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EXPLORING A SEE-BASED SERVICE INNOVATION FOR THE FAST FASHION APPAREL INDUSTRY - A CASE STUDY OF THE FASHION INSTITUTE OF TAIPEI IN TAIWAN

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Abstract

The purpose of this study was to explore how the Fashion Institute of Taipei (FIT) develops competitive advantage by providing value-added innovative services within local fashion-related businesses. To this end, we adopted the perspective of service experience engineering (SEE) to examine the way that managers introduce industrial value chain and service design models to promote their new service experience. This case study will illustrate how Quality Function Deployment (QFD) was used to develop new service activities and provide counsel to those that may want to implement service innovation. Thirteen service innovations and five constructs were developed for institutions which have to deal with rapid changes in fashion trends. The FIT has played the role of an integrative design service provider using IT technology to enhance its competitiveness.

Keywords: Service Experience Engineering (SEE), Service Innovation, Fast Fashion, Apparel industry, customer satisfaction, service quality

1. INTRODCUTION

The market for fashion apparel has developed rapidly around the world. Many developed countries have adopted policies to support developments in this area in the hopes of enhancing national prestige. The Commerce Development Research Institute (2012) estimated with an annual growth rate of 4.2%, the market for international apparel brands will increase from the USD 1.1 trillion in 2007 to USD 1.4 trillion by 2015. The fashion sector can be broken down into: haute couture (very prestigious articles, accessible to a chosen few, often hand-made and tailor-made for special occasions), prêt-à-porter (deriving from the democratization of haute couture and referring to articles that can be worn in every-day life), diffusion (the secondary lines of leading stylists, addressing a broader public), bridge (more accessible and functional creations) and finally, the mass market (firms specialized in selling fashion items at low cost to a very broad public) (Cillo et al., 2010). This last mass-market group includes the fast fashion companies ZARA, H&M and Gap, which combine a focus on fashion with accessible prices. ZARA gave the fashion apparel industry a major shock by adopting its fast fashion development model and many international brands such as Uniqlo, H&M, and the GAP are following suit. ZARA has been dubbed the "Dell Computer of the fashion industry" by US magazine Business Week and "the brand with the most research value in Europe" by the Harvard

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Business School. Many business schools, including the Wharton School of the University of Pennsylvania and the IESE Business School of Spain, consider ZARA an example for future manufacturing. Louis Vuitton fashion director Daniel Piette described ZARA as "possibly the most innovative and devastating retailer in the world", and Gucci Group CEO Robert Polet admitted that they should closely observe and learn from ZARA, as consumers are being deeply educated by ZARA to look forward to fast and instant fashion (Chen et al., 2007). By combining rapid processes with a short time to market and the creation of an original brand that is distinctive and immediately recognizable, these companies have filled important positions even in fashion related sectors (Liz & Gaynor, 2010).

To complement the various links in a manufacturing supply chain and deal with the entrance of the textile industry into the consumer era of fast fashion, the Industrial Development Bureau of the Ministry of Economic Affairs in Taiwan combined the technical prowess from the Industrial Technology Research Institute, the Taiwan Textile Research Institute, the Taiwan Textile Federation, and the Footwear and Recreation Technology Institute in order to establish five creation bases for clothing and apparel. One of these five bases, the Fashion Institute of Taipei (FIT), launched an operation at the site of the Taipei Costume and Culture Center reserved by the Taipei City government in May, 2011. Chairperson of Armani China, Stephanie Wen, was invited to serve as general counsel in the hopes of duplicating and surpassing the Dongdaemun Market model in South Korea. The plan was to integrate the industrial chain and concatenating design with the manufacturing chain. One objective was to assist new designers operating without distribution channels, resources, or information related to proofing as well as OEMs. Another objective was to provide ancillary resources such as mannequins, design software, and equipment for pattern making, sewing, and cutting. This facilitated the transition of the clothing and apparel industry and assisted manufacturers in the development of differentiated products to satisfy market demand. This increased the value of the clothing industry and reactivated traditional garment districts.

The main goal of this study was to obtain insights that can contribute to theoretical and practical discussions on how the FIT builds competitiveness through service innovation. This paper also attempts to construct new forms of service innovation analytical model that reflect the highly dynamic nature of the fast fashion industry. In short, in order to fill the above research gaps in the literature, it would be interesting to study local institute service innovations in an increasingly global economy. Two research purposes are thus addressed in this paper: 1) to analyze the service gaps of traditional apparel retailers in Taiwan, and 2) to develop service innovation models for the fast fashion industry based on service experience engineering (SEE) methodology to spur the economic development of local apparel industry clusters.

2. LITERATURE REVIEW

2.1 Developments and trends of the apparel industry

Prior to the mid-1980s, the model used in the fashion industry was to sell large quantities of standardized clothing. In those days, the time point of predicting consumer needs and fashion trends was significantly far from the time point when the clothes were actually sold. In the late 1980s, since consumer awareness with regard to fashion began increasing, the fashion industry began incorporating the concept of quick response (QR) to increase the accuracy of trend prediction and reduce lead times. In addition, manufacturing was outsourced to lower manufacturing costs (Tyler et al., 2006). The QR strategy gradually took over, thereby resulting in the fast fashion retailer industry. With QR as the core objective, the supply chain was vertically integrated with the emphasis placed on cooperation, open communication, and trust among suppliers and manufacturers. The goal was to enhance efficiency and flexibility in adapting to the demand-driven market (Grete et al., 2003). Fast fashion could refer to the style of emerging products, an operation model, or sector of the apparel industry. Similar terms include "speed to market" and "McFashion". Fast fashion retailers draw inspiration from the finery found on fashion runways, and improvements in the supply chain accelerate the design and manufacturing

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processes. In this way, retailers can sell highly customized products and increase inventory turnover by manufacturing smaller batches. The following list shows many of the major trends currently affecting the global textile and apparel industry: China dominates apparel and textiles; high-tech and smart fabrics proliferate; supply chain management (SCM) is evolving to serve the global market; discount clothing retailers see promise in designer lines; haute couture designers experience; conflicts over costs and control; mass designers and retailers speed up for fast fashion; European strategies force U.S. department stores to rethink their business models, etc. (Choi & Powell, 2005).

Monitoring the supply chain and reducing time to market are sustained by innovative IT processes that make it possible to follow the product in all its movements. Information and Communications Technology (ICT) is absolutely essential to manage the enormous quantity of data and information that circulates between the various company departments, as well as between partner companies (Liz & Gaynor, 2010). Aggressive retailers also employ apps to enhance brand recognition or provide sharing mechanisms to leverage social networks. Other apps actually convert any cell phone into a storefront, enabling consumers to shop anywhere at any time (Commerce Development Research Institute, 2012). The Japanese retailer Uniqlo published the electronic 2011 Fall and Winter Catalog and three desktops apps that could be downloaded for free: Uniqlo Calendar, Uniqlo Clock, and Uniqlo Look. The GAP launched the iPhone Style Mixer, which enables consumers to experiment with different clothing combinations, create personalized shopping lists, access information on audio and video products, purchase products, and locate the nearest GAP store.

In the 1980s, downstream manufacturers in the Taiwanese textile industry began relocating abroad. Between 2001 and 2011, the output value of the clothing and apparel industry declined yearly, from NTD 67.1 billion in 2001 to NTD 25.3 billion in 2011. After 2001, midstream and upstream firms in the textile industry were threatened by emerging markets (such as Mainland China and India). To avoid competition in mass production and pricing, the Taiwanese industry began developing specialty fibers (such as microfibers, cross-section fibers, and nano composite fibers), which ushered in a differentiation transition stage. In 2011, the output value of the textile products had risen to NTD 460.8 billion, with the scope of the entire textile industry reaching NTD 500.8 billion upstream to downstream (Executive Yuan, 2012). More recently, Taiwan has made investments in research and development, becoming an important supply center for functional and industrial textile products (Chou et al, 2011). The Taiwanese apparel industry has a number of advantages with regard to quality and manufacturing efficiency that can assist in the development of self-brands. The growth in the Asian market will enable Taiwan to make use of its cultural advantages and location to spur the development of Taiwanese brands (Commerce Development Research Institute, 2012).

2.2 Service, service science and service design

Buell (1984) defined service as any means used in sales as well as any activities, benefits, or satisfactions provided in coordination with the sale of goods. Busch & Houston (1985) proposed that service involves the behavior of an individual or an organization for the benefit of other individuals or organizations. Gustafsson and Johnson (2002) claimed that service is the activities of interaction between customers and service employees or the products, resources, or systems of service providers, the objective of which is to solve problems for customers. Service has four characteristics: intangibility, inseparability, perishability, and heterogeneity (Lovelock, 2001; Zeithaml, 1985; Parasuraman, Zeithaml, & Berry, 1985; Kotler, 2006). Moritz (2005) defined service design as the design of full service experiences as well as programs and strategies for the sake of providing services.

The growth of the service sector is changing the nature of the organization, and it is becoming apparent that there is a lack of research and knowledge in service with most academics working within a manufacturing rather than a service paradigm (Spohrer and Maglio, 2008). Initial research in service science derives from SSMED, which is short for Service Science, Management, Engineering and Design. This emerging discipline advocates an interdisciplinary approach to the study, design, and implementation of service systems, which are complex systems composed of specific arrangements of people and technologies that take

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actions to provide value for others. As one might expect, extant research in SSMED has focused on the description of core problems and has outlined concepts behind the phenomena of service science (see for example, Maglio et al., 2006; Chesbrough & Spohrer, 2006; Spohrer et al., 2007; IfM & IBM, 2008). This is because it is through shared problems and concepts that foundations for interdisciplinary research are built. IfM & IBM's (2008) report 'Succeeding through Service Innovation' set out the following recommendations for researchers intending to formulate service innovation action plans: to develop an interdisciplinary and intercultural approach to service research; to build bridges between disciplines through grand research challenges; to establish "service system" and "value proposition" as foundational concepts; to work with practitioners to create data sets to understand the nature and behavior of service systems and to create modeling and simulation tools for service systems. SSMED also has been extensively addressed for supply chain services. William (2008) explores the nature of service phenomena, the processes of value creation, and adds various contextual elements to elaborate the notion of a service value chain.

Service design is concerned with systematically applying design methodology and principles to the design of services. At the same time, service design integrates the possibilities and means to perform a service with the desired qualities, within the economic and strategic intent of an organization (Holmlid & Evenson, 2008). Service design from our perspective assumes the customer/user as the starting point or lens into a specific service and then models how the service can be performed by means of using creative, human-centered and user-participatory methods. Service design activities appear throughout a service development process (see e.g., Scheuing, 1989; Gronroos, 1990; Edvardsson et. al, 2000). In our approach to designing for service innovation, we integrate these activities across a service development process that includes exploratory, generative, and evaluative research that spans the entire design process — from discovery to release (Evenson, 2005). In Hsiao's (2008) model, addressing service experience engineering (SEE) methodology for developing new services, SEE describes the new service development framework completely from idea creation to service market-launch. It divides the new service development into three phases: (1) FIND, including consumer demand survey and technology observing research; (2) InnovationNet, including the two research focuses on specific service-related industrial value chain and service modeling; and (3) Design Lab, including PoC (Proof of Concept), PoS (Proof of Service) and PoB (Proof of Business). SEE methodology is concrete and easy to follow for those engaging for the first time in service design. In Taiwan, the SEE model has been employed to lead to innovation in people's daily work for more than thirty leading companies, including the industries of manufactures, automobile, freight forwarding, food retailers, information service, pharmacy, supplementary education, tourism, and information communication technology, etc.

2.3 Quality Function Deployment

Quality function deployment (QFD) was conceived in Japan in the late 1960s and Akao first presented its concept and method during this time (Akao and Mazur, 2003). QFD has since then been widely used as a technique for performing the translation of customer requirements into design requirements (Gharakhani & Eslami, 2012). Researchers, such as Akao (1990), Clausing (1994) , Hauser and Clausing (1988), Prasad (2000), Reich and Levy (2004), Raharjo et al. (2006) and Hanumaiah et al. (2006), have also outlined the QFD approach. A significant number of successful QFD applications in the service sector have been reported in such areas as education (Koksal and Egitman, 1998; Lam and Zhao, 1998), technical libraries and information services (Chin et al., 2001), public sector (Gerst, 2004), e-banking (Gonzalez et al., 2004), spectator events (Enriquez et al., 2004), and hospitality (Stuart & Tax, 1996). QFD is a technique used in many fields to proactively develop products and improve quality (Tan & Shen, 2000). The QFD technique investigates customer requirements in intensive detail and enables organizations to outperform their market competitors with effective competitive strategies.

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3. METHODOLOGY

3.1 Research Design

A case study is "an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and the context are not clearly evident. It allows the investigation to retain the holistic and meaningful characteristics of real-life events—such as individual life cycles, organizational and managerial processes, neighborhood change, international relations, and the maturation of industries" (Yin, 1994: 3). Case-study methodology has the unique strength of being able to deal with a full variety of evidence—documents, artifacts, interviews, and observations. Although multiple-case design requires more resources compared to a single-case design, its major advantage is its ability to generate more compelling evidence and more robust research outcomes (Yin, 1994: 45). Exploratory case study is used to explore those situations in which the intervention being evaluated has no clear, single set of outcomes (Yin, 2003). The field interviews targeted the CEO, directors, and managers, and took a holistic view (Yin, 1994: 41). Following replication logic in selecting cases for the study, we then employed an analytic induction approach to building explanations over the phenomena we observed by stipulating a set of causal linkages among the targeted research constructs (Yin, 1994: 110).

This study relies on two primary data sources: archives and interviews. Interviews were conducted with internal and external informants to obtain comprehensive perspectives. Respondents were identified through face-to-face meetings, telephone calls and follow-up e-mails. We guided the informants through the key innovation activities starting with idea generation and ending with industrial and governmental suggestions. Industry experts were interviewed as an independent resource to verify innovation activities. A literature review was undertaken to facilitate the mapping of the history, trajectory, structure and competition of the industries, and focused interviews were used to generate detailed insights into innovation activities of selected firms in the target sectors. We complemented our interview data with a wide range of archival and observational data that included financial statements, annual reports, internal documents, industry databases and publications, websites, and other secondary survey analysis in the case companies.

3.2 Service Experience Engineering Approach

This study adopted the SEE approach as a tool to identify service gaps that are likely to be overlooked by creation bases for fast fashion and then to propose ways to effectively deal with them. In this manner, we can develop innovative services more suited to service targets. Figure 1 displays the framework of the SEE method (Hsiao et al., 2010), which systematically compiles all of the relevant issues that must be faced during the development of innovative services as well as the available methods, tools, and models. FIND focuses primarily on trend research from the aspects of both consumer and environment. The Innovation Net concentrates on the industrial value chain and service modeling. Design Lab focuses on the proof of concept (PoC) and the proof of service (PoS), and the feasibility of the proof of business (PoB). This study focuses on the industrial value chain and service modeling in the Innovation Net stage with regard to creation bases for fast fashion. In the first phase, we adopted the service value network for analysis, which involves a specific type of service whose participants are defined before a graph of the network is drawn based on the relationships and interdependencies among them. Using the network graph and a service issue array, we then identified the service gaps that may occur in the current system, which then served as reference for proposing improvements. The second phase was service modeling, the primary research tools of which were service experience insights and service design. The latter is a specifically developed service model. Necessary information related to trends, the environment, industries, and users were integrated before undergoing meta-analysis with the ideas generated by the researcher in brainstorming. Service designs and planning decisions were then made, completing the design of the service model that served as the basis of subsequent implementation.

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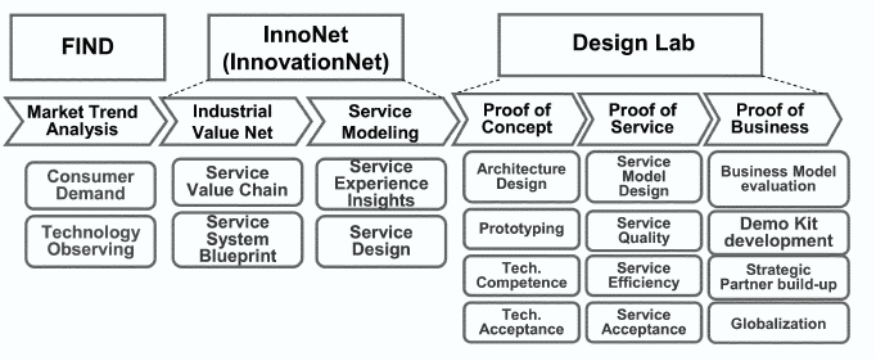
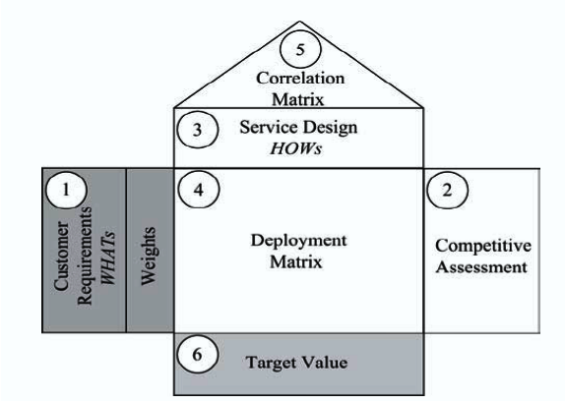


Source: Hsiao, Shu-Ling; Yang, Heng-Li (2010)
Figure 1. Framework of service experience engineering approach

3.3 Quality Function Deployment Process

We also applied the QFD technique because the FIT has launched in the early stages of the design phase and so that we could incorporate the customer's needs into the new services. Furthermore QFD can be used as a planning tool as it identifies the most important areas in which the effort should be focused in relation to our technical capabilities. QFD will be reviewed in order to understand how it works, to highlight its strengths and weaknesses and to discuss its practical applications (Jaiswal, 2012). In terms of methodology QFD is applied through a set of matrices, with the first and the most commonly used matrix being the house of quality (HOQ) (Andronikidis, 2009). The typical structure for HOQ consists of four matrices (Figure 2): these matrices translate customer requirement into design characteristics (house 1); design characteristics into specific components (house 2); specific components into production process (house 3); and production process into quality plan (house 4). The ranking of the competitors' products can also be performed by technical and customer benchmarking.



Source: Gharakhani & Eslami (2012)
Figure 2. House of quality

4. CASE STUDIES

The Fashion Institute of Taipei (FIT) is situated at No. 9, Sec. 2, Xiyuan Rd. in the Wanhua District of Taipei City. Formerly the Taipei Costume and Culture Center, it was established on May 27, 2011, by the Industrial Development Bureau of the Ministry of Economic Affairs (MOEA) and four institutes, including the Taiwan Textile Federation. The FIT declared three mission statements: (1) to integrate the functional advantages of the Monga apparel district with local characteristics, assist the industry in developing connections to local life, and persuade the near-six-hundred clothing wholesalers nearby to place orders with manufacturers in the vicinity to make the declining Monga business district into a center for popular clothing in Asia; (2) to revitalize traditional apparel industry clusters and accumulate peripheral resources for sales, subsidiary materials for clothing, and processing and production, assist designers to progress towards self-brands, and form an industry with small production runs but high diversity using the creation space and quick response (QR) production responses established by the

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creation base, and shape a research and development base for the Asian Pacific clothing and apparel industry; and (3) to integrate the creation base with local culture and business circles, cooperate with new designers, promote development in the fashion design industry, elevate industry standards, and upgrade the structural transition of the apparel industry.

The first floor of the creation base contains fashion design shops. At present, 25 stores are located there, with 80% selling clothing products, 15% selling accessories, and 5% selling other types of cultural and creative goods. The second floor hosts a mobile working platform for designers and a QR fashion and design creation platform. More than 50 designers are stationed there: 48% of the alliance designers are engaged in managing personal brands, whereas the remaining 52% provide industry design services. The third floor hosts a multi-function exhibition space where exhibitions and activities are held. With over 50 years of history, the Monga apparel district is the oldest wholesale distribution center for apparel in Taiwan. Under the commercial revitalization program, the Monga apparel district received counseling from the Department of Commerce of the Ministry of Economic Affairs. The Monga Business District Association was established and organizers were honored with the award of first place in the national performance appraisal of business districts. Nonetheless, changing times have left the entire district in a state of decline.

5. RESEARCH FINDINGS AND DISCUSSION

5.1 Analysis of apparel industry value chain

The industry value chain of the apparel industry comprises raw material suppliers, processors and manufacturers, distribution channels, and customers or clients. The upstream portion of the chain includes design, research and development, and equipment innovation, whereas the midstream portion involves manufacturing and production. The downstream portion includes activities such as logistics, marketing, and branding. Appelbaum & Gereffi (1994) divided the apparel industry chain into five major networks: the raw material network, the component network, the production network, the export network, and the marketing network. The raw material network comprises suppliers of natural and synthetic fibers, and the component network contains textile factories and companies that process the raw materials into fabrics; the production network is made up of clothing factories and their domestic and overseas subcontractors, the export network includes various trade intermediaries, and finally the marketing network contains various retailers. Innovation in the apparel industry value chain primarily involves the conversion of individual production processes into a full package service, which changes the relationships between buyers and suppliers to provide suppliers with greater autonomy and more opportunities to create and learn (UNIDO, 2003). The creation base investigated in this study straddles the production network, the export network, and the marketing network in the industry chain described above. The industry service network, including the apparel creation base, is outlined in Figure 3.

This study used the service issue matrix and service network to understand the value chain among parties in the apparel industry and to analyze service gaps. The following service gaps in the current apparel industry were identified:

1. Strengthening of Taiwanese apparel brands to expand independent channel services in the overseas market;
2. Demand for green clothing combining functionality and environmental protection;
3. Shopping services integrating smart mobile devices with the internet;
4. Demand for brand apparel of high quality at reasonable prices;
5. Demand for brand clothing with cultural and creative design concepts;
6. Lack of design skills in the application of fabrics.

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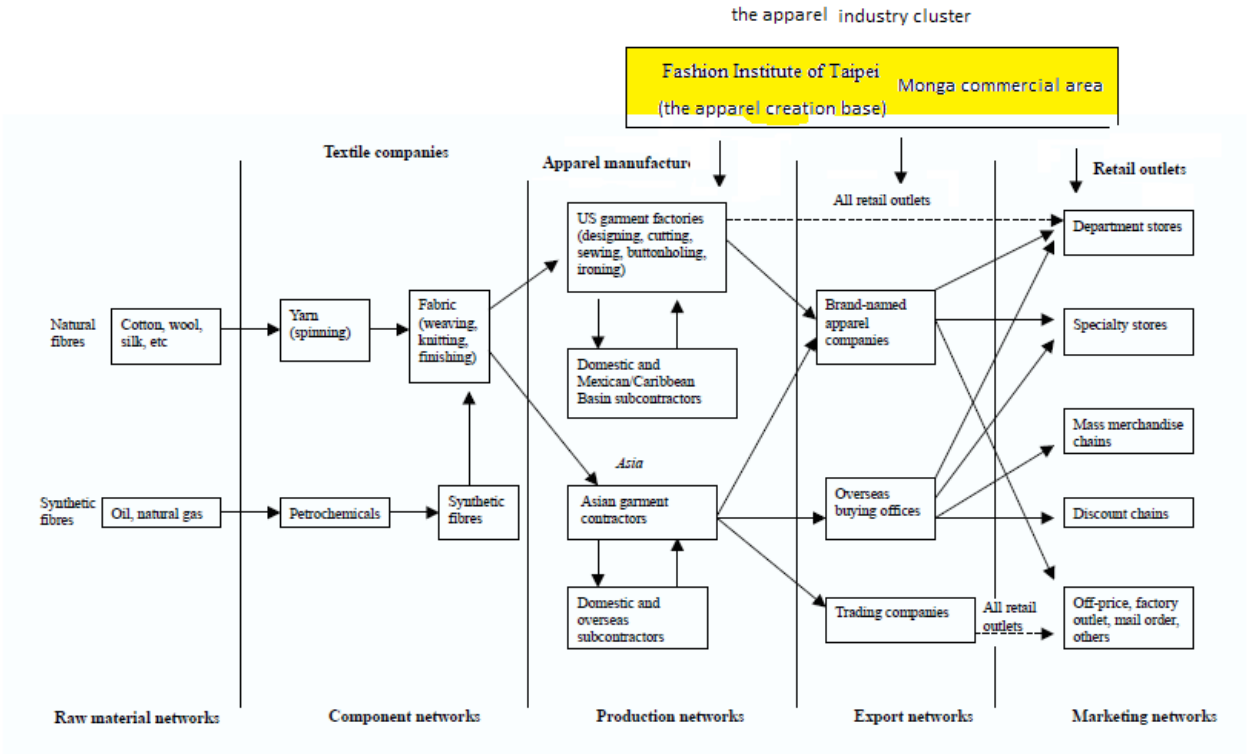

Source: Revised from Appelbaum and Gereffi (1994)
Figure 3. Service network of the apparel industry

5.2 User Demand and Current Services at the Fashion Institute of Taipei

In this section, we outline the current services provided by the FIT and the demands of retailers in the Monga apparel district for a service function deployment matrix. The factors obtained were added to the service deployment matrix. Based on interviews with experts, in-depth interviews with businesses and the literature review, we compiled the user demands and current services, as presented in Table 1.

5.3 Quality function deployment graph

After determining the service demands of businesses in the Monga apparel district and the services currently being provided, we compiled this information into a service function deployment graph and designed corresponding service products. The HOQ has been used to translate requirements of the prospective informants into the service to be offered in the organization. Based on the degree of correlation between the services and demand, we assigned to the service products coefficients of 9, 3, 1, and 0, with 9 representing high correlation, 3 representing moderate correlation, 1 indicating low correlation, and 0 meaning no correlation. Correlation coefficients were denoted using spaces and listed in the table. Based on the degree of importance that the creation base attached to the resources invested in the services, we assigned coefficients ranging from 1 to 5 for self-evaluation. This enabled service providers to assess their own competitiveness, forming the right portion of the service function deployment graph. This graph (Figure 4) provides an instrument to evaluate service

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innovation in the creation base. Columns are divided into the descriptions of services provided, user demand, and the self-evaluation items for the service providers.

5.4 Potential Service Innovations

Creating the model of service products enabled us to analyze, discuss, and improve the service products and identify the service experience thresholds. In Figure 3, we presented the service items in which users perceive discrepancies. The service innovation items of the creation base are as follows:

1. Cultivating local (Monga area) designers;
2. Assisting designers to develop apparel merged with local Monga culture;
3. Holding events such as business matching meets and industry seminars in which designers actively participate to improve themselves;
4. Promoting cooperation between local wholesale retailers and international ODMs and proofing centers;
5. Integrating entrepreneurial investment funds and assisting designers in entrepreneurial endeavors and developing their own brands and channels;
6. Matching designers that have their own apparel brands with sales channels in the Monga business district; matching designers with Monga businesses to promote mass production and combining the economic benefits of business clusters with sales channels in the business district;
7. Strengthening the service functions of the Fashion ICT Integrated Service Platform: establishing an online shopping mall for the Monga apparel district, incorporating mobile commerce, holding real and virtual integrated marketing activities, and enabling online pre-ordering and onsite bidding events;
8. Entering international exhibitions with apparel products that have local features; forming delegations from the business district could participate in exhibitions to establish overseas channels (e.g., Taiwan trade fairs in Mainland China);
9. Offering advanced training courses in subjects such as brand management, strategic marketing management, channel development and evaluation, and industry innovation management;
10. Co-hosting fairs with regional universities, senior high schools, local associations;
11. Arranging exchange and observation activities with other apparel districts and OEMs and developing tourism activities in the business district in conjunction with local religious cultures;
12. Integrating academic resources, engaging in academia-industry cooperation in Taipei City, establishing pattern authorization databases, and incorporating Eastern cultures into clothing design;
13. Cooperating with the local business district association in applying for counseling resources for industries with local characteristics, thereby achieving the goal of long-term autonomy in the creation base; obtaining information from Ximending regarding the fashion needs of young consumers.

This study summarized five major constructs for service innovation at the creation base: (1) organizational innovation, which makes use of cultivation mechanisms in conjunction with design, production, and sales functions to achieve the goals of both autonomous operation and cultivation of local designers through advanced training courses; (2) new service concepts, incorporating funds to assist designers in developing their own brands and channels, that develop apparel with local creativity and include tourist experience activities; (3) client interface innovation, which involves developing overseas exhibition channels and co-hosting visits between international commercial districts as well as integrated marketing events with real and virtual channels; (4) technological innovation to strengthen ICT integrated service platforms and mobile commerce; and (5) internet innovation to connect online resources from the government, local associations, and schools, combining local business district networks as well as using the economic benefits of business clusters in conjunction with international ODMs.

In addition to considering themselves as creators of apparel, managers of the creation base are also the providers of fast fashion design services. They should endeavor to achieve autonomous operation and make use of information and communication technologies to construct a service platform, expand client interfaces for overseas markets, and combine external

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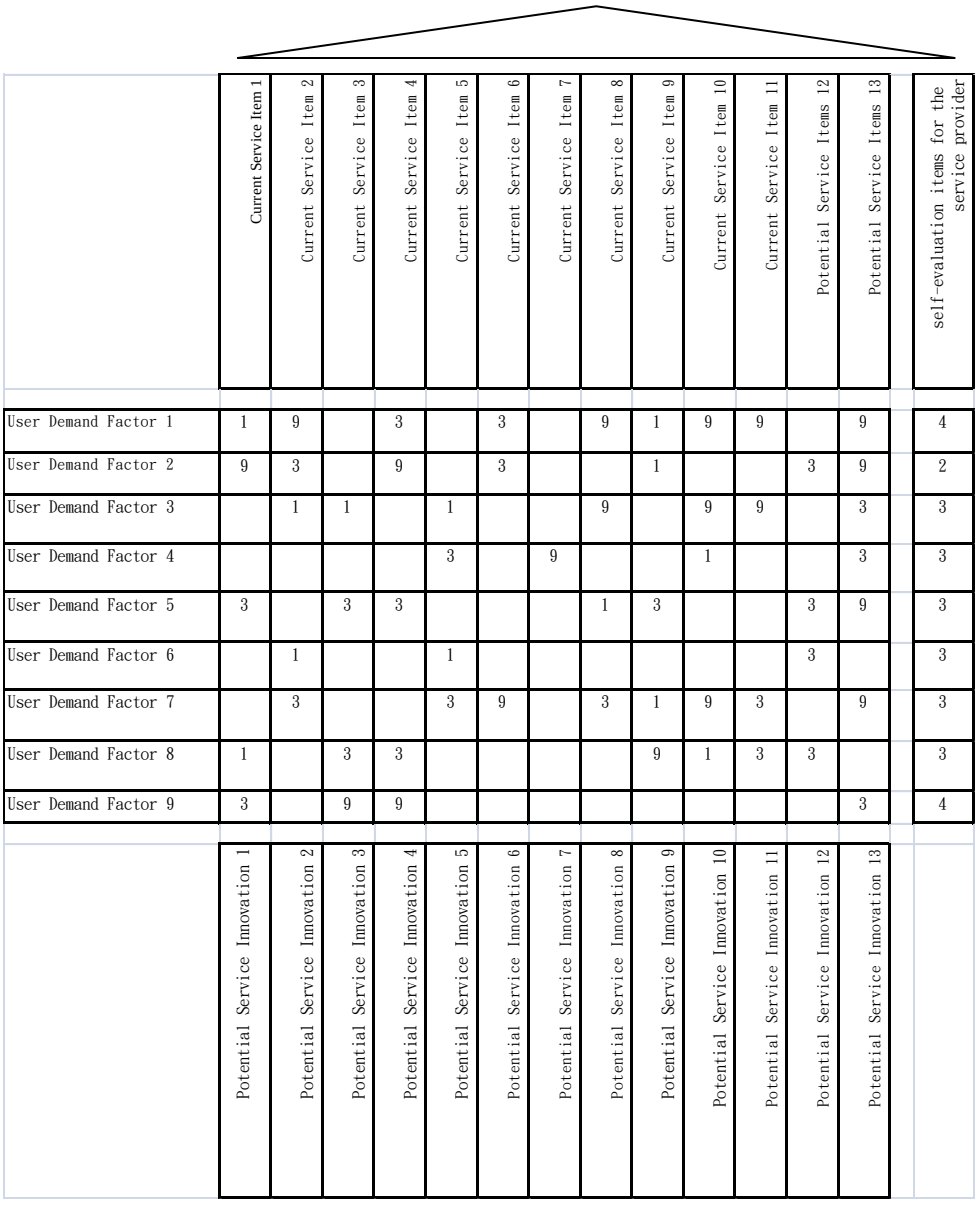
network resources to switch their orientation from production to service in accordance with the spirit of service experience design.



	Current Service Item 1	Current Service Item 2	Current Service Item 3	Current Service Item 4	Current Service Item 5	Current Service Item 6	Current Service Item 7	Current Service Item 8	Current Service Item 9	Current Service Item 10	Current Service Item 11	Potential Service Items 12	Potential Service Items 13	self-evaluation items for the service provider
User Demand Factor 1	1	9		3		3		9	1	9	9		9	4
User Demand Factor 2	9	3		9		3			1			3	9	2
User Demand Factor 3		1	1		1			9		9	9		3	3
User Demand Factor 4					3		9			1			3	3
User Demand Factor 5	3		3	3				1	3			3	9	3
User Demand Factor 6		1			1							3		3
User Demand Factor 7		3			3	9		3	1	9	3		9	3
User Demand Factor 8	1		3	3					9	1	3	3		3
User Demand Factor 9	3		9	9									3	4
	Potential Service Innovation 1	Potential Service Innovation 2	Potential Service Innovation 3	Potential Service Innovation 4	Potential Service Innovation 5	Potential Service Innovation 6	Potential Service Innovation 7	Potential Service Innovation 8	Potential Service Innovation 9	Potential Service Innovation 10	Potential Service Innovation 11	Potential Service Innovation 12	Potential Service Innovation 13	

Figure 4. Quality Function Deployment Graph

6. CONCLUSION

This study introduced the SEE approach and QFD technique to understand the demand and current provision of services in the apparel industry of Taiwan. We conducted in-depth analysis of the needs of businesses in one apparel district and then made suggestions for improving the original services as well as proposing completely new services. We outlined the industry value chain to clearly

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understand the interdependence among the businesses in the apparel industry and defined the process of service delivery and the relationships among the businesses. We then identified relevant service issues and systematically analyzed the schisms and gaps existing in current services, or pain points of the users. This study revealed the service activities currently provided by the FIT and identified service gaps. Service experience insight and in-depth interviews were used to determine potential service demand and behavioral patterns among the businesses in the Monga apparel district. After identifying the demands, current services, potential services, and the relationships among competitors, we then determined the service experience thresholds. Finally, we assembled five constructs and thirteen service experience thresholds as the most crucial content of service innovation.

Unlike previous qualitative studies using only interviews or observations to collect data, this study employed the SEE method as a research instrument. This systematic approach enabled the identification of critical service items from the aspects of supply and demand. Our aim was to understand the R&D process of new service models used by a creation base for fast fashion. This study provides a concrete starting point for those wishing to apply systematic service engineering to customer behavior, and the study results can serve as reference for future researchers. The findings of this study can not only assist academics to identify important service design issues, but also enable current students to find employment and enhance their competitiveness.

Future research could extend on the scope of this study to other apparel districts and other industries. The content of the service demand could also be converted into a quantitative questionnaire on service quality to calculate the weights of various demand factors and evaluation constructs as well as derive the relationships between constructs. Comparative analyses could also be conducted on the service innovation items presented in this study and the service innovation dimensions proposed by Hertog (2010).

Table 1 Factors related to user demand and services provided by the FIT

Category	Factor	Description
User Demands	**1. Application in the Monga apparel district, which is rich in local culture and creativity**	It is hoped that by incorporating elements of local culture into the design of clothing and by integrating the business district with a fashionable and cultural environment, Monga culture can be revitalized as a cultural experience and a shopping area, capable of attracting consumers and tourists.
	2. Assistance for businesses in obtaining government subsidies for modeling shops and counseling resources	It is hoped that the Monga Business District Association will receive more government resources to create model stores, provide counseling, allow businesses to try out and experience new service models, to assist businesses to create design innovation, and to increase business opportunities.
	3. Events to increase exposure and the scope of participation among businesses in the apparel district	It is hoped that marketing activities will enhance participation in the district and provide exposure.
	4. Information and communications technologies such as internet marketing to expand markets	It is hoped that the service functions of the current Fashion ICT Integrated Service Platform can be strengthened by adding raw material suppliers in Luzhou, Sanchong, Banqiao, and Xinzhuang to the e-service system, developing ERP common modules for clients in the Keelung, Taoyuan, and Yilan areas, and providing cloud services such as image file transmission.
	5. Comprehensive counseling program to guide the district towards internationalization	Honorary president Chi-feng Hong of the Monga Business District Association hopes for a comprehensive counseling program to promote the continued development of the district and guide it towards internationalization, unlike stage-by-stage programs that have no later developments once completed. In addition, he hopes that the traditional garment businesses in the Monga apparent district can be reborn as a valuable creative service industry.
	6. Coordination with cultural developments of the Taipei City government to create an innovative life community	Businesses in the district also hope that cultural development resources can be incorporated to create an innovative life community.
	7. Integrating the business district with local religious festivals to develop tourism	President of the Monga Business District Association Wen-he Hong hopes that the apparel culture of the district can be combined with the annual festival at Wanhua Qingshan Temple and the water lantern festival at Longshan Temple. Such widespread publicity will assist the Monga apparel district in developing into a tourism business district with the appeal of religious events.
	8. Developing a younger market and cooperation with FIT to provide apprentices with learning and development opportunities	An official of the Monga Business District Association described how the shop owners and their employees in the district are almost like family. In the development of the district, it is a common sight to see employees open their own stores. The majority of the stores currently in the district originated from areas in the south of Taipei, and business owners hope that their next generation can coexist and flourish with the district. Young women with sewing skills are particularly needed in the apparel industry, and if apprentices could team up, they might feel a stronger connection to the area.
	9. Search for ODM production orders from large brands	In addition to making use of their own connections in the business network, businesses can also seek to cooperate with famous brands and receive ODM production orders.

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Category	Factor	Description
Current Service Items	**1. Establishing resources for design and production**	This includes cultivating Taiwanese design talent, soliciting fabrics made in Taiwan (MIT), connecting to proofing centers, test workshops, and MIT clothing factories, and assisting in the development and mass production of design products.
	2. Assisting designers in creating their own brands and products	This involves connecting energy resources and channels of the FIT, assisting designers in developing products and brands, and increasing product revenue and brand awareness.
	3. Matching apparel design cases	This includes matching designers to manufacturer needs and assisting businesses in conducting market analysis, fashion positioning, merchandise planning, style design, pattern design, and marketing promotion.
	4. Assisting apparel design to production matching	This involves assisting designers in developing their own styles and assisting in production mechanisms such as connecting proofing centers to complete the design of mass production merchandise.
	5. Creating proprietary channels to assist in the marketing of apparel products designed in Taiwan	This involves the use of channel management such as image displays and sales promotion activities to expand the sale of brand products.
	6. Establishing physical channels	This includes consignments at short-term department store counters and boutiques to expand the consumer market in Taiwan.
	7. Establishing virtual internet channels	This includes the use of online shopping malls and TV shopping networks to diversify channels and accelerate commodity circulation.
	8. Holding ordering events for clothing	This involves assisting designers, industry, and businesses in distributing apparel products among market channels.
	9. Offering training courses	This involves holding courses such as fashion seminars and design conferences and providing training related to fashion, textiles, and marketing.
	10. Promotional fashion design events	This includes promotional activities associated with fashion design, such as press conferences, performances, program recording, and competitive exhibitions among designers, photographers, and the media.
	11. Marketing promotion events in the business district	This involves integrating local resources such as the apparel district and industrial manufacturers to hold MIT fairs, presentations for new apparel products in the district, and transnational design conferences.
Potential Service Items	**12. Matching academic resources and promoting cooperation between academia and industry**	This includes promoting opportunities for cooperation between academia and investing resources in relevant research.
	13. Disseminating to the industry information and resources related to counseling provided by the government	This involves providing the Ministry of Economic Affairs and the Taipei City government with relevant resource handbooks and consultation services and updating this information to build relationships with district businesses.

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