991; Broadbridge, 2003). According to the US Department of Labor (2008), retail jobs in clothing stores were the lowest paying retail positions at $8.53 per hour. Research done by Knight, Crustinger and Kim (2006) showed that apparel merchandising students already working in retail stores were more

interested in other potential retail career areas than careers in store management. In another study, retail store managers who were college graduates were found to be more dissatisfied than retail corporate office workers and they indicated that they had less autonomy and variety in their jobs and showed higher turnover intentions (Rhoads et al., 2002). Broadbridge (2003) found that students saw a retail career as having opportunities for training and development, but they also viewed retail careers as having limited career advancement. Dickerson (2003) noted that store management positions typically did not lead to other positions within a retail company (such as a merchandise buyer) beyond other in-store positions. For example, the long-term career goals identified for an assistant store manager were store manager or district manager (Dickerson, 2003).

Career ladders developed by apparel retailers also described limited options for different career options by new workers. Macy's listed their store management career path as follows: store management executive development program →Sales Manager/Group Sales Manager → Assistant Store Manager or Merchandise Team Manager → Regional Merchandise Manager or Store General Manager (macyscollege.com, n.d). Kohl's listed a similar path for its employees; from store associate → Assistant Store Manager → Store Manager → District Manager. JC Penney provided a path for their Sales Manager Trainees to obtain other positions at the company's home office, but this was the last position on the career ladder (see Appendix G).

The discontent of those working in retail jobs and the perception of retail indicated that there is a need for change in some aspects of in-store jobs. Addressing the linkage between customer service satisfaction and job

satisfaction may be a starting point for introducing change.

Albrecht and Zemke (2002) noted that customer service skills are not an innate characteristic of many retail employees. As part of the employee training and development process, areas known as knowledge, skills, abilities and other considerations, or KSAOs, were identified as part of a needs assessment in order to target training efforts (Noe, 2008). Areas which were suitable for training and development include both *knowledge* and *skills* (Noe, 2008). Similarly, the job competency listing for retail salespersons, according the Occupational Information Network (2009) identified customer service as a competency under its *knowledge* classification, instead of under its *abilities* classification. The characteristics under the *abilities* classification contained innate employee traits (not trainable) needed for the job of retail salesperson. The observation by Albrecht and Zemke (2002) that customer service was not innate to retail employees was confirmed by its classification under the *knowledge* area of retail work and this classification indicated that customer service should be a part of training and development activity for retail employees.

London (1989) distinguished the meanings of both training and development, pointing out that training was directed towards learning what employees need to know for their present job, while learning associated with development was not directed towards the current job but rather towards the long-term professional growth of employees. Development may include training classes or new job experiences (London, 1989; Noe, 2008). Employee career goals can be a significant contributor to development since goals can provide motivation to engage in development activities (Noe, 1995; Greenhaus, Callanan, & Kaplan,1995). Goal setting theory contends that

when a goal is set, behavior is altered towards attaining a goal such that people direct energy and effort over time towards strategies to achieve the goal (Locke & Latham, 1990; Noe, 2008). Noe (1995) found that employees who were further away from their career goal were more likely to engage in development activity. Knight et al. (2006) found that students working in retail jobs who had high career goals and job satisfaction were more likely to pursue a retail career. Retail employees often fill entry-level jobs, placing them at the lowest job positions within the store hierarchy. Entry-level employees who become satisfied with their jobs may decide to remain in that job and even decide to pursue a career, which involves setting a career goal and engaging in development activities to reach that goal. If retail employees were also given opportunities to engage in development activities while working in the store that would prepare them for future positions within a retail organization outside of the limited retail store career paths, they might also be more satisfied with their jobs and remain in store positions. Spanish retailer, Zara, was an example of a company that had a training and development program for its store employees that had served to fill apparel design positions – the company reported that in 2005 39% of its designers had come from store positions (Inditex,n.d.). The use of technology for improving customer service can be considered a part of a development activity. London (1989) noted that development programs “may be guided by corporate initiatives to prepare people for advancement or to ensure that employees have the opportunities needed to maintain and expand their skills” (p.2). By using certain technologies employees may be provided with training in the area of customer service, maintaining and expanding skills that will support retail employee career development.

## Conceptual Frameworks

The use of technology as part of the employee-customer service encounter in apparel retail stores involved some special considerations in terms of suitable technology formats for facilitating, rather than preventing, interaction and in terms of technology self-efficacy -- how comfortable retail employees feel using new technology in general as part of their work. Apparel retail work involved a significant amount of contact with customers and technology that supported this aspect of the job could be more valuable to the interaction of employees and customers than technology that placed a distance between the two groups (i.e. self-service technologies). Apparel retail employees' reactions to using new technology based on how comfortable they would feel using it were also important so that retailers could anticipate how much training might be necessary for a new technology and if the investment in new technology was worthwhile for their employees. *Employee sabotage*, which involved refusal to use new technology, could result if employees had low technology self-efficacy and developed negative attitudes towards using the technology (Bickers, 2008).

**Hybrid Technology Interfaces**. Hybrid interfaces referred to the use of both human and technological capabilities to complete work (Rayport & Jaworski, 2005). Depending on the type of work, either the person or the technology could be dominant in the interface – for example, a retail employee using a hand-held scanner to help a customer locate an item would be considered a people-dominant interface while an employee responding to a customer e-mail using a computer would be considered a technology-dominant interface. Froehle and Roth (2004) conceptualized how both employees and customers might interact with technology in service situations

and described five modes of interactions or interfaces. These interfaces of customer contact were further organized into *face-to-face* and *face-to-screen* contact. Face-to-face interfaces involved interpersonal contact between the customer and a service representative including: *technology-free* interface (no use of technology during service encounter), *technology-assisted* interface (technology aided the service representative to improve customer interaction), and *technology-facilitated* customer contact interface (service representative and customer both used technology to enhance the interaction). In face-to-screen contact interfaces, technology was the only point of contact, and included: *technology-mediated* interface (technology was used as the only means of interaction between customer and service representative) and *technology-generated* customer contact interface (technology substituted for service representative).

**Impact of Technology Self-Efficacy**. According to Compeau and Higgins (1995), technology self-efficacy "refers to a judgment of one's capability to use a computer [and] is not concerned with what one has done in the past, but rather with judgments of what could be done in the future" (p. 192). Venkatesh and Davis (1996) found that technology self-efficacy was a determinant of a person's perceived ease of use of computer technologies and that when given information on how to use a technology before hand, users based their ease of use ratings of computer technology solely on their technology self-efficacy and not the procedural information that was provided. A measure of technology self-efficacy considers the influence of lack of confidence in using technology in general, but it could influence a user's confidence in using a specific technology especially one that had not been used before. Technology used by employees could be influenced by

technology self-efficacy -- if they did not feel confident using a new technology, in spite of its ability to support customer service, they might be less likely to want to use it as part of their work.

**Research Questions**

This research analyzed apparel retail store employees' reactions toward emerging technologies, as a potential opportunity to support retail career development activities, especially those directed towards improvements in customer service. It was framed by two research questions**:** (1) Which emerging apparel retail store technologies can be used as strategic opportunities to support career development for employees based on employees' perceptions of each technology's usefulness for their jobs and their intention to use each technology? (2) Do employee career goals, current job roles and attitudes towards customer service influence usefulness and the intent to use technology in an apparel retail store as part of development activities?

**Apparel Retail Technologies**

Three technologies were selected for this study to represent recent advances in technology that were specifically adapted to the apparel retail store environment. It is important to note that these technologies were not yet widely used and were not merely updates of conventional retail technologies but offered strategic opportunities through their hybrid interfaces. Images of the technologies used in this study are presented in Figures 5.1, 5.2 and 5.3.

*Body Scanner.* The scanner provides information to retail employees that can help them find products that will best fit the customer. The scanning process takes place by having the customer enter an enclosed booth where white light, lasers or radio waves are used to establish the shape and

dimensions of the body. After this process the scanner can provide a visual image of customers and/ or their body measurements. By applying scan measurement data to what is called *size selection*, the scanner records customer body measurements in order to recommend clothing sizes and styles. The body scanner was considered a technology-assisted interface since the employee uses this technology, for the scanning process or for size selection, to support the task of finding the right size for the customer while customer involvement is relatively inactive.

**Figure 5.1. NX-12 Body Scanner by TC$^2$**

*Product Configurator.* The product configurator is an electronic tool where computer software enables a user to customize apparel by style or color or any other design features the retailer chooses to offer and view the changes virtually. This technology has largely been used by small niche apparel businesses and by sportswear retailers for customized footwear. Nike

was one of the first companies to offer an online customization tool for its footwear in 1999 called NIKEiD, and in 2007 they introduced the NIKEiD studio in the company's New York City store. The customer was now able to interact with employees known as design consultants to create their own footwear or apparel (PR Newswire, 2007). The configurator provided an opportunity for both the employee and the customer to creatively interact around the product as a *technology facilitated service interface*.

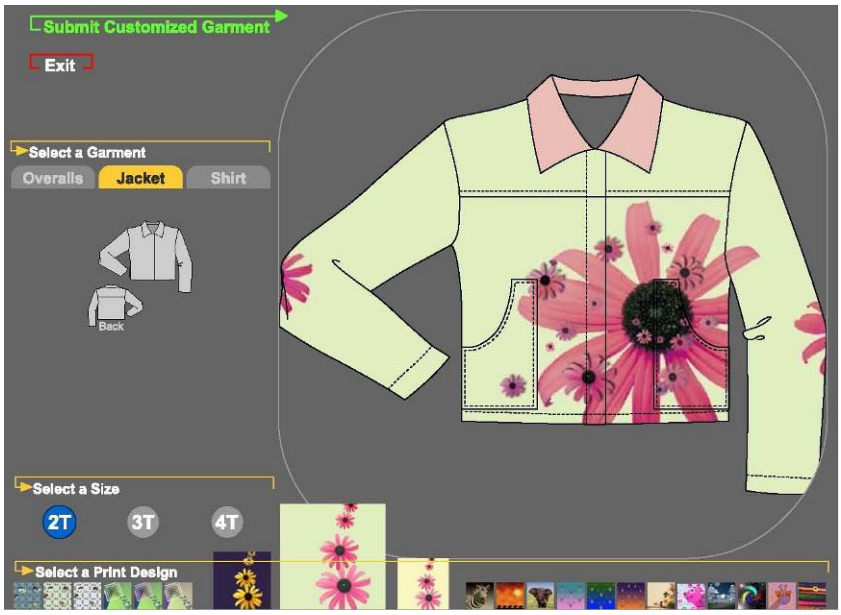


**Figure 5.2. Design Page for Jacket Style in Product Configurator**

*Social Networking*. Social networking is a web-based technology that allows subscribers to communicate with others in their same geographic area, specific group or network of acquaintances. It was the technology used for web-based services like Facebook, My Space and Second Life. For example, JC Penney recently launched its own online community for a new lingerie line in order to gather customer response to the fit and quality of its new products, asking customers to create profiles, post comments to discussion boards, and

participate in online chats with the JC Penney product team (Passenger, 2008). Other retailers like Sears and American Apparel have used a richer format of social networking in the virtual community called Second Life, where customers can view and purchase merchandise. Social networking was considered a *technology-mediated interface* where technology is the only point of contact for employees and customers.

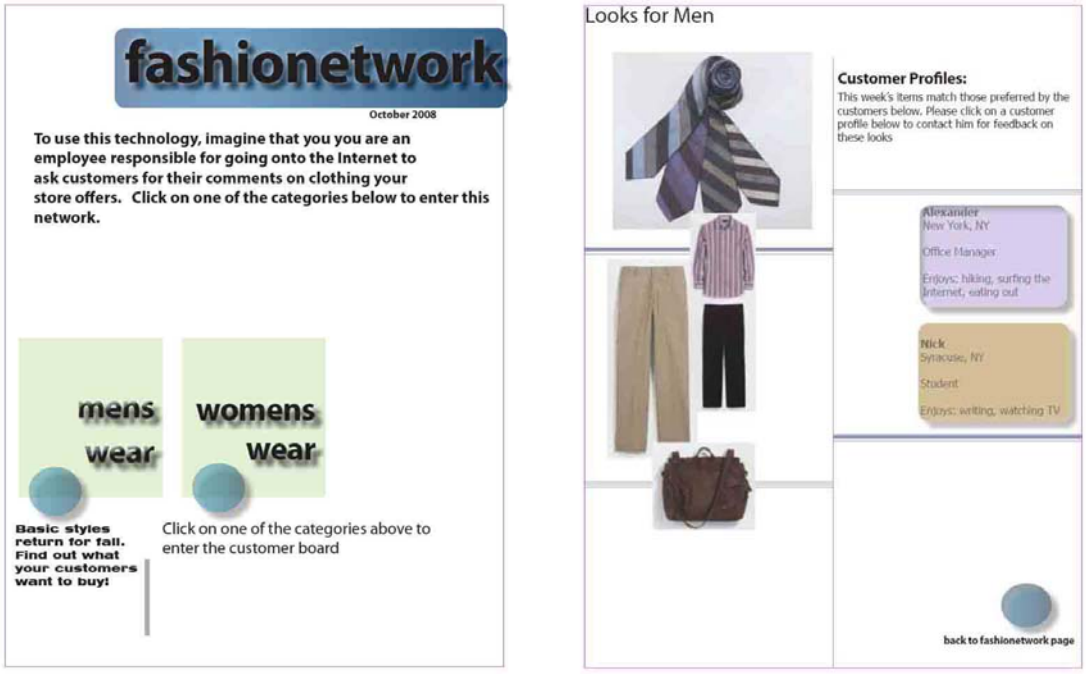


**Figure 5.3. Introduction and Customer Profile pages for Social Networking site**

## Method

Apparel retail store employees and former employees with work experience in an apparel store were recruited for the study in order to assume a base level of retail store experience. Participants completed the first section of a printed questionnaire about technology self-efficacy and service orientation and then were introduced to the technologies as the study's

treatments to provide all participants with the same basic knowledge about the technologies. Participants were shown how to use each technology by the researcher and then instructed to independently use each technology with short written directions as aids. They completed the questionnaire section specific to each technology after using it and then followed the same procedure with the second and third technologies.

The questionnaire included items and scales to measure 1) service orientation and technology self-efficacy (administered before the technology treatments), 2), usefulness of technology and behavioral intention to use technology, and 3) career and demographic information. Service orientation items consisted of those taken from the five 5-point customer orientation items ($\alpha$ = .91) developed by Susskind, Kacmar and Borchgrevink (2003) to measure customer service attitude. The ten item 10-point computer self-efficacy measurement ($\alpha$ = .95) developed by Compeau and Higgins (1995) was used to measure employee technology self-efficacy. Variables related to usefulness and behavioral intention for each technology were measured using six 7-point items for perceived usefulness ( $\alpha$ = .97) developed and validated by Davis (1989) and two 7-point items for behavioral intention ($\alpha$ = .88) from Davis, Bagozzi and Warshaw (1992). Usefulness and behavioral intention were studied by Davis et al. (1992) and both were shown to have direct positive effect on actual usage of technology. Usefulness measured the degree to which a user believed use of technology would improve job performance. Behavioral intention measured the likelihood of technology use if it was available as part of the user's job.

Scales were modified for each technology by adding the specific name of the technology. Open-ended questions were included at the end of section

two and asked participants to indicate how using the technology would make their job better and would change the way they work with customers.

Current job position and highest desired future job position were measured with two separate items developed using job labels taken from the National Retail Federation's career ladder. Additionally, one 5-point item from the Focus scale of the Career Exploration Survey (Stumpf, Colarelli, & Hartman, 1993) was used to measure employee certainty of career goal and one 5-point item adapted from the Method Instrumentality scale of the Career Exploration Survey was used to measure if use of each technology would aid the employee's career goal (Stumpf et al.,1993). Demographic information measured included participant job title, type of store, hours worked, gender, age, education and personal technology use.

**Data Collection**

Data were collected in a large mall in Central New York and a laboratory space near a university. Participants were recruited for the mall study from mall employees using flyers distributed by the main mall office and two incentives were offered: a raffle for one of three $50 gift cards and a $5 giftcard for a local restaurant for everyone who completed the study. For the laboratory study site, participants were recruited via university email listservs, in-class announcements, the research recruitment website of the university's psychology department, Craigslist and through visits to local retail stores. All prospective participants were offered a $20 incentive to complete the study.

Each site was set up with a body scanner and two laptop computers. The body scanner was operated by a desktop computer loaded with specific software for producing an image of the scanned person and extracting measurements. Participants were able to view a stored image of a body scan

and its corresponding measurements. One laptop was used for the product configurator site and the other for social networking. Participants were able to select prints and style features for three garments (shirt, overalls and jacket) using the product configurator. The social networking site consisted of a customer message board and customer profiles for both men's and women's clothing that participants could navigate as if they would be contacting a customer regarding a store's products. Although both of these sites were web-based and interactive, in this study the technologies were formatted so that participants did not need to connect to the Internet to limit technical problems.

**Results**

Sample. A total of 71 participants completed the study between the two sites – 10 at the mall site and 61 at the laboratory site. The sample included 56 females (78.1%) and 15 males (21.1%). Ages of participants ranged from 16 years to 66 years with the majority being ages 16 to 21 (59.2%). Thirty-nine participants had received some post-secondary education (54.4%). Fifty-two participants worked part-time (73%). There were 41 participants (57.8%) who were currently working in a retail store and 18 were employed as a sales associate (25.4%), 9 were assistant managers (12.7%), and 14 (19.7%) were store managers. Those working in stores with one product category, which could include men's, women's or children's clothing were placed into a group called *Specialty* and those working in stores with more than one product category were placed into a group called *All Category* stores. There were 32 (51%) participants in *Specialty* stores and 34 (48%) in *All Category* stores. Thirty participants (42.3%) had retail work experience but were not currently working in retail. This percentage of non-working participants allowed for pairwise comparisons using the t-test to compare working and non-working

employee groups on the TAM variables, service orientation and technology self-efficacy. Results are presented in the sections that follow.

Technology Use. One-way ANOVA was used to analyze results of participants' ratings for usefulness and intent to use each of the three technologies (see Table 5.1). Means were based on a Likert- type scale numbered 1 through 7 with *1* = *Strongly Disagree* and *7* = *Strongly Agree*. For usefulness, all means were well above the neutral rating (=4) indicating a positive evaluation of the technologies' usefulness in a retail store (see Table 1). Usefulness responses were significantly different across the three technologies with the body scanner receiving the highest mean score (*M* =5.86), followed by social networking *(M* = 5.39) and the product configurator (*M* = 4.86). Participants also rated the body scanner highest on their intent to use the technology. The scanner ratings *(M* = 6.16) were significantly different on behavioral intention than the product configurator (*M* =5.08) and social networking (*M* = 5.48), though all ratings were strongly positive. Pairwise comparisons for behavioral intention and usefulness for participants who were working and those not currently working only showed a significantly higher behavioral intent to use social networking ($t_{69}$=-2.63, p<.05) by the working group (*M* = 5.8) than for those not currently working (*M*= 4.9).

**Table 5.1. Mean Comparisons for Usefulness and Behavioral Intention**

| *Variable* | *F* | *Significance Level* | *Technology Type* | *N* | *Mean* | *Std Dev* | *Std Error* |
|---|---|---|---|---|---|---|---|
| USEFUL | 9.246 | .000* | Body Scanner | 71 | 5.86[a] | 1.21 | .14 |
| | | | Product Config | 70 | 4.86[b,c] | 1.67 | .20 |
| | | | Social Netwk | 70 | 5.39[a,c] | 1.20 | 14 |
| BHV INTENT | 11.089 | .000* | Body Scanner | 71 | 6.16[a] | .90 | .11 |
| | | | Product Config | 71 | 5.08[b] | 1.77 | .21 |
| | | | Social Netwk | 71 | 5.48[b] | 1.44 | .16 |

Note: Superscripts within each group represent pairwise comparisons. Means showing at least one letter in common are not significantly different at p<.05; * p<.05; All measures on a 1-7 Likert-type scale

Scores from the technology self-efficacy scale were summed, as recommended by Compeau and Higgins (1995) to capture both self-efficacy magnitude and strength (see Table 5.2). The median score for technology self-efficacy was 72 and the mean was 72.6 (*SD* = 15.0) out of 100.

**Table 5.2 Technology Self-Efficacy Means**

| | | N[a] | Technology Self-Efficacy | SD | Range | Variance |
|---|---|---|---|---|---|---|
| ***Sample*** | | 70 | 72.29 | .43 | 77 | 225.71 |
| ***Current job*** | Not working | 30 | 67.60 | 17.06 | 76 | 291.15 |
| | Sales Associate | 18 | 74.06 | 11.21 | 40 | 125.70 |
| | Manager | 23 | 77.23 | 13.35 | 49 | 178.18 |
| | *Total* | *71* | | | | |
| ***Store type*** | Specialty | 32 | 75.81* | 13.79 | 49 | 190.16 |
| | All Categories | 34 | 68.06* | 15.78 | 68 | 248.97 |
| | *Total* | *66* | | | | |
| ***Gender*** | Male | 15 | 64.27 | 20.12 | 68 | 404.92 |
| | Female | 56 | 74.47 | 12.68 | 49 | 160.70 |
| | *Total* | *71* | | | | |
| ***Age*** | 16 to 21 | 42 | 70.07 | 15.05 | 76 | 226.41 |
| | 22 to 29 | 19 | 74.37 | 15.97 | 57 | 255.14 |
| | 30+ | 10 | 78.22 | 11.69 | 35 | 136.69 |
| | *Total* | *71* | | | | |
| ***Education*** | College degree | 26 | 72.40 | 14.97 | 57 | 224.00 |
| | No degree | 45 | 72.22 | 15.22 | 76 | 231.77 |
| | *Total* | *71* | | | | |
| ***#Personal Techs*** | 1 to 6 | 24 | 71.29 | 18.66 | 74 | 348.22 |
| | 7 to 8 | 43 | 71.74 | 12.55 | 56 | 157.62 |
| | *Total* | *67* | | | | |

Note: * Means significantly different at p<.05; [a] *N* totals vary due to missing cases

Mean comparisons for technology self-efficacy based on demographics of the sample showed a significantly higher technology self-efficacy scores for employees in Specialty stores than employees in All Category stores (see Table 5.2). T-tests between employees who were working and those not currently working showed that technology self-efficacy was significantly higher for working participants ($t_{68}$ = -1.98, p<.05, *M* = 75.8) than for participants who were not working (*M* = 68.3).The influence of technology self-efficacy on behavioral intention to use each of the technologies was tested using

regression analysis. The results indicated that technology self-efficacy influenced intent to use both the product configurator, $t_{68}$=2.54, p<.05, $\beta$=.29 and social networking $t_{68}$ = 2.98, p<.05,$\beta$ = .34. Technology self-efficacy level was also compared to the number of personal technologies participants indicated they used which included *personal computer, mp3 players, digital camera, personal digital assistant (PDA), gaming system, social networks, cell phones* and *web design*. Most of the sample used six or more of the technologies (77.5%, *n*=55). One–way ANOVA was used to examine the relationship of technology self-efficacy level and number of technologies used, 1 to 6 technologies (*n*=24) or 7 to 8 technologies (*n*=43), and the results did not show a significant association between the number of technologies and level of technology self-efficacy, F(1,65)=.06, p = .82.

*Service Orientation.* The mean service orientation for the sample was 4.7 (*SD* = .4, *range* = 1.8), based on a 1 – 5 Likert-type scale where *1* = *Strongly Disagree* and *5* = *Strongly Agree* (see Table 5.3). Mean comparisons using one-way ANOVA and t-tests were used to test for significant differences between participants' service orientation based on the variables of age, gender, education, current job, and store type (see Table 5.3). Gender ($t_{69}$=2.3, p<.05), education level ($t_{69}$= -2.3, p<.05) and store type ($t_{64}$= 2.5, p<.05) showed significant differences, with women having a higher average service orientation (*M* = 4.7) than men (*M* = 4.5); those with a college degree having a significantly higher service orientation (*M* = 4.8) than those without a college degree *(M* =4.6); and those working in Specialty stores with one apparel product category (*M* =4.8) significantly higher than those working in All Category stores with two or more different apparel categories (*M* =4.5). Additionally, pairwise comparisons using the t-test showed that employees

who were currently working (n=41) had significantly higher service orientation, $t_{69}$ = -1.99,p<.05, (*M* = 4.8) than participants who were not currently working (n=30, *M*= 4.6).

**Table 5.3. Service Orientation Means**

| | | *N*[a] | Service Orientation | SD | Range | Variance |
|---|---|---|---|---|---|---|
| ***Sample*** | | 71 | 4.68 | .43 | 1.80 | .18 |
| ***Current job*** | Not working | 30 | 4.56 | .49 | 1.80 | .25 |
| | Sales Associate | 18 | 4.69 | .40 | 1.40 | .16 |
| | Manager | 23 | 4.83 | .31 | 1.00 | .10 |
| | ***Total*** | 71 | | | | |
| ***Store type*** | Specialty | 32 | 4.80* | .34 | 1.40 | .12 |
| | All Category | 34 | 4.55* | .49 | 1.80 | .24 |
| | ***Total*** | 66 | | | | |
| ***Gender*** | Male | 15 | 4.46* | .54 | 1.80 | .30 |
| | Female | 56 | 4.74* | .38 | 1.40 | .14 |
| | *Total* | 71 | | | | |
| ***Age*** | 16 to 21 | 42 | 4.60 | .48 | 1.80 | .23 |
| | 22 to 29 | 19 | 4.76 | .32 | 1.00 | .11 |
| | 30+ | 10 | 4.86 | .33 | 1.00 | .11 |
| | ***Total*** | 71 | | | | |
| ***Education*** | College degree | 26 | 4.81* | .29 | 1.00 | .09 |
| | No degree | 45 | 4.60* | .48 | 1.80 | .23 |
| | ***Total*** | 71 | | | | |

Note:*means significantly different at p<.05, based on 1-5 Likert-Type Scale.
[a]*N* totals vary due to missing cases.

*General Linear Model*. To test the influence of employee attitudes toward customer service, or service orientation, on behavioral intention and usefulness for each of the technologies, the GLM procedure in SPSS was used controlling for both store type and the employee's current job position. The GLM results did not show any significant effect by service orientation alone on behavioral intention or usefulness. However, the interaction effects on usefulness by service orientation with current job position and service

orientation with store type were significant for the body scanner F(2,66) = 3.32, p<.05 (see Table 5.4).

**Table 5.4. GLM Results for Body Scanner**

| Source | | Dependent Variables | *df* | Sum of Squares | Mean Square | *F* |
|---|---|---|---|---|---|---|
| Model | | USF | 9 | 24.64 | 2.74 | 2.28* |
| | | BI | 9 | 10.10 | 1.12 | 1.45 |
| $R^2$ | | | | | | |
| | .27 | USF | | | | |
| | .19 | BI | | | | |

| Source | | *df* | Type III Sum of Squares | Mean Square | *F* |
|---|---|---|---|---|---|
| Current job | USF | 2 | 7.98 | 3.99 | 3.32* |
| | BI | 2 | 1.66 | .83 | 1.07 |
| Store type | USF | 1 | 4.75 | 4.75 | 3.94* |
| | BI | 1 | 1.38 | 1.38 | 1.79 |
| Service orientation | USF | 1 | .41 | .41 | .34 |
| | BI | 1 | .06 | .06 | .08 |
| Current X Store type | USF | 2 | 11.08 | 5.54 | 4.60* |
| | BI | 2 | 2.82 | 1.41 | 1.82 |
| Current X Service Orientation | | | | | |
| | USF | 2 | 8.00 | 4.00 | 3.32* |
| | BI | 2 | 1.52 | .76 | .98 |
| Store type X Service Orientation | | | | | |
| | USF | 1 | 5.74 | 5.74 | 4.77* |
| | BI | 1 | 1.60 | 1.60 | 2.07 |

Note: *p<.05

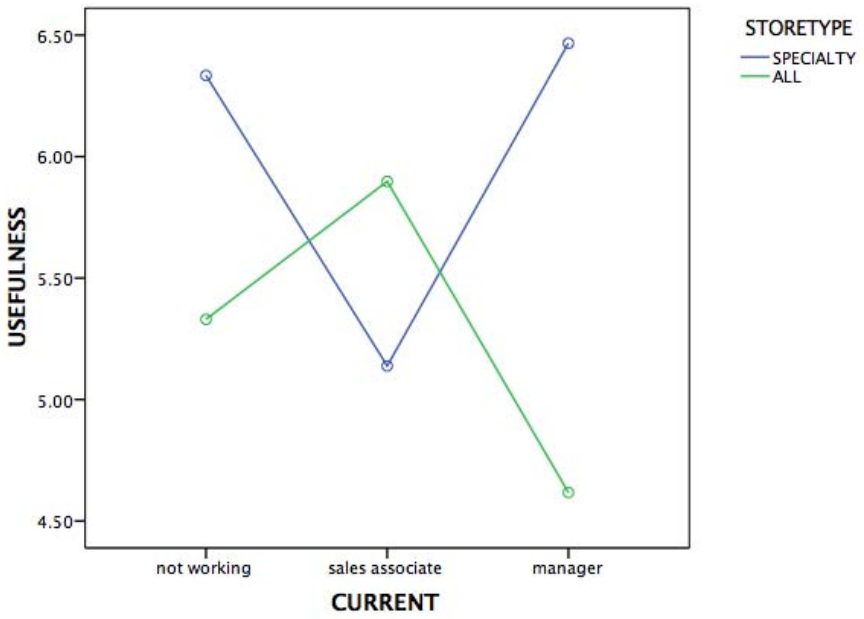


**Figure 5.4. Usefulness Means for Body Scanner based on Participant Current Job and Store Type**

Significant effects were found for usefulness of social *networking* based on the interaction effect of employee's current job with store type (see Table 5). Also current job position and the interaction effect of current job and store type significantly influenced usefulness for the body scanner (see Table 5.4). No significant effects were found for the product configurator for usefulness and no significant effects were found for behavioral intention among any of the technologies. Mean comparisons. Pairwise mean comparisons showed that managers (*M*= 5.54) had a significantly higher mean (t = -2.26, p<.05) for the usefulness of the body scanner than sales associates (M = 5.52). Significant differences (t = -2.83, p<.05) were also found between sales associates who worked in *Specialty* and *All Category* store types. Sales associates in *All Category* stores indicated higher usefulness (*M* = 5.90) than those in *Specialty* stores (*M* = 5.14) for the body scanner (see Figure 5.4). For social networking the significant difference (t = -2.85, p<.05) was found between participants in

the not working group (see Figure 5.6). Participants who were not currently working but had worked in an *All Category* store indicated higher usefulness (t =-2.85, p<.01) for social networking (*M* = 5.19) than not working employees who had worked in a *Specialty* store (*M* = 5.12).

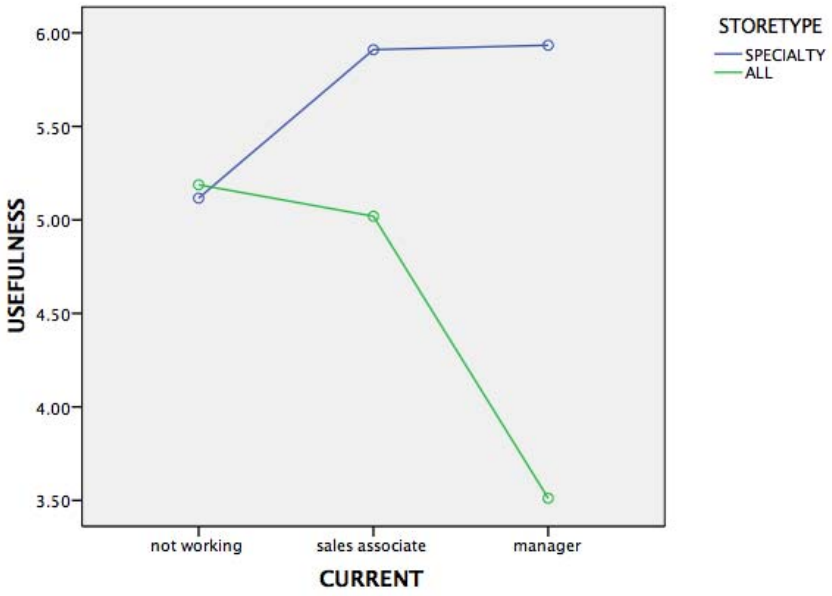


**Figure 5.5. Usefulness Means for Social Networking based on Participant Current Job and Store Type**

The interaction effect of service orientation with current job position indicated significant differences for usefulness of the body scanner between sales associates and store managers (t = 2.47, p<.05). The interaction of sales associate positions with service orientation showed higher usefulness for the body scanner than the interaction of service orientation with store managers.

**Table 5.5. GLM Results for Product Configurator**

| Source | | *df* | Sum of Squares | Mean Square | *F* |
|---|---|---|---|---|---|
| Model | USF | 9 | 18.06 | 2..01 | .70 |
| | BI | 9 | 12.25 | 1.36 | .38 |
| $R^2$ | | | | | |
| .10 | USF | | | | |
| .06 | BI | | | | |

| Source | | *df* | Type III Sum of Squares | Mean Square | *F* |
|---|---|---|---|---|---|
| Current job | USF | 2 | 1.02 | .51 | .18 |
| | BI | 2 | .02 | .01 | .00 |
| Store type | USF | 1 | .02 | .02 | .01 |
| | BI | 1 | 1.11 | 1.11 | .31 |
| Service orientation | USF | 1 | .48 | .48 | .17 |
| | BI | 1 | 3.43 | 3.43 | .95 |
| Current X Store type | | | | | |
| | USF | 2 | 8.83 | 4.43 | 1.54 |
| | BI | 2 | 1.34 | .67 | .19 |
| Current X Service Orientation | | | | | |
| | USF | 2 | 1.37 | .69 | .24 |
| | BI | 2 | .02 | .01 | .00 |
| Store type X Service Orientation | | | | | |
| | USF | 1 | .02 | .02 | .01 |
| | BI | 1 | .99 | .99 | .28 |

**Table 5.6. GLM Results for Social Networking**

| Source | | *df* | Sum of Squares | Mean Square | *F* |
|---|---|---|---|---|---|
| Model | USF | 9 | 24.80 | 2.93 | 2.34* |
| | BI | 9 | 26.78 | 2.12 | 2.12* |
| $R^2$ | | | | | |
| .28 | USF | | | | |
| .26 | BI | | | | |

| Source | | *df* | Type III Sum of Squares | Mean Square | *F* |
|---|---|---|---|---|---|
| Current job | USF | 2 | .01 | .01 | .00 |
| | BI | 2 | 3.71 | 1.86 | 1.16 |
| Store type | USF | 1 | .02 | .02 | .01 |
| | BI | 1 | .07 | .07 | .05 |
| Service orientation | USF | 1 | 1.69 | 1.69 | 1.35 |
| | BI | 1 | 1.97 | 1.97 | 1.23 |
| Current X Store type | USF | 2 | 10.28 | 5.14 | 4.10* |
| | BI | 2 | 4.42 | 2.21 | 1.38 |
| Current X Service Orientation | | | | | |
| | USF | 2 | .04 | .02 | .02 |
| | BI | 2 | 2.89 | 1.44 | .90 |
| Store type X Service Orientation | | | | | |
| | USF | 1 | .18 | .18 | .15 |
| | BI | 1 | .18 | .18 | .11 |

Note: *p<.05

There was also a significant difference for the interaction between store types with service orientation for usefulness of the body scanner. The interaction of *Specialty* store types and service orientation showed higher usefulness for the body scanner than the interaction with *All Category* store types ($t = 2.18$, $p < .05$).

*Employed Participants*. To ensure that the effects of participants who were not employed did not significantly alter the GLM results. The analysis was also conducted with data only from the employed participants (n = 41) which consisted of sales associates (n = 18) and store managers (n = 23). The significant results were similar for both the body scanner and social networking, and no significant effects were found for the product configurator. For the body scanner significant differences were found based on current job position ($t = -2.16$, $p < .05$), sales associates ($M = 5.75$) indicated less usefulness for the body scanner than store managers ($M = 6.11$).

The interaction effect of store type with current job on usefulness was significant for both the body scanner $F(1,32) = 8.28$, $p < .05$ and social networking $F(1,32) = 5.11$, $p < .05$. For the body scanner, sales associates in *Specialty* stores showed less usefulness (M = 5.32) for the body scanner than sales associates in *All Category* stores (M = 5.95) and managers in *Specialty* stores (M = 6.43) indicated greater usefulness for the body scanner than managers in *All Category* stores (M = 4.36). For social networking, usefulness was lower for sales associates in *All Category* stores (M = 5.01) than for sales associates in *Specialty* stores (M = 6.03) while it was higher for managers in *specialty* stores (M = 5.94) compared to managers in *All Category* stores (M = 3.22).

Service orientation interaction effects with current job position was

significant for the body scanner F (1,32) = 5.41,p<.05. For the body scanner, usefulness was significantly (t = 2.33, p<.05) higher for the interaction of sales associates with service orientation than for store managers. For social networking, usefulness was significantly higher for the interaction of *Specialty* stores with service orientation than for *All* Category stores (t = 2.06, p<.05).

*Future Jobs.* A new variable called *delta job* was created to represent the distance in the number of job positions between the current and future job levels. The separate measures for employees' current job and highest desired future job were used to create the new variable by using the difference in the number of positions between one's current job and the desired future job. Current and future job choices included seven positions ranging from *Sales Associate* to *Regional Vice President,* so possible delta jobs scores could range from 0 to 6, where *0* indicated no desired job change beyond one's current position. For this sample (*N* = 70, *range* = 2), most participants wanted to remain in their current job (n=24, 33.8%) or advance one position (n=29, 40.8%), and fewer participants (n=17, 23.9%) wanted to advance two or more positions.

The GLM procedure in SPSS was used to examine the effect of delta job, certainty of the career goal and certainty that using each technology would help one reach the career goal on usefulness and behavioral intention. The results showed that for all three technologies, employees' certainty that the technology would help them attain their career goal was a significant influence on both behavioral intention and usefulness. The influence of *deltajob* on behavioral intention and usefulness was significant for the body scanner (see Table 5.7) but not the product configurator (see Table 5.8) or social networking (see Table 5.9). Mean comparisons showed that the ratings for usefulness of

the body scanner were significantly lower for those wanting to advance two or more positions (*M* = 5.48, p<.05) than for either those wanting to remain in their current jobs (*M* = 6.20) or to advance one job position (*M* = 6.47). Behavioral intention to use the scanner was also lower for those wanting to advance two or more positions (*M* = 5.03, p<.05) compared to those who wanted to stay in their current job (*M* =6.07) or advance one position (*M* = 6.09).

**Table 5.7. GLM Results for Body Scanner**

| Source | | *df* | Sum of Squares | Mean Square | *F* |
|---|---|---|---|---|---|
| Model | | | | | |
| | USF | 8 | 35.97 | 4.50 | 4.07* |
| | BI | 8 | 25.02 | 3.13 | 6.17* |
| $R^2$ | | | | | |
| .35 | USF | | | | |
| .45 | BI | | | | |

| Source | | *df* | Type III Sum of Squares | Mean Square | *F* |
|---|---|---|---|---|---|
| Δ Job | | | | | |
| | USF | 2 | 8.45 | 4.23 | 3.83* |
| | BI | 2 | 6.02 | 3.01 | 5.94* |
| Certainty of career goal | | | | | |
| | USF | 1 | 1.88 | 1.88 | 1.70 |
| | BI | 1 | .82 | .82 | 1.62 |
| Technology will help goal | | | | | |
| | USF | 1 | 27.98 | 27.98 | 25.35* |
| | BI | 1 | 15.82 | 15.82 | 31.20* |
| Δ Job X Certainty of career goal | | | | | |
| | USF | 2 | 1.84 | .92 | .84 |
| | BI | 2 | 1.63 | .81 | 1.61 |
| Δ Job X Technology help with goal | | | | | |
| | USF | 2 | 4.57 | 2.28 | 2.07 |
| | BI | 2 | 3.10 | 1.55 | 3.10 |

Note: *p<.05

**Table 5.8. GLM Results for Product Configurator**

| Source | | *df* | Sum of Squares | Mean Square | *F* |
|---|---|---|---|---|---|
| Model | | | | | |
| | USF | 8 | 48.70 | 6.09 | 2.58* |
| | BI | 8 | 34.01 | 4.25 | 1.50 |
| $R^2$ | | | | | |
| .26 | USF | | | | |
| .17 | BI | | | | |

| Source | | *df* | Type III Sum of Squares | Mean Square | *F* |
|---|---|---|---|---|---|
| Δ Job | | | | | |
| | USF | 2 | 5.62 | 2.81 | 1.19 |
| | BI | 2 | .95 | .48 | .17 |
| Certainty of career goal | | | | | |
| | USF | 1 | .24 | .24 | .10 |
| | BI | 1 | .57 | .57 | .20 |
| Technology will help goal | | | | | |
| | USF | 1 | 40.38 | 40.38 | 17.09* |
| | BI | 1 | 20.55 | 20.55 | 7.23* |
| Δ Job X Certainty of career goal | | | | | |
| | USF | 2 | 2.28 | 1.14 | .48 |
| | BI | 2 | 1.40 | .70 | .25 |
| Δ Job X Technology help with goal | | | | | |
| | USF | 2 | 1.10 | .55 | .23 |
| | BI | 2 | .99 | .50 | .17 |

Note: *p<.05

**Table 5.9. GLM Results for Social Networking**

| Source | | | *df* | Sum of Squares | Mean Square | *F* |
|---|---|---|---|---|---|---|
| Model | | | | | | |
| | | USF | 8 | 40.50 | 5.06 | 5.11* |
| | | BI | 8 | 50.26 | 6.28 | 5.31* |
| $R^2$ | | | | | | |
| | .41 | USF | | | | |
| | .42 | BI | | | | |

| Source | | *df* | Type III Sum of Squares | Mean Square | *F* |
|---|---|---|---|---|---|
| ∆ Job | | | | | |
| | USF | 2 | .94 | .47 | .48 |
| | BI | 2 | 5.27 | 2.63 | 2.23 |
| Certainty of career goal | | | | | |
| | USF | 1 | .06 | .06 | .06 |
| | BI | 1 | .01 | .01 | .01 |
| Technology will help goal | | | | | |
| | USF | 1 | 29.84 | 29.84 | 30.08* |
| | BI | 1 | 31.25 | 31.25 | 26.44* |
| ∆ Job X Certainty of career goal | | | | | |
| | USF | 2 | 2.09 | 1.05 | 1.06 |
| | BI | 2 | 2.89 | 1.45 | 1.22 |
| ∆ Job X Technology help with goal | | | | | |
| | USF | 2 | .36 | .18 | .18 |
| | BI | 2 | 4.97 | 2.48 | 2.10 |

Note: *p<.05

**Qualitative Data Analysis**

Participant responses to open-ended questions provided additional information on the significance of the technologies as part of customer service and career development. Participants were asked to respond to the following two questions: (1) “how would you imagine this technology helping you do your job better?” and (2) “how would using this technology change the way you work with customers?” Open-ended questions were transcribed from the questionnaire for each subject by technology type. The researcher did not develop any preconceived expectations regarding findings for the two questions, so all questions were reviewed for key terms that were found in the responses. Once terms were identified they were listed and compared for redundancy. Similar terms were combined and the responses were reviewed a second time to verify the assignment of relevant terms to responses. For example, broader themes like *service* accounted for responses that contained terms like “it would help me help the customer…,” indicating that the participant thought of the technology in terms of customer service. Responses also contained words like “quickly” or “not waste time” that were placed under the theme of *efficiency*. Once terms were assigned, they were then coded for frequency of occurrence and the data were examined for emerging themes (see Table 5.10).

**Table 5.10. How Technologies Improve Work and Change Customer Interaction for Employees**

| Technology | # Key Terms | Themes |
|---|---|---|
| ***Body Scanner*** | | **Q1** |
| *N*=70 | 26 | Efficiency<br>Fit<br>Service<br>Accuracy |
| | | **Q2** |
| *N*=68 | 26 | Service<br>Customer reaction<br>Accuracy<br>Efficiency<br>Less intrusive<br>Customer Confidence<br>Relationship building |
| ***Product Configurator*** | | **Q1** |
| *N*=70 | 11 | Service<br>Variety<br>Knowledge<br>Design<br>Task support |
| | | **Q2** |
| *N*=67 | 26 | Interaction<br>Service<br>Personalized shopping experience<br>Customer knowledge<br>Personable |
| ***Social Networking*** | | **Q1** |
| *N*=69 | 23 | Feedback<br>Alert customers<br>Constant contact<br>Educate employee<br>Advertising focus |
| | | **Q2** |
| *N*=67 | 18 | Personal<br>Insight on preferences<br>Employee growth<br>Improve relationships<br>Efficiency<br>Knowledge<br>Service |

For the body scanner, question one had twenty-six key terms, which resulted in four themes: accuracy, efficiency, fit and service. For question two, twenty-six key terms were found and seven themes emerged: *accuracy, customer reaction, efficiency, less intrusive, relationship building, service* and *customer confidence*. For the product configurator, eleven key terms were found and five themes identified for question one: *design, task support, knowledge, service*, and *variety*. For question two, twenty-six key terms were found for the product configurator and five themes: *customer knowledge, interaction, more personalized shopping experience, personable* and *service.* Question one for social networking had twenty-three key terms and five themes: *advertising focus, alert customers, constant contact, educate employee*, and *feedback*. Question two for social networking resulted in eighteen key terms and seven themes: *improve relationships, insight on preferences, personal, service, efficiency, knowledge* and *employee growth.*

**Discussion**

Positive employee ratings for usefulness and intent to use all of the technologies in this study showed the potential for the use of emerging technology in the retail store due to employee acceptance. The body scanner had the highest ratings for usefulness and intent to use. This could be due to its function as supporting a task most apparel retail employees already perform – finding a customer's correct size – but its value may also be in providing employees with accurate and timely information that allows them to help more customers or perform other job duties. Finding the right size can lead to a good fit for a customer and also lead to a rewarding service experience for employees as customers express their satisfaction or gratitude.

While the body scanner was rated significantly higher than the other

two technologies, the product configurator and social networking received positive response from participants with mean scores for behavioral intention and usefulness of both technologies all above the neutral point on the 7-point scale. The product configurator and social networking applications did not apply as much to current job tasks, but the positive responses to these technologies suggest that retail employees did perceive some value in using them in the future.

The sample possessed a fairly high level of technology self-efficacy (*M*=72.6) but it was not related to the number of personal technologies used by participants. There was a significant difference in technology self-efficacy by store type with those working in Specialty stores indicating a higher level of self-efficacy than those in *All* product stores. This difference might be related to the types of technologies used in these different store types. Perhaps Specialty stores have more store-level technology than stores with more than one product category or employees in these stores may have different tasks related to technology. Technology self-efficacy significantly influenced behavioral intention to use the product configurator and social networking but not the body scanner. This finding may suggest that participants viewed the product configurator and social networking as more difficult to use than the body scanner. Both the product configurator and social networking required participants to spend more time navigating the software to select options and this may have influenced behavioral intention to use the technologies since a higher level of technology self-efficacy may have been required to navigate the software for these two technologies

Career aspirations were not very high for the sample as most participants indicated wanting to stay in their current job or only advance one

or two positions. In spite of low career aspirations, participants expressed intent to use a technology if it would help with their career goals, reflecting Noe's (1996) position that employees were likely to engage in development activities when focused on their career goals. Given the high ratings of intent to use all the technologies in this study, an opportunity may exist for introducing these emerging technologies as development tools that provide employees with not only a means to reach their short-term career goals but also encourage long-term employment by providing the necessary skills for improving customer satisfaction. The result could be to greater job satisfaction and possibly reduced turnover intention. If employees used a technology for its ability to support their career goals and the technology also served to improve the employee's work performance or customer service, job satisfaction may increase. If employees are happy with their jobs they may be less inclined to leave a company. Beyond the three technologies examined in this study, other technologies that support career goals of apparel retail employees may also serve to increase job satisfaction and retention. These may even include technologies that employees can access during non-work periods or *downtime* to gain knowledge required for a new job position or training for skills related to their current job. For example, employees might be able to access training modules or simulations through point-of-sale terminals and monitors or use mobile devices like mp3 players or personal data assistants (PDAs) to review product information on store items.

The influence of delta job on behavioral intent and usefulness for the body scanner showed that participants further away from their future job position indicated lower intent to use the scanner and did not see it as being as useful compared to those closer to their desired future job position. This

result contradicts Noe's (1996) finding that employees further from their career goals were more likely to engage in development activity. The desire to advance two or more positions represented a move into management roles, so using a technology that may be affiliated with tasks performed by a sales associate (finding the correct size of a garment) may not seem as appealing for employees who wanted more management responsibilities. Examining the themes from the open-ended responses shows that areas associated with learning (knowledge, educate) were attributed to the product configurator and social networking but not the body scanner and learning may be an important part of a career goal strategy for people who want to assume management positions. The product configurator and social networking may be perceived as more interactive technologies that allow employees to add their own content, creativity or preferences. The body scanner was less interactive since it provided information but did not permit any employee input based on preferences or creativity. Technology interfaces that are more interactive, like the technology-facilitated and technology-mediated formats, may help advance learning and knowledge needed for employee development activities more technology-assisted formats (like the body scanner or a cash register) that only help support work.

Service orientation of participants was high ($M$ = 4.7) representing an understanding of the importance of meeting customer needs by the sample in general. Service orientation did not have a direct impact on either usefulness or intent to use any of the technologies, which may have been due to the lack of variability in the overall service orientation scores for the sample, making it difficult to detect any differences and thus likely to lead to less meaningful results. However, service orientation did moderate the effects of job position

and store type for both the body scanner and social networking (employed group only) which may suggest that customer service attitudes across the apparel retail industry vary within stores by job position and also between different store types. Job tasks that vary by position and company policies regarding customer service may influence how apparel retail employees interact with customers and subsequently how they perceive the benefits of technology for those interactions.

Open-ended responses reflected participants' perceptions of service capability for each of the technologies. Service emerged as a theme for the body scanner and product configurator.

***Body Scanner.*** For the body scanner, service was also related to the other themes identified for how employees thought the scanner would help them do their job better (Q1) and change the way they worked with customers (Q2). Being more accurate in providing size and fit information and using less time to measure customers or help them try on clothing (efficiency) were all part of store service as one subject's response demonstrates:

> It would be simple to find sizes that are appropriate for each customer. Once we had the information in our database we could pull it up and help customers easily find what they need. They might not even try things on (or have a need to). Would cut down on shopping time – making it easier for customers.(Subject #25, Specialty store, manager)

Another participant commented on the scanner's capabilities regarding specific tasks that she performed and how they would change:

> It could provide measurements that I couldn't determine just by looking at someone. I would probably fold less clothes because people would not have to try as many to get the right size. (Subejct #41,Specialty

store, not currently working in retail)

For this subject her job would improve by reducing ambiguity in determining customer sizes and the amount of attention spent on maintaining merchandise displays. For question two, regarding how using the scanner would change how employees work with customers, the scanner was frequently viewed as a way to improve the overall service encounter based on the customer's reaction to the technology. One participant stated:

> It could be more interactive – a joint experience with the employee where they (customers) feel the store is attuned to their needs – a plus. [It] would make customers perhaps able to focus on the clothes themselves and what would look best on their body type. I could show them things that would suit them best. The customers would probably enjoy it – makes a fun experience. (Subject #45, *All* Category store, sales associate)

Comments from these participants represented those working in store and job categories that indicated a higher usefulness for the body scanner. Managers from specialty stores and those not currently working in specialty stores, both rated the body scanner higher for usefulness than sales associates in specialty stores. Sales associates in stores with more than one product category (*All Category*) rated the scanner higher for usefulness than managers for the same store type, they also rated it higher than sales associates in specialty stores. *Specialty* store participants had a significantly higher service orientation than *All* Category stores, but sales associates in these stores may not have found the scanner as useful in these environments where the product assortment is pretty focused and sizes may be consistent. Sales associates in *All* Category stores may have to deal with various product

lines that may have different sizes and fit different types of customers, so for these stores the scanner may be more valuable as a way to manage service among all the different product categories. In this context the body scanner is being used in its hybrid *technology-assisted* context – helping/supporting employees' job tasks.

One participant that had previously worked in a sports apparel store (All Category) expressed that the body scanner would not help support work because of the types of products sold at the store.

> Because I don't work in a store where particular clothing items can be fitted to the customer and most customers find their sizes on their own it most likely would not help in a great capacity (Subject #60, *All* Category store, not working).

Overall, open-ended responses for the body scanner indicated that this technology was viewed as a useful tool for supporting tasks related to customer service. It could provide job satisfaction as employees enjoyed the experience of working with customers and/or the reduced amount of time they spent looking for clothing items or returning them to their proper location in the store. However, product type may limit the employee's perception of usefulness for the scanner.

***Product Configurator.*** Service was also identified as a very frequent theme for the product configurator in terms of how it could make an employee's job better (Q1). Aspects of service it was identified to improve most were helping to satisfy customer's preferences for a specific style and to address customer desire for out-of-stock items. In some cases, using the technology with the customer was also viewed as an opportunity for the employee to learn about the customer:

> By having customers go through the application and seeing what options are available, I would be better able to understand what sort of clothing the customer wants. (Subject #24, *All Category* store, not working)
>
> It would help me get experience helping customers put various garments and styles together in a way that would be satisfying to the customer. (Subject #37, All Category store, sales associate)

However, the product configurator was not seen as a tool to support customer service for some participants who stated that since their stores did not already offer customization services the technology would not help improve their work.

> We don't customize clothing, so it wouldn't help with anything, but if we did, it looks like an easy program to learn and it would be fun (Subject #17, *Specialty* store, Sales Associate).
>
> My job does not require product development, so I would not find it useful (Subject #52, *Specialty* store, store manager).

For question two, service remained a dominant theme for the product configurator and participants often related how the product configurator would change the service encounter in terms of how the encounter would become more interactive and personal:

> It would make the job even more intimate than it already is, which is a great way to truly build loyal consumers. It would make each interaction very personalized." (Subject #27,Specialty store, not working)
>
> I would probably have a closer relationship with the customer aiding them with customizing clothing to their specific needs/wants. (Subject #51, All Category store, not working)
>
> The results for the product configurator showed that it can be a tool for

increased interaction among customers and employees, especially since employees have identified it as a way to make their service more personal. The enhanced interaction described for this technology is a key feature for *technology-facilitated* service encounters (Froehle & Roth, 2004). This could consequently improve the quality of service as employees gained more experience in establishing a personal rapport with customers over time that could allow them to respond more effectively to specific customer demands and needs (Albrecht & Zemke, 2002). While the product configurator was identified as a tool for customizing clothing, employees saw it as a technology that was also able to provide information on how to select items for customers. This additional application of the technology could be helpful for conveying its usefulness to employees who did not think that the product configurator would help with any task except customization or product development.

***Social Networking***. While service was a theme for social networking, other themes were more prevalent and were related to communication (getting feedback, notifying customers and communicating one-on-one). For question one, alerting customers for marketing and sales purposes, and getting feedback from customers were frequently given by participants as ways of making their jobs better:

> This would be awesome for our suit sales because we have to mail out hundreds of postcards, this would save time and money. (Subject #5, Specialty store, manager)
>
> Knowing what people in the surrounding area of my store want to buy would allow the buyers for my store to purchase goods that will move faster, make more money and have a more fluid and thus, exciting and large inventory. (Subject #33, All Category store, sales associate)

Responses to question one also showed that some participants could not relate use of social networking with their current job roles or viewed its feedback capacity as limited to product information only and therefore did not view it as helping their work.

> I'm not sure how it would help me as a salesperson, other than to push popular products. I think it would be more helpful for a buyer (Subject #49, All Category store, sales associate).
>
> I could not as a sales associate, gathering feedback about clothing would not help me do my job better. I would need feedback about service (Subject #54, All Category store, sales associate).

Although social networking did not involve any face-to face contact with customers, participants often indicated that it would change the way they work with customers (Q2) by making the interaction more personal. Personalizing customer service was something participants felt capable of doing because social networking would provide advanced information of customers' preferences and allow employees to adjust product or service offerings accordingly:

> I would know of their preferences for styles and cater to it by making suggestions of clothing that fit their styles instead of guessing blindly. (Subject #66, All Category store, not working)
>
> I might know them more personally. I could customize my sales tactics to their personalities. (Subject #49, All Category store, sales associate
>
> I would probably get a better sense of what is in demand/decline and how people feel about the products, and using this I could more easily interact with customers. (Subject #51, All Category store, not working)
>
> Based on these comments, social networking may be a valuable

technology due to its feedback capacity. Results that showed employees' ratings of usefulness for social networking increased with higher job positions in *Specialty* stores and decreased with higher job positions for those in *All Category* stores may caution that too much feedback may be daunting. For example a store with more than product category likely has more variety of customers (mass retailers, department stores) and management may have the responsibility of handling follow up with all of their tastes and preferences, which could be challenging. One respondent actually indicated this in her response to question one:

> In a smaller store – this would be great. However, I have experience in department stores, there are too many customers to be able to effectively reach them. I don't think it would help me do my job better. (Subject #53, All Category store, not working)

Employees of *Specialty* stores may already be more familiar with their customers and products so having social networking as a tool may be viewed as a way to augment this existing focus on customer and product. These stores may already have other technologies in place (phone, email) to reach their customers so the task of contacting customers is not a new concept and social networking may be viewed as a new and better way to do this:

> As of late, we have been using emails to contact our customers. This is a much more in-depth concept to help us communicate. (Subject #3, Specialty store, manager)
>
> Our store prides itself on customer obsession. We already use reports to contact our top customers, but this would streamline that effort! (Subject #13, Specialty store, manager)

Social networking is a *technology-mediated* interface much like email where

the computer is the only source of communication for the employee and customer. However, the additional features of social networking that allow for the posting of profiles and storage of customer preferences provide more points of interaction for employees and customers. For example an employee may notify a customer of a specific item on sale if the customer's profile indicates a preference for that item.

**Technology Applications for Training & Development**

This study examined hybrid technology interfaces and their ability to support apparel retail employees as they interact with customers. These technologies were evaluated to determine which would provide a strategic opportunity for career development purposes and which retail employee variables might influence the use of technology for those purposes. The body scanner, a technology-assisted interface, was the highest rated technology in terms of usefulness and intent to use, but earned lower usefulness and intent ratings among those wanting to advance into higher job positions (i.e. management). These results suggest that it may only be a technology interface for those mainly at the sales associate level. Participant comments indicated that the scanner could support job tasks by making work faster and accurate. The body scanner might then be compared to other technology-assisted store technologies like point-of-sale systems or hand-held bar code scanners that help expedite customer transactions. These technologies help increase efficiency in the retail store by making transactions faster for both the employee and the customer. Technology-assisted interfaces may reinforce employee job tasks by helping retail employees do them better. For example if a new employee needs to learn the fit of different styles of pants offered by a retailer, repeated use of the body scanner that allows him to see the

information provided by the scanner and apply it to serve different customers may result in knowledge transfer from the scanner to the employee. This transfer could allow the employee to determine the best fitting pants for a customer by applying what he has learned from the scanner but without necessarily needing to use the body scan to help customers in every service encounter.

The scanner was also associated with creating a fun experience for the employee, which may distinguish it from other technology-assisted hybrid technologies designed to make interactions faster and easier, but not necessarily enjoyable (point-of-sale, bar code reader). As they learn to process and interpret the measurement and fit information provided while using the body scanner, retail employees might be prepared for future job roles outside of store management as fit experts inside the retail store or as fit technicians at a retailer's corporate office. The body scanner could train employees to be better at providing fit information as part of customer service and also to develop employees for future, more senior-level positions such as fit expert or technician.

Of the three technologies studied here, the technology-mediated interface, represented by the product configurator, had the lowest means for usefulness and behavioral intention than the other two technologies (see Table 5.1), which may reflect the lack of existing job tasks that require apparel retail employees to help customers design clothing. Open-ended responses showed that employees strongly associated the product configurator with customer service and many indicated that it would result in more personal interaction with customers. The product configurator, and other forms of technology-mediated interfaces with strategic opportunities not yet realized,

can then be considered useful tools for training apparel retail employees to provide better service through increased customer contact. These technologies can help retail employees develop more understanding of customer needs or even how to develop a rapport with customers around a store's products.

Technology-mediated formats might also help strengthen service orientation among retail employees because of the more personal contact these formats support. In this study service orientation did not inflence the dependent variables of usefulness and behavioral intention, but using this type of technology (actual use) might influence employee attitudes towards customers. Using the product configurator with customers may also be a development activity if the retail employee aspired to a design-related position in the future.

The product configurator would allow the employee to gain experience manipulating styles, to view information about product design features and develop insight into customer design preferences -- allowing retailers to possibly recruit designers from their own retail stores as in the case of Zara. This type of development opportunity could also encourage entry-level employees, perhaps similar to the sample of merchandising students in Knight et al.'s study (2006), to remain in store jobs in order to move into other positions they may find more appealing than store management (i.e. design or product development).

Social networking, the technology-facilitated interface, was found to be more useful with higher job roles in *Specialty stores*, which may suggest its development potential is best applied to retail management-level employees working in stores selling one product category. Social networking and other

technology-facilitated interfaces that support direct communication with customers may serve as training tools that can help managers learn how to more effectively handle communicating with customers outside of the physical store space (virtual communication).

Managers are often held accountable for the performance of their stores and that performance is often linked to sales and service. A manager who can increase sales by effectively communicating with customers will ultimately be successful. Social networking and similar technology-facilitated interfaces may help develop sales associates for future management positions. These technologies could provide experiences that allow employees to monitor changes in customer needs and make necessary adjustments within their store and/or assume responsibility for store communication with local customers using social networking or a similar information gathering software. Comments from open-ended responses also described how using social networking could help in merchandising or forecasting clothing styles by tracking customer feedback. Job tasks that include merchandise planning or trend forecasting are typically associated with people who work as merchandise buyers at a retailer's home office. Having knowledge and experience in these areas could prepare store employees for future jobs outside of store management such as buyers or trend forecasters at the retail corporate level. A conceptual model showing these possible career paths supported by using the technologies examined in this study is presented in Figure 5.6.

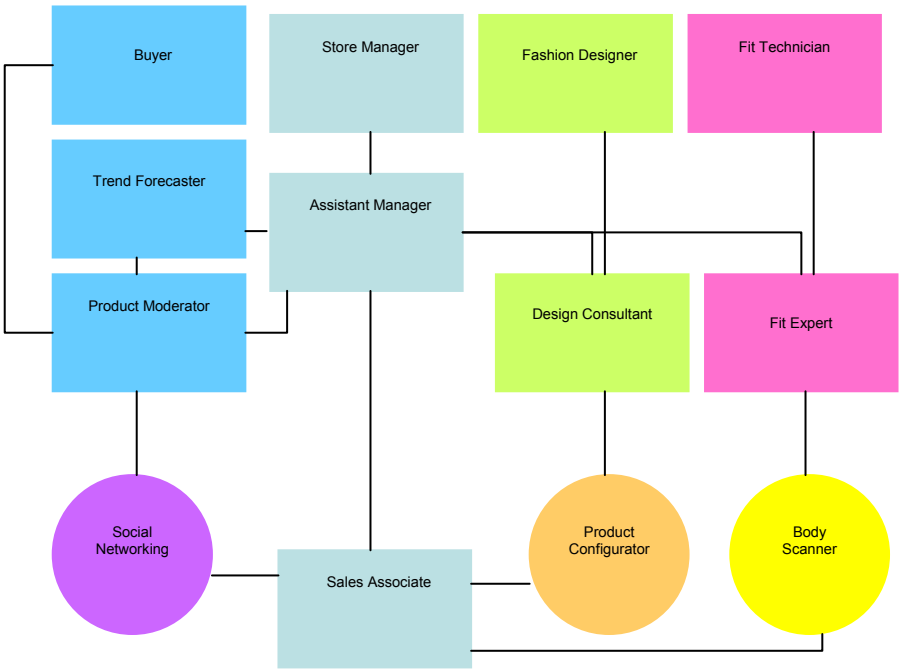


**Figure 5.6. Alternative Career Paths**

The three technologies examined in this study were single examples of different technology interfaces that could be used to support employees in customer service tasks and career development activities. However, other technology types may also be classified as technology-assisted, technology-mediated or technology-facilitated and also provide similar support. For example, the virtual world of Second Life is a technology mediated interface similar to social networking since the computer is the only medium for communication between users. This virtual world allows for interaction and visualization like social networking sites and may also support the same benefits of interaction (learning, communication, personalized service) associated with social networking in this study. Other technology-facilitated interfaces that allow retail employees and customers to visualize and discuss product features, like Microsoft Surface's touch-activated digital platform, may

help provide employees with experiences useful for future job roles that would require product knowledge and customer intimacy such as forecasting or merchandise buying.

Other technology-assisted formats may help improve customer service by increasing efficiency and accuracy in employee job tasks as described for the body scanner in this study. For example traditional fitting rooms that are replaced with virtual fitting rooms equipped with interactive digital mirrors would allow customers to browse for items on the screen without taking merchandise from the sales floor into the fitting room, reducing the time spent by retail employees for cleaning and re-arranging the store. From a master computer networked to all the fitting rooms, retail employees might be able to manage several fitting rooms at once by observing selections made by customers and instantly checking for the availability of items from the store's inventory list without having to physically leave the fitting area. The imagined benefits of efficiency and accuracy associated with the body scanner in this study might serve to improve both customer and employee satisfaction.

**Limitations**

While this study provided valuable results for how and why apparel retail employees may want to use advanced technologies in the store environment, there are some limitations to the study that may be addressed with future research. First, the majority of the sample consisted of part-time retail workers and almost half of the sample was not currently working in retail. Results showed that employees who were currently working had significantly higher service orientation and technology self-efficacy compared to those not working. A study involving a larger number of actively employed and full-time workers may provide different results or implications for the use of technology,

especially in terms of development since full-time workers may already be involved in career advancement activities. However, part-time and seasonal workers make up a significant portion of the retail workforce (US Department of Labor, 2008) as well so results of this study may accurately reflect the population in this regard.

This study did not take into account the previous years of apparel retail work experience for participants, which could also influence employees' perspectives and knowledge regarding the apparel retail industry overall as well as awareness of procedures and processes where technology might help with one's work or development. Finally, this study did not include a direct measure of employee job satisfaction, which may have allowed for direct comparisons with intent to use technology. Service orientation scores were also skewed for the study with most participants scoring very highly, but these ratings may not reflect the type of service these employees actually provide to customers. A future study that measures job satisfaction might also include usage of the technologies presented in this study and other technologies by both employees and customers in the context of user interactions suggested by Froehle and Roth (2004). This approach might capture useful job satisfaction and customer satisfaction ratings.

This study examined three hybrid interfaces and provides several examples of the benefits of using innovative technology for improved customer service and employee development purposes. The simultaneous benefit of improved customer service and employee growth/retention offered by these and other advanced hybrid technologies may provide an appealing combination for retailers searching for new strategies to compete and succeed in the current retail environment.

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# CHAPTER 6
# FASHIONED FOR THE FUTURE: TECHNOLOGY ENABLED EXPERIENCES IN THE CLOTHING STORE OF THE 21ST CENTURY

## Introduction

In 2002, as part of a new denim campaign, Express stores invited shoppers in large metropolitan areas like Los Angeles and Miami to engage in private shopping events, style makeover lounges and photo sessions in which the shopper could pose as a super model (Moin, 2002). The following year, young female customers were invited into store locations, designated as design studios, filled with marketing displays highlighting the individual designers who worked for the company along with detailed descriptions of the styles each of them helped create. Working sketches with technical notes along with photos of the designers at work in the studio were prominently featured throughout Express stores so that the customer had a sense of the quality behind each apparel style. Product information regarding fabric types, construction techniques and tailored garment features was given to the customer looking to build her first professional wardrobe.

As described in the Express example above, there is an allure of fantasy that can be associated with clothing and fashion in the apparel retail industry, as customers are encouraged to imagine themselves as supermodels or fashion insiders based on the retailer's engaging marketing expertise. In addition to advertisements, special events or store atmosphere, the apparel store employee is also an important part of marketing, and he or she is usually expected to represent the apparel brand by wearing the retailer's clothes and maintaining a certain appearance, as well as adhering to

company standards regarding customer service. Customer service includes a range of activities such as greeting customers, ringing up purchases, processing returns, opening new credit accounts, managing fitting rooms, locating items for customers, answering product-related questions (price, colors, sizes, etc.), arranging and stocking merchandise and preventing theft.

Apparel is a product that most people want to be able to feel or try on before making a purchase since there may be issues regarding quality or fit. According to Underhill (1999), clothing stores are prime locations for customers to engage in what he calls “touch and trial”. His research also showed that shopper conversion rates (number of people who buy compared to the number who enters the store) increased by 50% when a store employee initiated contact with a customer, and when the employee was also able to help the customer while using the dressing room, conversion rates were 100% (Underhill, 1999). While high conversion rates are a retailer’s constant goal, it can be challenging to achieve store employee contact with every customer who enters a store – usually because employees are busy with other tasks, choose not to assist a customer, or a customer indicates that he or she does not want to interact with the employee.

Technology can be embedded in the apparel retail store in order to give employees more opportunities to initiate contact with customers and to support many of their existing responsibilities and even make them more efficient. Technology could also be integrated into the apparel retail store in new applications. For example, it could serve as a tool to support a retailer’s marketing or branding efforts for engaging and informing customers, similar to the approaches used by Express. This study provided (1) an evaluation of the types of technology and interaction apparel retail contexts that were most

valuable in supporting employees for customer service and other existing job tasks and (2) analysis of how advanced technology could engage customers and employees in new ways. This evaluation may help determine the most suitable approaches for incorporating technology into the apparel store environment for maximum strategic value.

## Conceptual Framework

Baron, Harris and Harris (2001), discussed the idea of "Retail Theater" as a way to introduce newness into retailing for fun and excitement for the customer. Four theatrical movements described the roles of the customer in this new environment, along with corresponding employee responsibilities. The roles of the customer were *voyeur, spect-actor, sense-ceptor* and *connoisseur*. For *voyeurs*, merchandise is presented in a realistic setting and there is a distance between the actors (employees) and the audience (customer) with very little interaction between the two groups since employees are either busy getting products or being a character. *Spect-actor* customers are expected to know that they are in an environment where selling is taking place and they are able to critique the merchandise and its presentation. There is also high interaction of customers with employees as well as with other customers regarding product information. Employees working in the *spect-actor* setting were described as having non-traditional retail positions since they "are primarily facilitators of information exchange between customers rather than necessarily being experts in the field" (Baron et al., 2001, p,107). The *sense-ceptor* customer is expected to have physiological responses to in-store stimuli and this customer is presented with opportunities to physically interact with the product or experience simulations, while employees are both behind the scenes creating the experience and out front

helping the customer with interactions or simulations. The *connoisseur* customer is left to his or her own interpretations of the abstractly presented product with no assistance from employees, who serve as “human exhibits” or as movers of merchandise displays. The four customer movements, while highly engaging and informative for customers, were also presented as a means of transforming the retail employee (actor) toward enhanced job roles, training and reduction of “boredom costs” (Baron et al., 2001).

Store types that best captured the concept of retail as theater were themed flagship brand stores. Kozinets, Sherry, DeBerry-Spence,Duhachek, Nuttavuthisit and Storm (2002), described these stores as places where consumers go to both purchase a retailer’s branded products and to engage in an entertaining experience. The goal of these stores was primarily to build the company’s brand image, and examples included flagship stores for apparel retailers like Levi’s and Nike (Niketown) where customers were able to create custom products or use interactive displays (Solomon & Rabolt, 2004; Penaloza, 1999). Kozinets et al. (2002) also predicted that these stores would most successfully capture the in-store and online shopping experience for customers in what they call “brick-and-click hybrids” and become the future model of retail stores (Kozinets et al., 2002):

> Through the use of lavish décor, sleek finishes, and attention to the smallest of details, consumers are presented with a stage behind the storefront. Interactive displays and other engaging edifices evoke emotions and other sensations that make an experience unique and individual. For the retailer, successful brand building comes in the form of consumer experiences that entice, entrance and enrapture. (p.20)

This prediction regarding retail’s future model corresponded to a larger shift in the manner in which service would be provided in many industries according to Pine and Gilmore (1999) in what they called the *Experience Economy*. The *Experience Economy* described a shift occurring in developed nations from

economies based on providing services to those based on providing experiences. This shift has moved these countries from economies based on commodities, to those based on goods, to services and ultimately to experiences. Agrarian societies focused on the production or extraction of commodities, which are sold in their natural state (crops, animals, minerals). Commodities provided the raw materials for goods, which became associated with the first Industrial Revolution when manufacturing served to convert raw materials into finished goods in mass quantities. The service economy was dominated by the use of goods (e.g.clothing) to perform an activity for a customer (e.g. design), that included customization to his or her requests. The introduction of automation in the service economy (similar to automation for production of goods) with technologies like self-serve checkouts was an indicator to Pine and Gilmore (1999) that the service economy sector had peaked and was giving way to experiences. An *Experience Economy* uses goods as props and services as a stage to engage customers in memorable experiences. They described work in this economy as follows:

> In the emerging Experience Economy, any work observed directly by a customer must be recognized as an act of theatre. Indeed flight attendants and hotel staff routinely perform acts of theatre when they direct patrons to the nearest exit or rented room. The work of a retail store associate is theatre when he straightens merchandise on a shelf…All this work is theatre, even when the audience isn't paying customers, because internal acts make impressions on customers who do not pay. In the Experience Economy, businesses must figure out how to make work, whether performed on stage or off, more engaging. (p. 106-107).

Silverstein and Fiske (2003) described examples of companies that have successfully used experiences to transform conventional goods like coffee, bread and underwear, so that customers willingly paid more for these products and the experiences they provided, a concept known as *New Luxury*.

For each of these examples, Silverstein and Fiske (2003) revealed how company leaders sought to re-create the *European* experience for their consumers in the form of an Italian coffee house or bakery (*Starbucks* and *Panera*) or a French lingerie boutique (*Victoria's Secret*). Interestingly, for the food retailers mentioned here, customers were also able to customize products as part of the experience, which according to Pine and Gilmore (1999) was a key activity for entry into the *Experience Economy*.

Retailers like *Lands' End* and *Levi's* implemented mass customization options for jeans and khakis using online product configurators that allowed users to select options from a limited number of features. However, these customization capabilities had not yet propelled an apparel retailer to a leading position within the apparel industry. Perhaps it would take the initiative of apparel retailers that were already leaders in staging customer experiences (like *Victoria's Secret* or *Nike*) to successfully demonstrate how mass customization could help apparel retailers fully engage in the *Experience Economy*.

***Mass Customization Experience: The Case of Nike***. An interview with the Advanced Imaging Manager of Nike's Apparel Innovation team, Joshua Young (personal communication, October 2008), offered further insight into the introduction and use of technology in the apparel retail store environment from the perspective of a company already known for its ability to create customer experiences in its stores. Niketown stores were classified as themed flagship brand stores (Kozinets et al., 2002) where customers could not only purchase Nike shoes and apparel but also engage in entertaining experiences that reinforced Nike's brand image. The brand image at Niketown and the experiences used to reinforce it were considered so unique to retail

stores that researchers have conducted ethnographic studies of Niketown locations to evaluate a retail space that has been considered museum, theater and playground where customers can view sports memorabilia or try out a pair of Nike shoes on the in-store basketball court (Sherry, 1998; Penaloza, 1999). In 2007, with the introduction of NIKEiD in its New York City flagship store, Nike added another experience to its store environment -- mass customization. The Nike customer was now able to interact with employees known as design consultants as they proceeded through the 45-minute customization process to create their own footwear or apparel (PR Newswire, 2007). This transfer of Nike's online customization software to the physical store space represented a shift to *the brick-and-clicks hybrid* format predicted to become the future retail store model (Kozinets et al., 2002).

The future for many apparel retailers could mean adopting Nike's existing model of providing in-store customization of their products in order to remain competitive. As an industry leader in providing experiences, Nike was already looking ahead to increasing in-store innovation for its customers. According to manager Joshua Young, Nike's customization program was definitely a competitive advantage for the company and had made Nike a leader in the wearable goods industry (J.Young, personal communication, Ocotber 2008). He described NIKEiD as one of the most sophisticated programs for customizing footwear at the retail store level and expected Nike to maintain that lead while also being able to strategically advance in terms of other customization possibilities, such as moving from footwear into clothing customization, adding capabilities that allowed for personalized fit for the customer (instead of using only Nike's specification measurements) and producing customized items in-store (J.Young, personal communication,

October 2008). At the time of the interview, NIKEiD allowed customers to receive help from a consultant as they designed footwear and at the end of the design session, customesr received a print out of their customized shoe and waited about four weeks for the shoe to be manufactured and delivered to their home. However, with apparel manager Joshua Young envisioned other possibilities inside the retail store enabled by apparel technologies that would support finding the perfect fit and visualizing that fit on a virtual image:

> We have been thinking of this not only in terms of just e-commerce because that was definitely our original focus but now we are also seeing this as having huge potential also for brick-and-mortar. So, the idea that the consumer would be able to electronically or digitally fit themselves with the entire Nike line, that is the first step and then as the next step we've been thinking how we can leverage this same tool once we have the consumer excited about this ability to try on clothes electronically and then take it all the way to customization…I think if then we start throwing in customization into that equation, perhaps even on site customization where instead of having to wait 4 weeks, especially for things like t-shirts, you can have things literally immediately on-site. I think that starts to add a huge amount of value to the customer, especially customers who are looking at that sort of mass customization where you're getting the consumer exactly what they want where they live (J.Young, personal communication, Ocotber 2008).

Traditional apparel production has favored methods of mass production that allowed for economies of scale and competition among retailers who could most efficiently manage their production process to provide the most items to customers in the least amount of time at the best price. Nike's move to in-store customization of clothing, especially in terms of fit, was definitely a challenge to a production system based on volume and minimal choices. Even the NIKEiD customization process for footwear had some limits for the choices available to consumers in terms of selecting colors and shoe styles and used standard shoe sizing for fit. For Joshua, the future of Nike customization was described as follows:

> A retail setting where you can go and not just get a garment, not just find out what garment that Nike has available that fits you but take a Nike garment and see it visibly customized to your own body dimensions, and perhaps even as an extension of that Allow you to even customize it further for your own personal tastes. So if you wanted to have it a little thinner around the waist or a little wider in the shoulders and so forth, and produce a truly customized fit for the garment that you're going to buy that is in your own personal taste. I think reAlly that is the pinnacle of what consumers would want, I know for a lot of people the fit of the garment is one of the most important things and I think that's really where the long-term of the industry should be heading, at least that's my opinion (J. Young, personal communication, October 2008).

He argued that the manufacturing capabilities, in terms of equipment and technology (like body scanners, virtual fit software and laser cutting), already existed in the marketplace to handle such personalized mass customization but that adoption by manufacturers was not widespread due to traditional views and systems within the apparel industry favoring mass production. Mass customization typically required smaller production quantities and more frequent changes in equipment to accommodate differentiation in styles than what was required for mass production. So manufacturers accustomed to large production runs with few or no changes in their production lines might not easily see the benefit of interrupting or dedicating some of those lines for mass customized products. Joshua was convinced that an increased awareness of the technologies and equipment available for mass customization, along with an understanding of how to use them could result in manufacturing facilities capable of supporting the needs of large retailers like Nike.

Customers may already expect some degree of *experience* when they go shopping for clothing (Kim, Sullivan & Forney, 2007) and this may include the ability to customize products (Burke, 2002). Wood (2002) found that shoppers had clear concepts of what stores should be like in the 21$^{st}$ century,

including descriptions of improvements in convenience, customization of products and the use of technology within the store. For apparel stores, customers imagined the integrated use of virtual communication, body scanning, databases and co-creation/customization as all a part of the shopping experience (Wood, 2002).

Interest in technologically integrated store formats may reflect consumers' current levels of technology use. In her research on technology usage specific to the apparel industry, Fiore (2008) defined different apparel customer roles for what she called the *digital consumer*. One role was the *digital content creator* who generated content pertaining to products and brands by using technology. This customer primarily used blogs, unauthorized websites and social networking sites. The *digital personalized product creator* was someone who created images of products with digital technology that supported mass customization or customer-made capabilities, allowing the user to design and/or manipulate product options and combinations. The *digital experience seeker* was looking for an enjoyable and engaging shopping experience, likely using the same technology formats as the *personalized product creator*. For all digital consumers described by Fiore (2008), computers became a medium for self-expression and creativity and may provide insight into how apparel retailers could create in-store experiences that engaged these apparel consumers. Koontz and Gibson (2002) described how retail clothing stores might begin to integrate experiences for in-store and virtual customers in what they call *mixed reality merchandising* which was "a way for certain retailers to combine their on-line and physical store efforts for maximum benefit for both the retailer and the shopper" (p.382).

Retail theater suggested that not only customers (the audience) would

have engaging experiences but that the actors, retail employees, would also take on new, improved job roles in this environment as they displayed products or moderated customer interactions (Baron et al., 2001). Another possible job area for retail employees was in the area of product development (Judson, Schoenbachler, Gordon, Ridnour, & Weilbaker, 2006). According to Judson et al. (2006) sales personnel had an advantage in providing information that could help with the development of new products since they were in direct contact with the customer. Retail sales associates as consultants in clothing stores was an enhanced job role conceptualized by Khakzar, Blum, Kohlhammer, Fuhrmann, Maier and Maier (2007) in order to test a new technology support system involving use of 3D body imaging and virtual try-on of clothing. Responses to the system showed that employees thought it enhanced interaction with customers, and customers reported satisfaction with the service and also having fun using the system. Technology-mediated interfaces like these between service providers and customers are an opportunity for retail theater in the *Experience Economy* (Pine & Gilmore, 1999) and serve as a "bare stage for business theatre" (p.106) where companies can distinguish themselves from competitors' products and services.

Froehle and Roth (2004) conceptualized human-computer interaction among both employees and customers in service situations and described five modes of interactions. The modes of customer contact were further organized into "face-to-face" and "face-to-screen" contact. Face-to-face contact involved interpersonal contact between the customer and a service representative including:

- **technology-free** mode (no use of technology during service encounter)
- **technology-assisted** mode (technology aids the service representative to improve customer interaction)
- **technology-facilitated** customer contact mode (service representative and customer both use technology to enhance the interaction).

In face-to-screen contact modes, technology was the only point of contact, including:

- **technology-mediated** mode (technology is used as the only means of interaction between customer and service representative)
- **technology-generated** customer contact mode (technology substitutes for service representative)

Froehle (2006) also studied how service representatives influenced customer satisfaction in the technology-mediated mode by measuring consumer satisfaction after a service encounter with an employee during which technologies such as online chat and email were used. Results indicated that personal characteristics of the employee related to thoroughness, knowledge and preparedness positively influenced customer satisfaction regardless of the type of technology used by the employee to support the service encounter. This finding illustrated how technology could be used as part of an employee's work but that the technology itself could not substitute for the relationship between customers and those providing customer service. Customers may not have perceived how technology supported the work done by employees making the hybrid interface almost undetectable for them. However, self-report

evaluations completed by employees may have revealed how useful they thought technology was for interacting with customers.

The importance of customer and sales associate relationships was examined by Beatty, Mayer, Coleman, Reynolds and Lee (1996) in an effort to understand the process of relationship selling in an apparel store chain. Relationship selling referred to “ongoing one-on-one customer-sales associate relationships” which the researchers distinguished from relationship marketing, a form of marketing that targets groups of customers for specific campaigns and uses methods such as promotional mailings or database marketing (Beatty et al., 1996). The study focused on sales associates who used the telephone to maintain ongoing relationships with customers. In accordance with company policy, the sales associates kept a log of information on each customer, including preferences for colors and sizes as well as notes on birthdays and names of family members, so that they were able to call customers when merchandise matching their preferences arrived in the store or to cater to other customer needs like personal shopping or delivery. Similar to findings by Froehle (2006), the researchers found that customers they interviewed valued the skill and knowledge of the sales associate as part of the service encounter. Additionally, they found that sales associates received benefits from the relationship as well:

> The outcomes of relationships can be viewed from both the customer side and employee side, but they also tended to reinforce one another in our study. That is, as the customer becomes pleased with and committed to a relationship, this increases the pleasure felt by the employee as well. Further, it is these positive outcomes that feed back to produce employees more committed than ever to customer service and relationship formation, while customers become more committed to the relationship and perhaps, seek other similar relationships in the retailing or service sectors (p.237).

New technologies have been developed for use within the apparel industry and may be a possible means of facilitating or supporting employee-customer interactions that can develop into relationships capable of transforming services into experiences. The purpose of this study was to evaluate these technologies from the perspective of apparel retail employees and whether or not they also perceived these technologies as possibly supporting customer relationships, experiences and corresponding new job roles. Open-ended questions were used to collect data on technology at work from retail employees.

## Method

### Technologies

Three technologies-- body scanner, product configurator and social networking--were selected for this study to represent recent advances in technology that were specifically adapted to the apparel retail store environment. These technologies were not yet widely used across the retail industry so much of their value in the store environment had not been evaluated by employees, and they also represented different hybrid interface formats (see Figure 1) for human-computer interaction by employees and customers (Froehle & Roth, 2004). A discussion of the three technologies, their current use and benefits as hybrid technology interfaces in apparel retail stores follows.

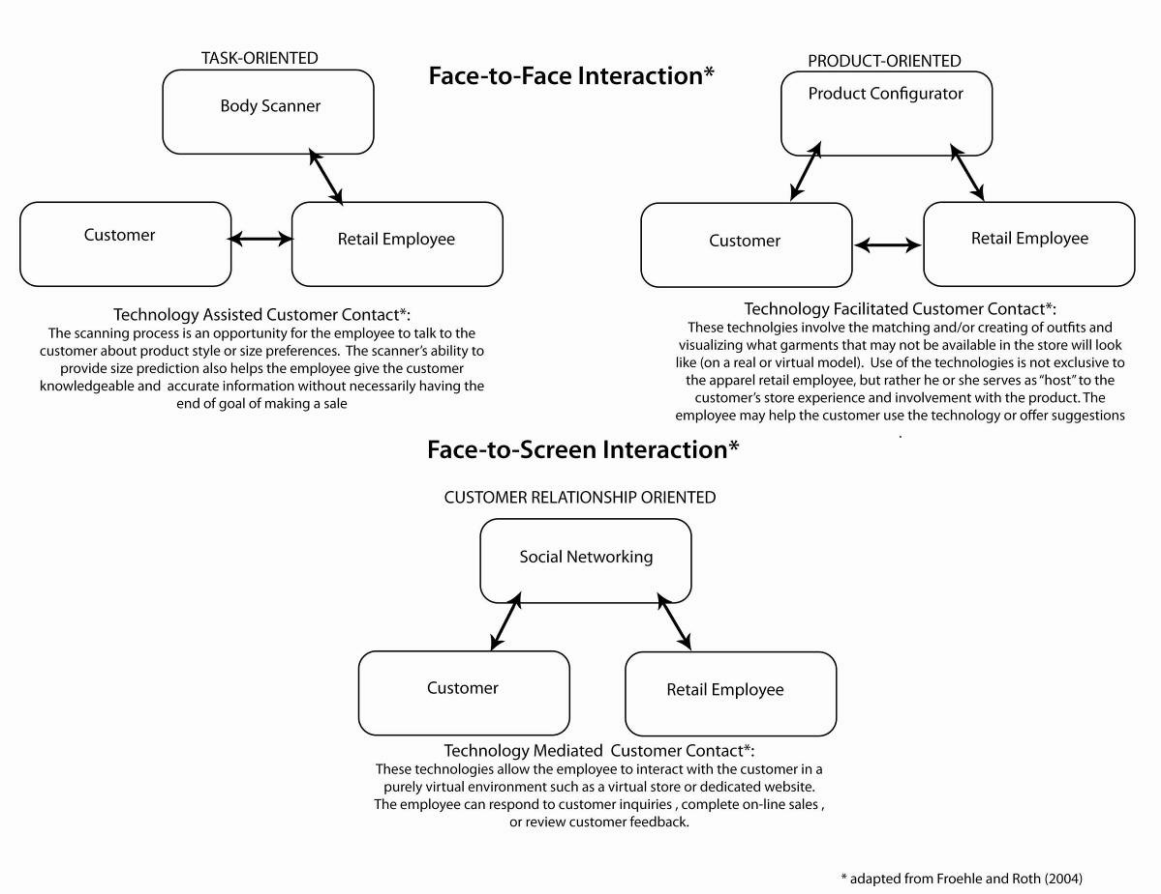


**Figure 6.1. Human Computer Interaction for Body Scanner, Product Configurator and Social Networking** (adapted from Froehle & Roth, 2004, p. 3)

*Body Scanner*. The scanner provides useful information to apparel retail employees regarding which store products most likely provide the best fit for the customer. By using what is termed *size selection*, the body scanner is able to compare the customer's individual body measurements with the retailer's clothing specification measurements in order to suggest sizes and styles that will result in the best fit. The body scanning process involves having the customer enter an enclosed booth where white light, lasers or radio waves are used to establish the shape of the body by capturing thousands of data points. Software designed for use with the scanner translates the data points into body measurements important to good fit and then compares these measurements with those used by the retailer and finally recommends the best styles and sizes for the customer based on this information. The scanning process is considered a technology-assisted format since only the employee actively uses the technology to support the task of finding the right size and style for the customer.

*Product Configurator*. The product configurator is an electronic tool where computer software enables a user to customize apparel by style or color, or any other design feature the retailer chooses to offer, and view the changes virtually. This technology has largely been used by small niche apparel businesses and by sportswear retailers like Nike and Adidas for producing mass customized footwear. The configurators are usually web-based for use by on-line shoppers (technology-generated customer contact) but they are beginning to appear in stores as well, adding another potential point of contact for the customer. Nike was one of the first companies to offer an online mass customization tool for its footwear in 1999 with NIKEiD, and in

2007 the company introduced the NIKEiD studio in the company's New York City Niketown flagship store. The configurator may provide and opportunity for both the employee and the customer to creatively interact around the product as a *technology-facilitated* service interface (technology used by the employee and customer together) and has the potential for establishing new job roles for retail employees (similar to Nike's design consultants) as well as supporting the desired in-store experience of customers for customization and technology use (Burke, 2002; Wood, 2002; Fiore, 2008).

*Social Networking*. Social networking is a web-based technology that allows subscribers to communicate with others in a specific group, the same geographic area or network of acquaintances. It is the technology used for web-based services like Facebook, MySpace and Second Life. JC Penney launched its own online community in 2008 to gather customer responses to the fit and quality of its new products, asking customers to create profiles, participate in discussion boards, and contribute to online chats with the JC Penney product team (Passenger, 2008). Social networking was also the conceptual foundation for a new in-store technology developed by digital agency Icon Nicholson, called *Social Retailing*, that was tested and introduced in retail stores in 2007 and allowed customers to connect to a network of acquaintances via email or instant messaging in order to get real-time feedback from this network on styles that were at that moment being tried on in the store (IconNicholson, n.d.). Social networking is a *technology-mediated* interface (technology is the only point of contact for employees and customers). This format may be a means of developing new job roles for employees in product development (Judson et al., 2006) as design or product *moderators* gathering information, as in the case if JC Penney, or observing

customer comments around the product as with Social Retailing.

**Sample**

Apparel retail store employees and former employees with work experience in an apparel store, were recruited for the study in order to assume a base level of experience for evaluating each of the technologies in the context of retail job tasks and customer service. A large mall in central New York was the first site selected for data collection since retail employees would have access to the technologies and sufficient time to complete the study and a laboratory space was used as a second site. Participants were recruited for the mall study using flyers distributed by the main mall office one week in advance of the start of the study either during a break or after work. The flyers described the study, the types of technology and an incentive of a raffle for one of three $50 giftcards and a $5 giftcard for a local restaurant for those who completed the study.

For the second study site, participants were recruited via a local university's email listservs, the research recruitment website of the university's psychology department, Craigslist and through visits to local retail stores, and all were offered a $20 incentive to complete the study. This incentive was offered due to travel distance to the laboratory space, the amount of time participants would spend completing the study, and the difficulty in attracting participants at the first site. In emails and web advertisements, participants were advised that work experience in a clothing store was required for participation.

Each site was set up with a body scanner and two laptop computers. The body scanner consisted of twelve white light sensors inside a 10' x 5' booth and was operated by a desktop computer loaded with software capable

of producing an image of the scanned person and extracting measurements. One laptop was used for the product configurator and the other for social networking. Participants were able to select prints and style features for three children's garments (shirt, overalls, and jacket) using the product configurator. The social networking site consisted of a computer message board and customer profiles for both men's and women's clothing that participants could navigate as if they would be contacting a customer regarding a store's products. Although both of these technologies were web-based and interactive, for this study the technologies were formatted so that participants did not require internet connectivity for use – this was done to limit the effects of interactivity or possible problems with consistent internet connectivity among different participants.

Participants were provided with a description and demonstration of how each technology worked by the researcher and then instructed to use the technology independently. The description and demonstration were done to allow the researcher to assume that all participants had a basic level of understanding of the technologies and their retail applications. After using a technology, participants were asked to complete a questionnaire consisting of five open-ended questions. These questions were created as part of a larger study using quantitative data and analysis that were reported in chapters four and five. These questions were developed in order to probe participants' reactions to technology and how they felt each technology would change their work experience. The following questions were used:

*(1) How would you imagine this technology helping you do your job better?*

*(2) How would using this technology make your job more interesting?*

*(3) How would using this technology change the way you work with customers?*

*(4) If you could make the decision to adopt this type of technology, why would or wouldn't you put this technology in your store?*

*(5) Any other comments about the relevance of this technology to your job?*

After answering all questions for the first technology, participants were then directed to the second and third technologies to complete the same process. After using the last technology, participants were also asked to complete a brief set of demographic questions, including interest in new job roles as a *fit expert* and a *design consultant*.

## Results and Discussion

### Sample Description

A total of 71 participants completed the study between the two sites – 10 at the mall site and 61 at the laboratory site. The sample included 56 females (78.1%) and 15 males (21.1%). Ages of participants ranged from 16 to 66 years old with the majority of the sample between the ages of 16 to 21 (59.2%). Most of the participants had received some post-secondary education with 39 participants (54.4%) reporting some college education (included students currently enrolled). Most of the sample worked part-time (73%) and there were 41 participants (57.8%) who were currently working in a retail store with 18 employed as a sales associate (25.4%) and 23 as store managers (32.4%). Those working in stores with one product category, which could include men's, women's or children's clothing were placed into a group called Specialty (51%, $n$ = 32), and those working in stores with more than one product category were placed into a group called All products (48%, $n$ = 34). There were 30 participants (42.3%) with apparel retail work experience who

were not currently working in a retail store.

The mean score for interest in new job roles was 3.4 (*SD* =1.4) for design consultant and 3.2 (*SD* = 1.4) for fit expert, both were based on a 1 to 5 Likert-type scale where *1 = No Interest* and *5 = Very Interested* in the job role. Mean comparisons of interest in these new job roles using demographic information did not show any significant differences for the sample based on age, gender, education, store type or current job position. The overall sample mean scores were above the scales' neutral mid-point (3) and suggested a positive interest in these job roles by employees.

**Responses**

Open-ended questions were transcribed from the questionnaire for each subject by technology type. The researcher did not develop any preconceived expectations regarding findings for the five questions, so all questions were reviewed for key terms that were found in the responses. Once terms were identified they were listed and compared for redundancy. Similar terms were combined and the responses were reviewed a second time to verify the assignment of relevant terms to responses. For example, broader themes like *service* accounted for responses that contained terms like "it would help me help the customer…," indicating that the participant thought of the technology in terms of customer service. Responses also contained words like "quickly" or "not waste time" that were placed under the theme of *efficiency*. Once terms were assigned, they were then coded for frequency of occurrence and the data were examined for emerging themes. Themes were divided into *within technology* and *between technology* categories. *Within technology* themes represented unique characteristics that participants only attributed to one technology and *between technology* themes represented

common characteristics found across all three technologies. Themes were compared using transcripts for each set of questions by technology type to determine within technology themes. Then all three sets of transcripts were compared to determine between technology themes. Participants' comments were predominantly positive towards the technologies, but there were some negative remarks towards the technologies that mainly pertained to how a technology did not relate to the participant's current job tasks, how a technology was not appropriate for a certain store type or size, how expensive a technology would be for a store, and for social networking, how customer privacy would be protected. Negative comments helped inform some of the limitations of the technologies and areas where more employees might need more education regarding the use of technologies in relation to their jobs. However, positive comments were the focus of this study since they helped determine the features that employees found most useful for customer interaction and other job tasks as well as identified possible future applications of the technologies.

**Within Technologies**

*Body Scanner*. The body scanner was viewed as able to make employee jobs better by providing accurate fit information that the employee could use to inform customers instead of having to use a best guess of a customer's size or customer's self report. Because participants would have this type of information and technology to use, they also indicated that customers would have more confidence in employee recommendations regarding fit and sizing. Using the body scanner was viewed as changing the way employees worked with customers by reducing the intrusive nature of taking customer measurements with a tape measure. The scanner would also

make jobs better by reducing the need for customers to try on clothing in a fitting room which could expedite the selling process and require less clean up by employees. The scanner was also seen as a way to make employee jobs more interesting by allowing them to view body scan images and measurement information. It was also described as able to reduce the monotony of the job.

> It would provide an additional activity to break up shifts and it would be interesting to see the customers' reactions (Subject #57).
>
> It would provide a more accurate read of what size customers are, they may feel more trusting of your advice offered vs. normal measuring system (Subject #55).

The body scanner could change how employees initiate contact with customers and could serve as a useful prop for retail theater. Employees could use the experience of providing a body scan as a way to begin a conversation with customers about sizes or which of the store's products will fit best. Employees also expressed reasons why the body scanner would not be appropriate for their stores. Reasons included the physical size of the scanner, costs associated with purchasing a scanner, how scan images could negatively influence a customer's body image and the distraction of using the scanner for fun instead of work

> I wouldn't want it simply because it may make the shopping experience space. However, it is a beneficial technology that can help consumers find the perfect garments for themselves and ensure that they have made the best possible choices (Subject #27).
>
> I wouldn't chose to put this in my store because it is such a small store and we have very little inventory that it would be more of a hassle for us

than anything (Subject #34).

*Product Configurator*. This technology was seen as way to make employee jobs better and more interesting by adding creativity and design to one's job. It was also important as a tool to help employees understand how clothing items could be coordinated and help them make better recommendations to customers. The product configurator was also a way to create a more personalized shopping experience for customers through engagement and interaction in a design and customization process:

> It would make the job even more intimate than it already is, which is a great way to truly build loyal consumers. It would make each interaction very personalized (Subject #27)
>
> It would allow us to find a style the customer would really enjoy and feels suits them best, which makes it easier on the employee (happy customer) and provides a more satisfactory experience. I would be able to provide them with more options than usual to personalize the experience (Subject #45).

The product configurator was also seen as a more valuable means of getting customer information about preferences than just talking with the customer. Employees also indicated different reasons for not adopting the product configurator in their stores. Some employees noted that the technology did not match the services and products available in their store, particularly if their store did not sell children's clothing. Also, employees noted that the time needed to make and deliver customized clothing items would be too long and not appealing to customers.

> I wouldn't just because we don't have kids but also we don't customize clothes (Subject #22).

> I wouldn't because it would take time for the customized product to arrive and I don't believe our customers would be willing to wait. They are often frustrated if we have to special order something (Subject #38).
>
> I wouldn't put it in because it seems like it would take a long time to get the physical product after you have selected what you want. Also, people don't go into a store to work with a computer. They can do that online (Subject #67).

The functionality of the product configurator software was also perceived as a negative by some employees who wanted the technology to have more interactive features.

> Would be useful to be able to change location and scale of pattern on garment front and back. Also it would be good to mix and match elements or move element around at will. Also I would imagine customers would like to personalize with name or other logos. Download feature would be good (Subject #42).

*Social Networking*. The features of social networking were viewed as able to make employees' jobs better by allowing them to alert customers of special promotions or items. Job improvement was also connected to being able to get feedback on customer service and store products from customers. Social networking was also seen as a way to improve jobs by educating employees about customer preferences or providing them with information that would allow them to compare customer data and use that information in future service encounters.

> It would help me pay more attention to similarities between certain types of customers and what they like. I could use this knowledge to

help future customers (Subject #37).

It could help me become more familiar with the products as well as give me prompts and examples for interacting with in-store customers (Subject #40).

Customers should be able to upload pictures/items of clothes that they have at home to match outfits together (Subject #7).

Social networking was also perceived as a valuable tool for allowing employees to make merchandising decisions because of its feedback capacity -- employees could evaluate what types of items customers preferred and change the store to highlight those items or request additional inventory. A unique way that social networking was seen as changing the way employees work with customers was increasing the employee's confidence in providing customer service.

Social networking would help when it comes to deciding what clothes to put on the floor for the new season in terms of the preferences of the customers (Subject #68).

I would probably get a better sense of what is in demand/decline and how people feel about the products, and using this I could more easily interact with customers (Subject #51).

The ability to use social networking as a tool to contact customers for information or to convey promotional/ marketing information was also viewed as a negative feature of the technology by some participants. Participants noted that these features could be perceived as intrusive or as a form of *spamming* (electronic junk mail). It was also noted that employees would use social networking but with some reservations since it could be cost prohibitive and also take time away from other job tasks.

> Again this would depend on its price point. I see it as another form of spam and would not want to irritate my customer base, but at the same time it would be a good advertising tool (Subject #59).
>
> I would but it would be difficult to find time to really use it consistently without adding a lot more hours to our payroll since it's not something we could really do on the sales floor (Subject #17).

**Between Technologies**

There were nine themes that emerged based on responses across all three technologies that were attributed to at least two of the technologies. The themes found among three technologies were: *service, efficiency, customer relationship, fun*, *making the job easier and increased sales*. Themes among two of the technologies were: *more personal, customer knowledge* and p*ositive customer reaction* (see Table 6.1).

*Service.* Service was identified as a theme among all three technologies and included responses for which participants indicated that a technology would help them help a customer in some capacity. Better customer service as a result of providing fit information and accuracy of the information were mentioned as ways of improving the employee's job. Service was also mentioned for the product configurator in terms of making employee jobs better, particularly as it related to allowing employees to satisfy customers by allowing the customer to create a product to meet their (customer) needs.

> I've had a lot of comments like 'if it didn't have those buttons' or 'does this come in a different color?' If I were to create specific pieces my customers would be more satisfied (Subject #18).

Customer service was identified as a way social networking would change the

way participants worked with customers by providing employees with additional information that would allow them to better assist customers.

> I think it [social networking] would make me a more effective saleswoman. I could make more informed suggestions, thereby giving the customer a better shopping experience (Subject #32).

**Table 6.1. Between Technology Themes**

| THEMES | TECHNOLOGY TYPE | | |
|---|---|---|---|
| | **Body Scanner** | **Product Configurator** | **Social Networking** |
| Service | X | X | X |
| Efficiency | X | X | X |
| Relationship | X | X | X |
| Fun | X | X | X |
| Job Easier | X | X | X |
| Increase Sales | X | X | X |
| Personal | | X | X |
| Customer Knowledge | | X | X |
| Positive Customer Reaction | X | X | |

*Efficiency.* Participants felt that all three technologies provided time-saving benefits. Efficiency was identified as reason employees would adopt social networking for their stores since it was seen as an efficient tool for quickly contacting customers or making them aware of new marketing, as well as a means of getting up-to-date sales and trend information for store products. The product configurator would make employee jobs better by allowing them to quickly visualize clothing options for customers or to place an order for customized clothing.

> Rather than piles of clothes in dressing rooms, the customer could visualize their options on a computer screen (Subject #47).
>
> If this technology were available, I believe it would allow me to quickly customize apparel and shoes for my customers (Subject #65).

The body scanner was primarily seen as a tool to help employees quickly find items for customers that were the proper fit or size.

> At my job we are constantly measuring people's bra measurements so this would let the scanner do it quicker and more accurate (Subject #17).
>
> More efficient, better size selection and service for customer. Be able to efficiently offer more selection in the correct size for customer. Easier to find jeans – usually quite difficult (Subject #35).

Specific applications within apparel retail stores for these technologies may be the use of body scanners in stores with high customer traffic since this technology can reduce the time needed by employees to find the right size of an item. The product configurator may help reduce customer time looking for an item as well since items could be customized by working with a store employee, or this technology may be a way to satisfy customers who are *digital personalized product creators* (Fiore 2008) since they would have the ability to customize or create within the store.

*Customer relationship.* Participants indicated that all three of the technologies would make the customer and employee relationship better and closer in some way. For the product configurator, participants thought the ability to establish or build a relationship with customers would make their jobs more interesting. Having relationships with customers that were closer and more personal were how both the product configurator and social networking

would change the way participants worked with customers.

> It [product configurator] would probably promote employee/customer communication, because assuming training was necessary to use DigiKids, the customer would have to interact with salesperson to help them create their custom garment (Subject #33)

The body scanner was seen as a way of changing the way participants worked with customers by increasing employee and customer interaction through the one-on-one scanning process.

> It could be more interactive – a joint experience with employee where they (customer) feel the store is attuned to their needs – a plus. Experience/interaction would make customer perhaps able to focus on the clothes themselves and what would look best on their body type – I could show them things that would suit them best. The customers would probably enjoy it – makes it a fun experience (Subject #45).

*Fun.* Having fun using the technology was mentioned for all three technologies as a way to make an employee's job more interesting and as a way of changing how employees work with customers. For the body scanner, having fun was associated with the novelty of the technology, being able to see the body scan image and engage customers with the technology.

> It is very revolutionary – I think it would attract customers and it's a fun way to enhance a customer's shopping experience (Subject #53).
>
> It would make the fitting process easier and more fun. I believe customers would appreciate the advanced technology and the store taking specific interest in them (Subject #52)

The product configurator was viewed as an enjoyable tool to use when helping customers and was also referred to as a technology that participants could

play with as part of their work. The technological functions of social networking were viewed as way to make participant jobs more fun and interesting.

> It would be fun to create garment profiles and messages to send to customers (Subject #37).
>
> Social networking sites are usually interesting and fun – it would be fun to incorporate that in my work environment (Subject #39).

*Easier jobs.* The three technologies were all viewed as a way to support participants in their job tasks and make their jobs easier. Because of its efficiency and accuracy of providing customer measurement information, the body scanner was identified as able to make participants' jobs easier.

> I would put this technology in my store because it provides a service already needed but with less hassle and more assurance of exactness of size (Subject #58).

The customization and design capabilities of the product configurator were seen as a means of making participant jobs easier whenever an item was not available in the store since they could offer the customer the option of using the product configurator. It was also perceived as a visual means of collecting information on customer preferences so that participants would more easily understand what a customer was looking for while shopping.

> It would make things easier by allowing me to understand a customer's needs quicker /more efficiently (Subject #24).
>
> It would be easier to understand customer's style and preference and consequently easier to suggest other items as well (Subject #58).

Social networking would make employee work easier by eliminating some of the ambiguity in determining customer preferences and tastes.

> It would make my job easier and more productive so I could find out

exactly what they like before they come into the store to shop (Subject #52).

*Increased sales.* Participants saw all technologies as an opportunity to generate more sales of apparel through either customization or closer contact with customers. An increase in sales was associated with adopting the product configurator due to the appeal of a customized product on the part of the customer.

> I would put this technology in my store because it would probably help sell more garments if the customer is given the power to customize their garments (Subject #28).

> I would put this technology in my store to provide the customer an opportunity to customize their product choice and to give the store an opportunity for additional money from these niche product sales (Subject #63).

Social networking and the body scanner were viewed as able to increase sales through these technologies' ability to facilitate personal contact with customers.

> I think it [body scanner] would help associates interact more with the customer – find out what they want and need and make recommendations about products they may not have considered. This would help increase sales (Subject #40).

> If customers liked getting messages and liked using the software as well, it [social networking] could act as a great way to show them merchandise, build customer loyalty, and increase sales potentially (Subject #14)

> My store already uses a blog to communicate with customers about trends, new deliveries to store, recommendations on outfits for specific occasions, etc. It would be phenomenal for this to be a two-way street and allow P--------  to interact with its customers by the more efficient means of the Internet – I imagine it would have a strong impact on sales (Subject# 33).

Adoption of the technologies for purposes of communication that can serve to positively influence store sales suggested that retailers may be able to integrate more *mixed reality merchandising* (Koontz and Gibson, 2002). Virtual communication may allow retailers to alter their physical store environments or products to suit preferences expressed by customers using technologies like social networking. Retailers may also incorporate virtual technologies in the store environment to facilitate the type of *spect-actor* interactions described by Baron et al. (2001) where customers can interact with one another while employees serve as moderators or facilitators of these interactions.

*Personal.* Having relationships with customers that were closer and more personal were how participants indicated both the product configurator and social networking would change the way they worked with customers. By simply using the product configurator with a customer, participants felt that their service interaction would be more intimate and personal.

> It would allow for you to be more creative and get to know them on a more personal level by helping them pick things specific for them (Subject #17)

Social networking enabled more personal connections with customers by allowing participants to know more about customer preferences based on their

profile information or feedback and by providing a channel to support more communication between employees and customers.

> I might know them more personally. I could customize my sales tactics to their personalities (Subject #49).
>
> It would make me closer to the customers and I would be able to better help them when they come into the store (Subject #34).

Increased relationship selling (Beatty et al., 1996) may also be a result of using social networking and the product configurator as retail employees are able to gain more personal information regarding their customers' preferences when using these technologies and also have a means of effectively contacting them when items that meet their needs are available in the store. Employees may also take on new job roles similar to consultants (providing experiences) rather than sales associates (providing services) when using the product configurator and social networking as they spend more time interacting with customers discussing preferences and/or customizing products.

*Customer knowledge.* The ability to know more about the customer was a benefit of using both the product configurator and social networking according to participants. Gaining knowledge of customer clothing preferences was a way to improve work using the product configurator and social networking.

> It [product configurator] would help me to better customize the shopping experience. I could see, even from the program, what customers like. Even if they chose not to custom order an outfit, I would still be able to see what other options to show them (Subject #32).

Participants thought that social networking would educate them about design or style features of clothing and also allow them to understand and predict customer needs.

> I would be able to understand each customer better and so I would see them as individuals rather than just another customer like all the others (Subject #51).

The ability to harness customer information using these technologies also has implications for retail theater since the information could be used to stage personal experiences for customers. Social networking may prove especially useful in this regard since participants saw it as a way to understand and predict customer needs and also gain valuable service feedback. Combining this information, retailers could determine specific items that customers want and the best way to promote the items in the store with marketing and services. The information gained from these interactions could enable employees in roles supporting product development (Judson et al., 2006) for which the collection of customer data is essential.

*Positive customer reaction*. Although participants were not specifically asked to indicate their evaluations of customer reactions to the technologies, participants included customer reactions as a way of making their jobs more interesting and changing the way they would work with customers. Customer reactions to using the body scanner and product configurator were expected to be positive according to participants. Participants primarily thought customers would show a positive interest in the body scanner because it was a new technology and that this positive reaction would improve service interactions.

> This technology would excite some customers, which would create a

positive work environment (Subject #46).

> It would definitely make the customers in my high-end retail place feel more catered to – being wealthy, they usually love that (Subject #56).

For the product configurator, customers were expected to enjoy the technology because it gave them control of the selection of items they wanted.

> It would be interesting because we could see a new perspective of style. The customer is the one purchasing the item so it should be what they want (Subject #25).
>
> I'm sure that customers would find it interesting and fun. More customers might even come into the store because the program is so enjoyable (Subject #32).

Enjoyment in using the technology and the ability to build relationships may support employee interaction with customers who are *digital experience seekers* (Fiore, 2008) and looking for enjoyable shopping experiences that involve technology. The mutual enjoyment by customers and employees from using technology may serve to provide memorable encounters (experiences) for these customers. Furthermore, the observation that customer reactions were an interesting part of work may also suggest that retail employees are prepared for retail theater roles where employees do not actively engage with customers but take on roles that involve using props (like technology) to support the customer experience (Baron et al., 2001). One participant suggested the application of social networking in the store environment in a way that did not involve employee-customer communication:

> Customers should be able to access a computer to input data into a profile while shopping – with hand-helds, like when registering for a wedding (Subject # 35).

This participant imagined a customer independently using technology inside the store to personalize an online social networking profile. This application of social networking technology might be suitable for creating in-store experiences for customers who are *digital content creators* (Fiore, 2008) while retail employees are able to observe and keep track of items selected by the customer.

Participant responses to the open-ended questions indicated that the technologies examined in this study, from the perspective of apparel retail employees, were not only useful for making them more efficient or accurate in their jobs but that these technologies were also able to support customer relationships through increased interaction and information. The technologies served as tools (or props) that could introduce aspects of the *Experience Economy* and *retail theater* to apparel retail work by making jobs more engaging through creativity or fun, and by enabling a key activity of the *Experience Economy* -- customization of apparel. Participant interest in the new job roles of design consultant and fit expert may also indicate that apparel retail employees are ready to embrace these jobs, and perhaps other new roles, that require increased knowledge and customer interaction beyond traditional retail service jobs.

**Fashioned for the Future: The Apparel Retail Technology Experience**

The future of apparel retail stores may include a growing number of retailers who adopt Nike's model of technology-enabled customer experiences inside the store. Themes identified in this study suggest that adoption of hybrid technologies could benefit the traditional factors associated with retail success -- service, efficiency and increased sales – as well as new areas that may define success as retailers are challenged to move towards experiences. The

benefits include closer, more personal interaction with customers and retail employees who enjoy their work. Hybrid stores and technology interfaces may become the standard for retailers not just to appeal to customers who are digitally savvy but to build relationships between customers and employees or to increase employee efficiency and productivity. Hybrid stores may also be able to quickly modify inventory or in-store displays to meet needs of local customers based on feedback received through virtual channels like social networking. Mass customization may become a business model or branding strategy for retailers throughout their organization as they could offer mass customized manufacturing of products or even create custom store visual and marketing displays designed around consumer preferences.

Nike's goal of implementing in-store customization and production approximated the experiences that customers already have at food retailers like *Starbucks* or *Panera* where they can both customize and consume. This next level of customization could prove an advantage for retailers like Nike with a strong brand and customer base and a reputation for creating customer experiences. For retailers that do not have a strong brand or customer base, social networking may be an essential tool for building customer relationships and marketing the brand to potential customers while also allowing retail employees to gain more information about customer preferences. Once retailers have established interest around the brand, they may be able to introduce technologies that support customization. Customers may have more interest in the process based on their familiarity with the brand and retail employees may be better informed to assist customers and support the customization experience using the knowledge already gained during prior interactions with customers through social networking.

To illustrate the various experiences possible based on the introduction of technology to the apparel store, a designer's rendition of a new apparel retail concept designed around customer interaction with the store and its products, illustrates how technology can be a key element in delivering experiences. This store concept features both a body scanner to take customer measurements and a consultation area where employees and customers can view the scan image and then customize the shoppers clothing selection (see Figure 6.2).


**Figure 6.2. *LUX* Concept Store (images courtesy of Jessica Haswell, Cornell University, Design & Environmental Analysis). Copyright 2009 Jessica Haswell. Reprinted with permission.**

Additionally, the Express example presented earlier in the paper was edited from its original series of events and conceptualized to imagine where technologies examined in this study and other technological innovations might be incorporated into an apparel retailer's practices in the future.

***EXPRESS***

*Fashion at the speed of the Future*

*As part of a new denim campaign Express stores launched its new custom-fitted jeans using its social networking site to alert loyal customers of the new arrivals in stores and offering them the opportunity to reserve a pair that they could pick up in the store or have shipped to her home. Using the stored body scan measurement data found in the customer's profile, a custom fit pair of jeans would be shipped via the company's Fashion Delivery service to the customer and billed to her store credit account. If she decided to pick her jeans up at the store, EXPRESS offered a 30% discount on any items purchased that day in the store.*

*Lucy just received notification of this event from the company on her ExpressFashion social networking page and the store manager at her local EXPRESS also sent her a separate message inviting Lucy to the special in-store event to celebrate the new product launch along with images of some other new items the store just received that she thinks would go well with Lucy's new jeans. Lucy selects the image of her 3D body scan stored in her profile and clicks on the images Tina has sent so that she can see what she would look like in the garments. Lucy liked the fit of a dress that Tina recommended so she decides that a*

*store trip would be worthwhile to use her discount and see the new items. Lucy messages the store manager that she will be coming in on the weekend to pick up her jeans and look at the dress. EXPRESS manager Tina receives Lucy's message on her mobile data storage device – the FashionAssistant - delighted that Lucy will be coming into the store, Tina immediately uses the FashionAssistant to confirm that the dress Lucy wants to see is available in her size. She walks over to the display where all the new items have been placed and scans the dress she suggested to Lucy. The FashionAssistant detects the information stored in the RFID tag placed on the dress and shows Lucy her current store inventory for the item. Tina sees that Lucy's size is available so she enters a reminder in the FashionAssistant to make sure the dress is placed in one of the fitting rooms the morning that Lucy plans to visit the store.*

*Saturday arrived and Lucy is anxious to pick up her new jeans and try on the new dress. She invites her friend Pam along for the shopping trip. Tina has already arrived at the store early to prepare for the special event. She places her FashionAssistant on the store's interactive checkout counter surface so it could display the list of events for the day and she sees that Lucy will be coming in and that a dress needs to be set aside for her to try. A digital image of the dress is shown next to the message reminder and Tina scrolls through the list of sales associates that will be working that day whose names are displayed on the surface screen. Tina touches the dress image and drags the message to the name of the associate who will be managing the fitting rooms so that it will be displayed on the interactive mirror located in the*

*fitting area when the associate arrives.*

*When Lucy comes into the EXPRESS store later that day she receives a text message on her phone from one of the sales associates who saw her name on the store's guest list displayed on her FashionAssistant. Since Lucy registered with the store's customer loyalty program she has activated her cell phone to alert employees of her arrival in the store. The text message also tells Lucy that her items are waiting for her in the fitting room area. Pam decides to look around the store while Lucy tries on her items. Once at the fitting room, Lucy is greeted by the store associate and shown to one of the fitting rooms where her items are already hanging inside. The virtual mirror inside the fitting room displays a welcome message to Lucy and shows icons for her to request assistance, view other store merchandise or make a purchase. Lucy likes the jeans and the dress she tried on since they fit perfectly so she selects the purchase option on the mirror screen. Her items are billed to her store account and the sales associate packaged them for her on the way out of the fitting area. Lucy searches for her friend Pam in all the excitement of the store event. She spots Pam in the EXPRESS Design Studio space near the back of the store and walks over.*

*The design studio is outfitted with customization stations and a body scanner, along with images of customer designs and detailed descriptions of the styles each of them created. Digital displays with photos of the customers wearing designs are prominently featured throughout the studio so that the customer has a sense of the individuality behind each apparel style. Product information regarding*

*fabric types, construction techniques and tailored garment options are given to shoppers looking to customize their own wardrobe.*

*Inside the Design Studio, Pam is standing in front of a wall display with one of the store's Fashion Brand Designers using an interactive touch screen that shows product information when activated by human touch. Pam tells Lucy that she just finished getting a body scan and is now customizing a pair of jeans since she needs a size that is not available in the store. Lucy tells her that she should try the jeans she just purchased since they fit perfectly. The Fashion Brand Designer asks to see the jeans Lucy purchased and then holds them close to the touch screen. The screen detects the RFID tag information and shows an image of the item. The designer then drags the image over to Pam's body scan image. Pam sees how the jeans will fit her and decides they are too short and finishes customizing her own pair with the designer. When finished, the designer informs Pam that her jeans will be ready the following day and can be delivered via the FashionDelivery service or picked up at the store. Pam opts for the delivery and receives a FashionInsider card loaded with her body scan image, measurements, image of the jeans she customized and proof of purchase information. The designer tells her that the card can be used to check the status of her item online or on any of the interactive surfaces inside the store including the virtual display tables or mirrors in the fitting rooms. The designer also encourages Pam to join the local EXPRESS social network to receive more product updates and visit the Express virtual store in Second Life where she can view her body scan image as an avatar wearing the jeans she customized.*

The three technologies studied here represent only a few of the possibilities apparel retailers may explore as they transition from services to experiences. Deciding to incorporate technology into the store environment may not be an option for future retailers as they continue to compete in areas of service, efficiency and profit. This study revealed how retail employees already associate technology use with benefits in these core areas of retail success. Apparel retailers may further increase their competitiveness by adding technology interfaces like social networking that allow employees to know more about customer preferences based on direct feedback from customers instead of solely on data stored in point-of-sale systems that track customer purchases.

Other interfaces may serve not only as a means of collecting customer feedback but also to provide experiences that are enjoyed by both customers and employees in the apparel retail environment. Physical spaces in retail stores might be dedicated to retail *props* like body scanners or design stations where services are provided for fun and not necessarily as part of a sales transaction, but rather an experience. Additionally, retailers can help customers connect their online and in-store shopping experiences through virtual technologies or visual displays that re-create the interactivity of websites with the instant gratification of purchasing an item in the store. Customers may eventually expect stores to keep pace with their personal technology use, and employees, as seen with this study, already perceive benefits in their work environment from using technology.

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# APPENDICES

# APPENDIX A

## IRB Approval Form

Cornell University
Office of
Research Integrity and Assurance

**Institutional Review Board**
Suite 320, East Hill Office Building
395 Pine Tree Road
Ithaca, New York 14850
t. 607.255.5138
f. 607.255.0708
http://www.irb.cornell.edu

**NOTIFICATION OF EXPEDITED APPROVAL**

**Protocol ID#** 08-07-007
**Termination Date:** 8/26/2009

To: Tasha Lewis
From: Jennifer Gerner, IRB Chair
Date of approval: August 27, 2008 *(If you are using a consent form, enter this date at the bottom of it now.)*
Project(s): ***Technology Enabled Apparel Retail Employees: Enhancing Customer Interaction and Professional Development***

As Chairperson of the Institutional Review Board for Human Participants (IRB), I have reviewed and given an expedited approval to the above referenced project as far as the use of human participants is concerned. **This approval shall remain in effect for a period of one year.**

The terms of Cornell University's Federalwide Assurance (FWA) with the federal government mandate the following important conditions for investigators:

1. All consent forms, records of study participation, and other consent materials **must** be held by the investigator for **five years** after the close of the study.
2. Investigators must submit to the IRB any **proposed amendment** to the study protocol, consent forms, interviews, recruiting strategies, and other materials. Investigators may not use these materials with human participants until the IRB has reviewed them. For information about study amendment procedures and access to the Amendments application form, please refer to the IRB website: http: //www.irb.cornell.edu/forms.
3. Investigators must promptly report to the IRB any **unexpected events** involving human participants. The definition of prompt reporting depends upon the seriousness of the unexpected event. For guidance on recognizing, defining, and reporting unexpected events to the IRB, please refer to the IRB website: http://www.irb.cornell.edu/forms.

If the use of human participants is to continue beyond the assigned approval period, federal requirements mandate that the protocol be re-reviewed and receive an updated approval. **You may not continue to use human participants beyond the stated approval period without an updated approval**. Please note that the terms of our FWA with the federal government do not allow for an extension of this period without review. Continuing without an updated approval constitutes a violation of University policy and federal regulations. Research funds administered by Sponsored Program Services will not be released to any project that does not have a current IRB approval.

Two months before the expiration of your approval, you will be sent a notification of pending expiration, and an explanation of the renewal process. Applications for renewal of approval must be submitted sufficiently in advance of the expiration date to permit the IRB to conduct its review before the current approval expires. Please allow at least two weeks for the review.

***If you do not plan to renew your protocol approval at the end of the year, you must provide the IRB with a Project Closure form. A link to the Project Closure form can be found at http://www.irb.cornell.edu/forms.***

c: Suzanne Loker

# APPENDIX B

**Technology Enabled Apparel Retail Employees**
**Consent Form**

*You have been invited to participate in a research study of how apparel retail employees use new technology. We are asking you to participate because you are currently a retail employee or in a training program that may prepare you for a retail/ customer service position. Please read this form carefully and ask any questions you may have before agreeing to take part in this study.*

**What the study is about**: The purpose of this study is to learn how retail employees will use new technology for customer service and to support their own job development.

**What we will ask you to do**: If you agree to be in this study, we will show you different technologies for to the apparel retail industry for you to observe and will also be asked to try the technology. After seeing and using the technology, you will be asked to complete a survey about what you think about the technology, your background in retail and other technologies that you use or have used. Seeing and using the technologies will take about 20 minutes and completing the survey will also take about 15 to 20 minutes.

**Risks and Benefits**: We do not anticipate any risks to you participating in this study other than those encountered in day-to-day life. You may benefit from learning about new technologies that may increase job knowledge as well as receive some training for technologies that may soon become a part of your work environment.

**Voluntary Nature of Participation**: Your participation is VOLUNTARY. You may skip any questions that you do not want to answer. If you decide not to take part or skip some of the questions, it will not affect your current or future relationship with Cornell University. If you decide to take part, you are free to withdraw at any time.

**Privacy and Confidentiality**: Your privacy and confidentiality will be maintained. The records of this study will be kept private in a locked file; only the researchers will have access to the records. In any sort of report we make public we will not include any information that will make it possible to identify you.

**Questions**: You are encouraged to ask any questions at any time about this project by contacting Tasha Lewis at (607) 255-1853 or TLL28@cornell.edu. If you have any questions or concerns regarding your rights as a subject in this study, you may contact the Institutional Review Board (IRB) at 607-255-5138 or access their website at http://www.irb.cornell.edu..

**Consent**
*Your signature indicates that you have read the information provided and that you wish to participate. Please keep a copy of this agreement.*

I have read the above information, and have received answers to any questions I asked. I consent to take part in the study.

Print Name:_____

Your Signature:_____Date:_____

*This consent form will be kept by the researcher for at least three years beyond the end of the study and was approved by the IRB on August 27,2008.*

# APPENDIX C

## Instrument

**Subject#_____**

**Please answer the questions below about yourself.**

1. **Name of retail store where you work:** _____ ☐ **part-time** **or** ☐ **full-time**

2. **Product category (mark the type closest to what is sold in the store where you work).** ***Mark only one.***
   - Children's clothing and accessories only
   - Women's clothing and accessories only
   - Men's clothing and accessories only
   - Women's, Men's and Children's clothing and accessories
   - Other

**Please indicate how much you agree with the statements below:**

| | | Strongly Disagree -2 | Disagree -1 | Neither Agree Or Disagree 0 | Agree +1 | Strongly Agree +2 |
|---|---|---|---|---|---|---|
| 1. | When performing my job, the customer is most important to me | ○ | ○ | ○ | ○ | ○ |
| 2. | It is best to make sure that our customers receive the best possible service available | ○ | ○ | ○ | ○ | ○ |
| 3. | If possible, I meet all requests made by my customers | ○ | ○ | ○ | ○ | ○ |
| 4. | As an employee responsible for providing service, customers are very important to me | ○ | ○ | ○ | ○ | ○ |
| 5. | I believe that providing timely, efficient service to customers is a major function of my job | ○ | ○ | ○ | ○ | ○ |

**Often in our jobs we are introduced to new computer software or technology that is available to make our jobs easier. For the following questions imagine that you are given a new software package to use for some part of your work. It doesn't matter specifically what the software package does, only that it is meant to make your job easier and that you have never used it before.**

*The following questions ask you to indicate whether you could use this unfamiliar software in several different situations. For each situation, please indicate whether you think you would be able to complete the job using the software package. Then, for each situation for which you answered "yes", please rate your confidence in using the technology by circling a number from "1" to "10", where 1 indicates "Not At All Confident" and 10 indicates "Totally Confident". (See the example below)*

| | | | | | | | | | | ○ **No** |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| • **Yes** | ○ | ○ | ○ | ○ | ○ | ○ | • | ○ | ○ | ○ |
| | Not at all Confident | | | | | Moderately Confident | | | | Totally Confident |

**I COULD COMPLETE MY JOB USING THE SOFTWARE PACKAGE:**

**(1) ...if there was no one around to tell me what to do as I go.**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | ○ No |
| ○ Yes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | Not at all Confident | | | | | Moderately Confident | | | | Totally Confident | |

**(2) ...if I had never used a technology like it before**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | ○ No |
| ○ Yes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | Not at all Confident | | | | | Moderately Confident | | | | Totally Confident | |

**(3) ...if I had only the manuals for reference**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | ○ No |
| ○ Yes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | Not at all Confident | | | | | Moderately Confident | | | | Totally Confident | |

**(4) ...if I had seen someone else using it before trying it myself**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | ○ No |
| ○ Yes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | Not at all Confident | | | | | Moderately Confident | | | | Totally Confident | |

**(5) ...if I could call someone for help if I got stuck**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | ○No |
| ○ Yes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | Not at all Confident | | | | | Moderately Confident | | | | Totally Confident | |

**(6) ...if someone else had helped me get started**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | ○No |
| ○ Yes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | Not at all Confident | | | | | Moderately Confident | | | | Totally Confident | |

**(7) ...if I had just a built-in help screen for assistance**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | ○No |
| ○ Yes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | Not at all Confident | | | | | Moderately Confident | | | | Totally Confident | |

**(8) ...if I had a lot of time to complete the job for which the software was provided**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | ○No |
| ○ Yes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | Not at all Confident | | | | | Moderately Confident | | | | Totally Confident | |

**(9) ...if someone showed me how to do it first**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | ○No |
| ○ Yes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | Not at all Confident | | | | | Moderately Confident | | | | Totally Confident | |

**(10) ...if I had used similar software packages before this one to do the same job**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | ○ No |
| ○ Yes | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | Not at all Confident | | | | | Moderately Confident | | | | Totally Confident | |

**Stop Here and Wait for Researcher Instructions**

**Please answer the questions below based on the technology you have just used.**

**Time:_____**

## Body Scanner

**1. The body scanner is capable of size selection. Size selection is the process of comparing a person's body measurements with different clothing sizes and then picking the size that would fit the person best based on his or her measurements. In my job, size selection is:**

| -3 Extremely Unimportant | -2 Quite Unimportant | -1 Slightly Unimportant | 0 Neither Important or Unimportant | + 1 Slightly Important | +2 Quite Important | +3 Extremely Important |
|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

| | Extremely Unlikely -3 | Quite Unlikely -2 | Slightly Unlikely -1 | Neither Likely Or Unlikely 0 | Slightly Likely +1 | Quite Likely +2 | Extremely Likely +3 |
|---|---|---|---|---|---|---|---|
| **2. Learning to operate the body scanner would be easy for me** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **3. I would find it easy to get the body scanner to do what I want it to do** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **4. My interaction with the body scanner would be clear and understandable** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **5. I would find the body scanner to be flexible to interact with** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **6. It would be easy for me to become skillful at using the body scanner** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **7. I would find the body scanner easy to use** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **8. Using the body scanner in my job would allow me to accomplish tasks more quickly** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **9. Using the body scanner would improve my job performance** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **10. Using the body scanner in my job would increase my productivity** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **11. Using the body scanner would enhance my effectiveness on the job** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **12. The body scanner would make it easier to do my job** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **13. I would find the scanner useful in my job** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **14. I would find using the body scanner to be enjoyable** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **15. I would have fun using the body scanner** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **16. Assuming the body scanner would be available on your job, predict how likely you are to use it on a regular basis** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**17. Using the body scanner would be**

| -3 Extremely Unpleasant | -2 Quite Unpleasant | -1 Slightly Unpleasant | 0 Neither Pleasant or Unpleasant | + 1 Slightly Pleasant | +2 Quite Pleasant | +3 Extremely Pleasant |
|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**18. Assuming the body scanner would be available on your job, predict how probable it is that you will use it on a regular basis**

| -3 Extremely Improbable | -2 Quite Improbable | -1 Slightly Improbable | 0 Neither Improbable or Probable | + 1 Slightly Probable | +2 Quite Probable | +3 Extremely Probable |
|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

(More questions on the back)

**Please respond to questions below in your own words**

**(19) How could you imagine the body scanner helping you to do your job better?**

**(20) How would using the body scanner make your job more interesting?**

**(21) How would using a body scanner change the way you work with customers?**

**(22) If you could make the decision about adopting this type of technology for your store, WHY would or wouldn't you put this technology in your store?**

**(23) Any other comments about the relevance of this technology to your job?**

**Please answer the questions below based on the technology you have just used.**

**Time:_____**

## Product Configurator (DigiKids)

**1. DigiKids is a type of electronic tool called a "product configurator". A product configurator allows the user to customize clothing by selecting styles, colors or other features he or she would like. In my job, customizing clothing is:**

| -3 | -2 | -1 | 0 | + 1 | +2 | +3 |
|---|---|---|---|---|---|---|
| Extremely Unimportant | Quite Unimportant | Slightly Unimportant | Neither Important or Unimportant | Slightly Important | Quite Important | Extremely Important |
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

| | Extremely Unlikely -3 | Quite Unlikely -2 | Slightly Unlikely -1 | Neither Likely Or Unlikely 0 | Slightly Likely +1 | Quite Likely +2 | Extremely Likely +3 |
|---|---|---|---|---|---|---|---|
| **2. Learning to operate DigiKids would be easy for me** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **3. I would find it easy to get DigiKids to do what I want it to do** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **4. My interaction with DigiKids would be clear and understandable** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **5. I would find DigiKids to be flexible to interact with** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **6. It would be easy for me to become skillful at using DigiKids** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **7. I would find DigiKids easy to use** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **8. Using DigiKids in my job would allow me to accomplish tasks more quickly** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **9. Using DigiKids would improve my job performance** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **10. Using DigiKids in my job would increase my productivity** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **11. Using DigiKids would enhance my effectiveness on the job** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **12. DigiKids would make it easier to do my job** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **13. I would find DigiKids useful in my job** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **14. I would find using DigiKids to be enjoyable** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **15. I would have fun using DigiKids** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **16. Assuming technology like DigiKids would be available on your job, predict how likely it is for you to use it on a regular basis** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**17. Using the DigiKids would be**

| -3 | -2 | -1 | 0 | + 1 | +2 | +3 |
|---|---|---|---|---|---|---|
| Extremely Unpleasant | Quite Unpleasant | Slightly Unpleasant | Neither Pleasant or Unpleasant | Slightly Pleasant | Quite Pleasant | Extremely Pleasant |
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

**18. Assuming technology like DigiKids would be available on your job, predict how probable it is for you to use it on a regular basis**

| -3 | -2 | -1 | 0 | + 1 | +2 | +3 |
|---|---|---|---|---|---|---|
| Extremely Improbable | Quite Improbable | Slightly Improbable | Neither Improbable or Probable | Slightly Probable | Quite Probable | Extremely Probable |
| ☐ | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

(More questions on the back)

**Please respond to questions below in your own words**

**(19) How could you imagine DigiKids helping you to do your job better?**

**(20) How would using DigiKids make your job more interesting?**

**(21) How would using DigiKids change the way you work with customers?**

**(22) If you could make the decision about adopting this type of technology for your store, WHY would or wouldn't you put this technology in your store?**

**(23) Any other comments about the relevance of this technology to your job?**

**Please answer the questions below based on the technology you have just used.**

**Time:_____**

## Social Networking

**1. A social network allows people to communicate with others in their same area, group or network of acquaintances. A social network can allow salespeople to gather and review feedback from customers about products. In my job, gathering feedback from our customers about our store's products is:**

| -3 | -2 | -1 | 0 | + 1 | +2 | +3 |
|---|---|---|---|---|---|---|
| Extremely Unimportant | Quite Unimportant | Slightly Unimportant | Neither Important or Unimportant | Slightly Important | Quite Important | Extremely Important |
| □ | □ | □ | □ | □ | □ | □ |

| | Extremely Unlikely -3 | Quite Unlikely -2 | Slightly Unlikely -1 | Neither Likely Or Unlikely 0 | Slightly Likely +1 | Quite Likely +2 | Extremely Likely +3 |
|---|---|---|---|---|---|---|---|
| **2. Learning to operate social networking would be easy for me** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **3. I would find it easy to get social networking to do what I want it to do** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **4. My interaction with social networking would be clear and understandable** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **5. I would find social networking to be flexible to interact with** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **6. It would be easy for me to become skillful at using social networking** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **7. I would find social networking easy to use** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **8. Using social networking in my job would allow me to accomplish tasks more quickly** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **9. Using social networking would improve my job performance** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **10. Using social networking in my job would increase my productivity** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **11. Using social networking would enhance my effectiveness on the job** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **12. Social networking would make it easier to do my job** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **13. I would find social networking useful in my job** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **14. I would find using social networking to be enjoyable** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **15. I would have fun using social networking** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| **16. Assuming social networking would be available on your job, predict how likely it is for you to use it on a regular basis** | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

**17. Using social networking would be**

| -3 | -2 | -1 | 0 | + 1 | +2 | +3 |
|---|---|---|---|---|---|---|
| Extremely Unpleasant | Quite Unpleasant | Slightly Unpleasant | Neither Pleasant or Unpleasant | Slightly Pleasant | Quite Pleasant | Extremely Pleasant |
| □ | □ | □ | □ | □ | □ | □ |

**18. Assuming social networking would be available on your job, predict how probable it is for you to use it on a regular basis**

| -3 | -2 | -1 | 0 | + 1 | +2 | +3 |
|---|---|---|---|---|---|---|
| Extremely Improbable | Quite Improbable | Slightly Improbable | Neither Improbable or Probable | Slightly Probable | Quite Probable | Extremely Probable |
| □ | □ | □ | □ | □ | □ | □ |

(More questions on the back)

**Please respond to questions below in your own words**

**(19) How could you imagine social networking helping you to do your job better?**

**(20) How would using social networking make your job more interesting?**

**(21) How would using social networking change the way you work with customers?**

**(22) If you could make the decision about adopting this type of technology for your store, WHY would or wouldn't you put this technology in your store?**

**(23) Any other comments about the relevance of this technology to your job?**

## Please answer the following questions about yourself

**1. Please mark the job position that is closest to your current job**
***(Mark only one)***

○ not currently working in retail ○Trainee ○ Sales Associate ○ Assistant Manager
○ Store Manager ○ Senior Store Manager ○ Assistant District Manager ○ District Manager
○ Regional Manager ○ Regional Vice President

**2. Please indicate the HIGHEST job position you expect to have in retail**
*(Mark only one)*

○ Sales Associate ○ Assistant Manager ○ Store Manager ○ Senior Store Manager
○ Assistant District Manager ○ District Manager ○ Regional Manager ○ Regional Vice President

**3. How sure are you about this career goal?**

| -2 | -1 | 0 | +1 | +2 |
|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ |
| **Very Unsure** | **Unsure** | **Neither Unsure or Sure** | **Sure** | **Very Sure** |

## What is the probability that each of the following activities will help you obtain your career goals?

| | Very Low Probability | Low Probability | Moderate Probability | High Probability | Very High Probability |
|---|---|---|---|---|---|
| **4. Using the body scanner to help customers select clothing sizes** | ○ | ○ | ○ | ○ | ○ |
| **5. Using technology like DigiKids to help customers design clothing** | ○ | ○ | ○ | ○ | ○ |
| **6. Using social networking to gather customer feedback** | ○ | ○ | ○ | ○ | ○ |

## Please indicate your interest in each of the following jobs

**7. A design consultant (helps a customer design clothing)**

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ |
| No Interest | | | | Very Interested |

**8. A fit expert (helps a customer find the best fitting clothing by taking measurements)**

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ |
| No Interest | | | | Very Interested |

**9. What is your age?** _____

**10. Gender**
□ Male □ Female

**11. What is your highest level of education?**

○ High School
○ Some College
○ Associate's Degree
○ Bachelor's Degree
○ Graduate School

**(One More question on the back)**

12. **What types of personal technologies have you used?**
(Mark all that apply)

- ○ Personal computer
- ○ MP3/ iPod
- ○ Digital camera
- ○ PDA/ Blackberry
- ○ Gaming system (Playstation, Wii)
- ○ Social networks (Facebook, MySpace)
- ○ Web design
- ○ Cell phone

**Please give your questionnaire to the researcher before leaving**

**Thank you for your participation in this study!**

## APPENDIX D

## Technology Scripts

Body Scanner

*The body scanner operates by having a customer enter an enclosed chamber where white light is used to capture the shape of the body by taking over 300,000 points. Software designed for use with the scanner turns the points into body measurements. A process known as "size selection" can compare the customer's measurements with those of a clothing company and suggest styles to the customer that will fit best. To use this technology, imagine that you are helping a customer find the right size and will have them get a body scan to do this.*

DigiKids

*DigiKids is a type of technology called a product configurator. It allows a user to customize clothing or shoes with different colors or other design features with computer software. This technology is normally found on the Internet but is beginning to appear in stores. To use this technology, imagine that you are helping a customer design their own clothing.*

Social Networking

*Social networking allows users to communicate with other people in the same town, neighborhood, college or in other groups that share similar interests. This is the technology behind websites like Facebook and MySpace. Retail stores that sell clothing are beginning to use this technology to communicate with their customers and also to allow them to communicate with their friends while shopping. To use this technology, imagine that you are using the Internet to ask customers for their comments on clothing your store is selling.*

# APPENDIX E

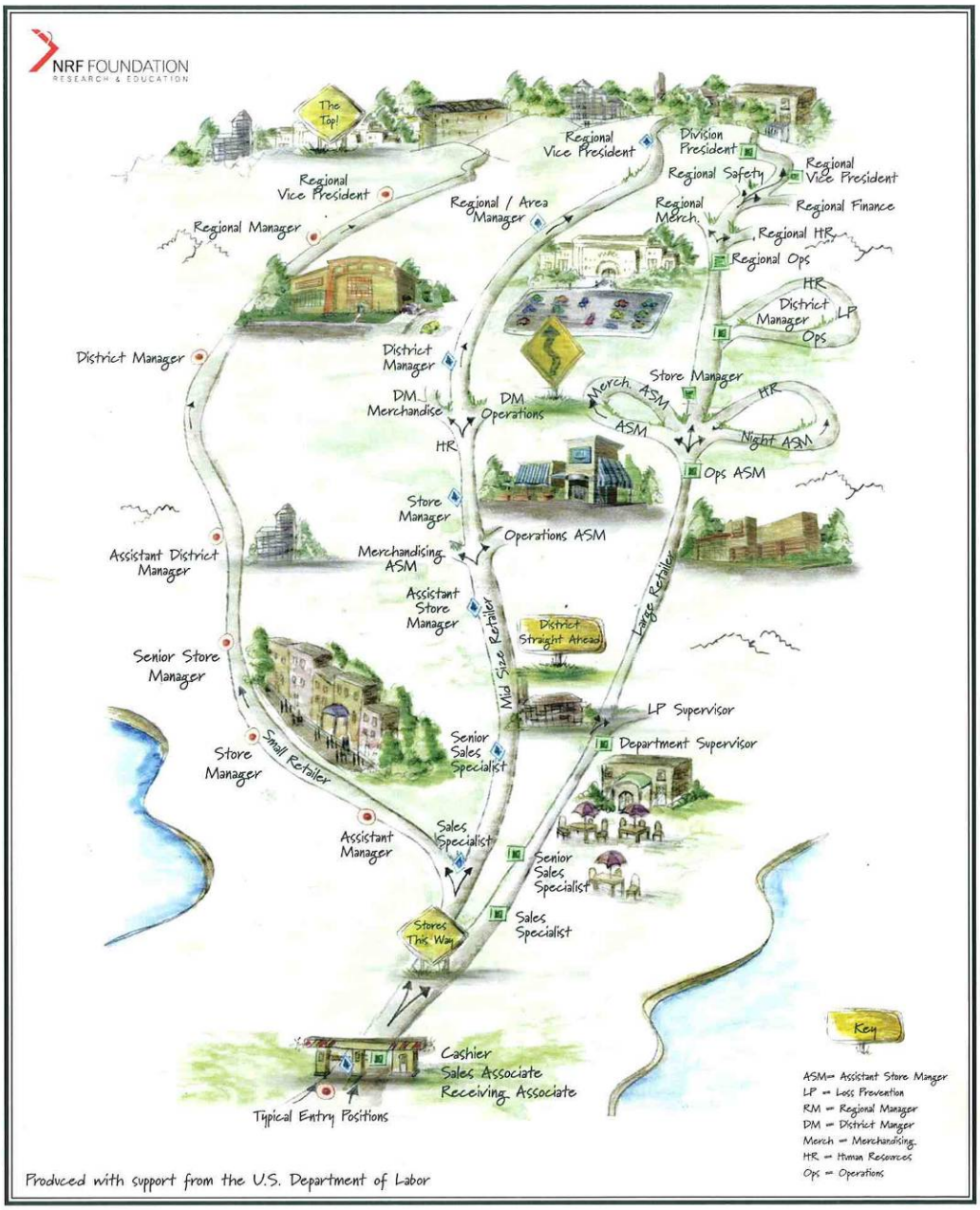
## Factor Analysis for TAM variables

| | | | Item Loadings | | | |
|---|---|---|---|---|---|---|
| Technology | Item | Cronbach's α | Factor 1 | Factor 2 | Factor 3 | Variance Explained |
| Body Scanner | | | | | | |
| | EOU1 | | .05 | **.89** | .00 | |
| | EOU2 | | .34 | **.80** | .10 | |
| | EOU3 | | .21 | **.76** | .34 | |
| | EOU4 | | .34 | **.63** | .41 | |
| | EOU5 | | .35 | **.74** | .10 | |
| *n=71* | EOU6 | .89 | .20 | **.85** | .10 | 26.9% |
| | USF1 | | **.80** | .25 | .09 | |
| | USF2 | | **.87** | .29 | .09 | |
| | USF3 | | **.90** | .20 | .09 | |
| | USF4 | | **.86** | .22 | .14 | |
| | USF5 | | **.87** | .22 | .15 | |
| *n=70* | USF6 | .94 | **.78** | .14 | .39 | 32.1% |
| | ENJ1 | | .18 | .13 | **.92** | |
| | ENJ2 | | .18 | .14 | **.87** | |
| *n=70* | ENJ3 | .85 | .08 | .13 | **.81** | 18.6% |
| Product Configurator | | | | | | |
| | EOU1 | | .09 | .03 | **.81** | |
| | EOU2 | | .39 | **.47** | .37 | |
| | EOU3 | | .17 | **.60** | **.59** | |
| | EOU4 | | .46 | **.56** | .24 | |
| *n=71* | EOU5 | | .11 | .30 | **.86** | |
| | EOU6 | .79 | .07 | -.07 | **.80** | 17.7% |
| | USF1 | | **.90** | .25 | .07 | |
| | USF2 | | **.91** | .22 | .07 | |
| | USF3 | | **.93** | .15 | .18 | |
| | USF4 | | **.92** | .16 | .17 | |
| | USF5 | | **.88** | .28 | .09 | |
| *n=68* | USF6 | .96 | **.74** | .30 | .02 | 35.2% |
| | ENJ1 | | .22 | **.89** | .04 | |
| | ENJ2 | | .18 | **.90** | .01 | |
| *n=67* | ENJ3 | .91 | .31 | **.80** | .05 | 23.7% |
| Social Networking | | | | | | |
| | EOU1 | | .06 | **.83** | .02 | |
| | EOU2 | | .09 | **.71** | .23 | |
| | EOU3 | | .12 | **.83** | .03 | |
| | EOU4 | | .38 | **.70** | .09 | |
| | EOU5 | | .15 | **.74** | .25 | |
| *n=68* | EOU6 | .87 | .16 | **.75** | .09 | 24.8% |
| | USF1 | | **.73** | .30 | .11 | |
| | USF2 | | **.85** | .19 | .13 | |
| | USF3 | | **.83** | .15 | -.03 | |
| | USF4 | | **.82** | .19 | .23 | |
| | USF5 | | **.88** | .04 | .21 | |
| *n=71* | USF6 | .93 | **.75** | .07 | .26 | 28.6% |
| | ENJ1 | | .27 | .19 | **.87** | |
| | ENJ2 | | .18 | .13 | **.92** | |
| *n=71* | ENJ3 | .90 | .14 | .16 | **.84** | 17.5% |

Note. EOU: perceived ease of use; USF: perceived usefulness; ENJ: perceived enjoyment.

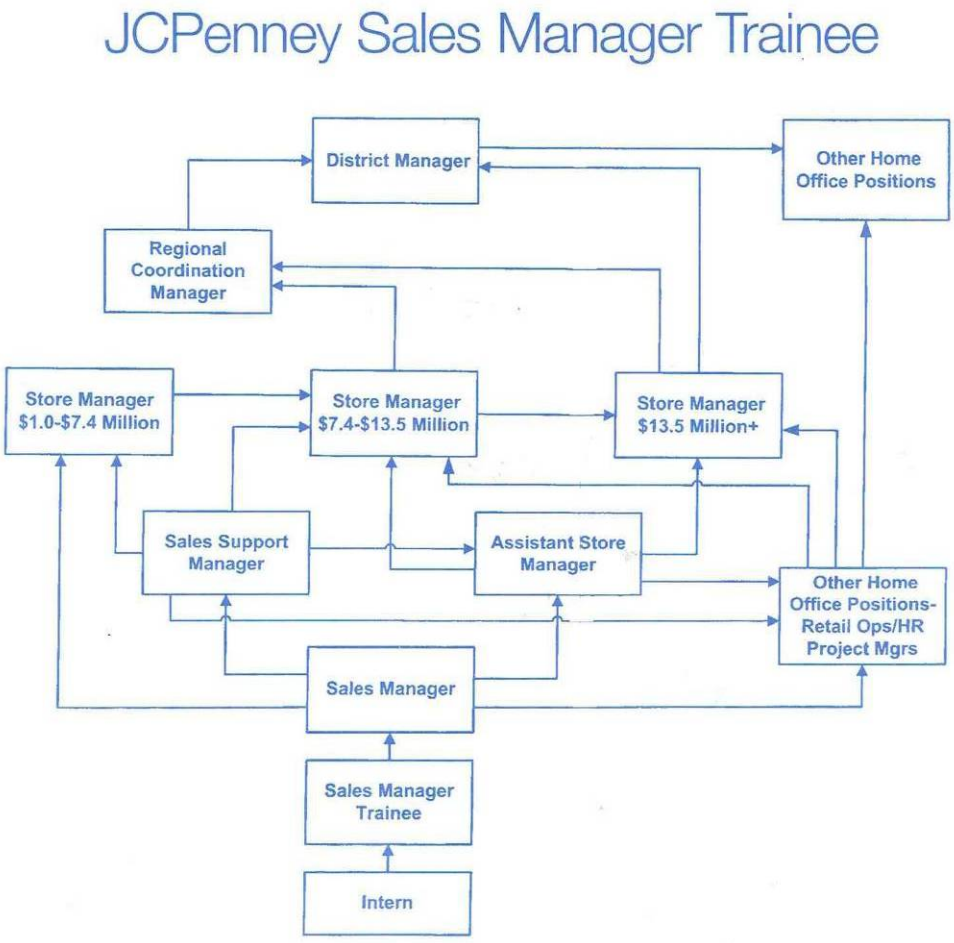
## APPENDIX F

## National Retail Federation Career Paths



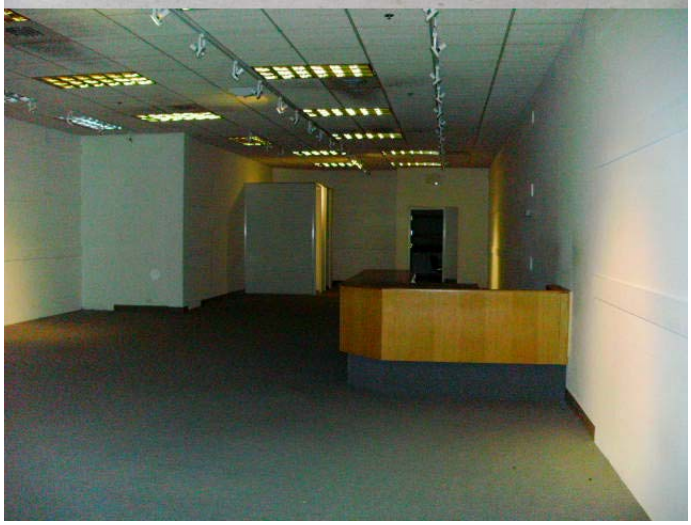
## APPENDIX G

## JC Penney Store Sales Manager Career Path



## APPENDIX H

## Site 1
## Set-up of Technologies

## APPENDIX I

## Site 2
## Set-up of Technologies

APPENDIX J

## Definitions

For the purpose of this study, the following terms were defined as:

***Apparel industry*** *–" All companies and individuals concerned with the design, production, and distribution of textile and apparel goods" (Dickerson, 2003)*

***Department store*** *– "a retailer that carries a wide variety and deep assortment, offers considerable customer services, and is organized into separate departments for displaying merchandise" (Levy & Weitz, 2001)*

**Mass retaile*r*** *– "stores that carry a wide assortment of products and have accessible locations to provide one-stop shopping" (Samli, 1998)*

***Retailer*** *– "a business that sells products and services to consumers for their personal or family use" ( Levy & Weitz, 2001)*

***Specialty store*** *– "store concentrating on a limited number of complementary merchandise categories and providing a high level of service in an area typically under 8,000 square feet" (Levy & Weitz, 2001)*