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Co-design: a novel approach to create value-added products in the creative fashion industry

Abstract

Additional value creation is a critical characteristic of innovative products. Co-design is regarded as an effective approach to creating additional experience value through customer engagement in the product development process. It does not only benefit the comprehension of customer desires but also the inspiration for creating and increasing customer loyalty. However, some barriers may exist in value-creation chains in many creative industries, such as the designer-driven product design, forecast-based marketing, homogeneity of products, long product and development cycles, mass production and so forth. As a typical creation-intensive industry, the fashion industry is focused on in this paper to be surveyed in terms of practices of co-design. This paper has analysed the co-design practices in the fashion industry in terms of market research, design model and manufacturing. Several practitioners who implement co-design strategy in fashion product development have been observed and analysed from the perspective of the value creation chain. The study result demonstrates that customer involvement, co-creating design method, collaborative product development mechanism are the essential aspects of the implementation of co-design in the fashion industry. The significance of this study is not only to offer an effective approach for the fashion industry to survive in increasingly competitive markets but also to point out the developing direction of the relative creative industries. In the conclusion, the paper suggests that further studies related to co-design need to be addressed and would primarily concern themes about the various additional values for innovative products and services and mass customization in creative industries.

Keywords: co-design, value-added, fashion, product

Volume 7 Issue 4 - 2021

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Received: July 28, 2021 | **Published:** August 16, 2021

Introduction

Background

Companies that intend to be leaders in an industry should have the capability to create breakthrough products to differentiate themselves from the competitors based on the consistent maintenance of competitive advantage. Breakthrough products are products that can create new markets or refine existing ones to support enjoyable experiences in using and create a fantastic lifestyle for the customers and contribute to the increase of profit for the producers simultaneously.[1] A successful company always hinges on the capability of product development.

Breakthrough products have different meanings in different eras and industrial fields. During the industrialization period of most of the 20th century, the form and function of products as the essential aspects of product development were generally determined by style and technology. Product development often connoted product styling and technical innovation and application. Given the limitations of technologies and production, what consumers desired and whether their desires could be fulfilled usually relied on levels of technical development and the productivity of manufacturing. These situations introduced a production-oriented model of product development normally described as *form follows function*. In that production-oriented context, the companies who held advanced technologies or were able to provide meaningful styles of products could often occupy the leading positions in certain industries.[1]

Coming into the 21st century, the mere enablers of technological innovation and/or meaningful style are no longer sufficient to create competitive products, successful products increasingly need to connect with customer values. Along with the increasing diversification of the social cultures, globalization of economics and rapid development of technologies, the manufacturing and service industries have been suffering enormous challenges in the past two or three decades.[1,2] With the growth of customer awareness of products or services through information technologies such as the internet, today people are no longer satisfied in passively accepting the products and services with predictable styles and fundamental functions, they also desire enjoyable experiences in product usage. Thus, beyond the style and technology, the value of products connected with customer wants and needs has become an increasingly important dimension for evaluating the competitive potential of products. In addition, globalization of economics has been aggravating competition in the manufacturing industries. Companies implementing price-based competition strategies have been losing their advantage due to increasing international out-sourcing. They need to shift their product development strategy from price-based to customer value-based.[1,2] Furthermore, the rapid development of technologies has also created situations and opportunities for innovations in product, development process, manufacturing and marketing models. According to the case study conducted by Cagan and Vogel,[1] in the current era value-based innovation, combined with the integration of style and technology instead of the mere style- or technology-based innovation, has become a dominant product development strategy in many leading companies across different industries. In summary, in the post-industrial era, the environment derived from the current socio-cultural trends, economic forces and technological advances is calling for a customer-oriented value-based product development strategy to propel the competitive advantages of companies.[1]

The same is true in the fashion industry for the emphasis on added value to products or services. Along with the increasing diversification of the social culture, globalization of economics and rapid development of technology, the fashion industry has faced enormous challenges in the past two or three decades because of the increasing sophistication of customer awareness, individualization of customer needs and wants,[3] maturation and saturation of marketplace, increasing global competition, unpredictable fashion trends,[4] low-tech apparel industry,[5] labour-intensive manufacturing and impact of information technology.[6] The traditional fashion product development model which has been dominated by the designer based on fashion trend forecasts has proved to be no longer adaptable in the increasingly turbulent fashion industrial environment. Co-design as a novel approach to product development has emerged in this creative fashion industry.[7,8]

Problem

Co-design refers to 'the creativity of designers and people (customer) not trained in design working together in the design development process'.[9] Co-design is a new product design process through which prospective customers can be involved in product development. Co-design can not only suggest to the producer a deeper insight into the target consumers but also create a fantastic experience for the customers to gain the satisfaction of creative self-fulfilment.[8] With a possibility to create new value both to customer and producer, besides supporting the fashion product development, co-design might also be developed as an independent product (service) from the perspective of the concept of the breakthrough product defined by Cagan and Vogel.[1]

Even though a few practitioners and academics have been exploring co-design in the different industrial areas, the fashion industry still needs to address questions about what co-design means in respect of value creation in the fashion industry, how and to what extent co-design can be applied in the fashion value chain, what premises are needed to support co-designing in the fashion industry and what the promise of co-design is in the future.

Method

To address the issues mentioned above, this paper aims to conduct a case study about co-design in the fashion industry, based on observation and documentary research methods, within the theoretical context of creating breakthrough products. The finding of the research will contribute to the knowledge about the application of co-design in the traditional mature fashion industry and the theory of creating breakthrough products.

The following sections firstly offer a literature review about the theory of creating breakthrough products and co-design and several questions that existed in the literature are indicated. After a case study is detailed focusing on co-design applied in the fashion industry for the purposes of creating added value and in order to retain competitive advantage. Then the findings are discussed with an emphasis on the performance of co-design in value creation. Finally, a conclusion of the study and recommendation for further research is suggested.

Literature review

Creating breakthrough products

The term breakthrough product was firstly introduced by Cagan and Vogel[10] in their work.

Creating breakthrough products: Innovation from Product Planning to Program Approval. Breakthrough products are defined as products that can create new markets or refine existing ones to support enjoyable experience in using and create a fantastic lifestyle for the customers and simultaneously produce higher profit for the producers. In comparison to common products, breakthrough products emphasize the creation of values of products based on the integration of style and technology. According to Cagan and Vogel,[1] creating breakthrough products pays more attention to value creation added on products rather than just considering style for form and technology for the function of products. By shifting from product-oriented to customer-oriented design, creating breakthrough products should adhere to the principle that the form and function of products must fulfil a higher value state rather than one that the form follows function. Therefore identifying and creating product values is a crucial issue to work on in the creation of breakthrough products.

For the successful creation of breakthrough products, two main phases in the product development process are shown as follows[1]:

a. To identify product value opportunities based on the understanding of customer desires

b. To develop the product's form and features according to the definition of the product concepts.

Identifying product value, as the first phase in the process of breakthrough product development, carries out identification of the value of products to help to form the product concepts, while the second phase, product development, works on designing the concrete forms and functions of products connecting with the previously identified values relating to customer desires.

Identification of product opportunities concerns several factors in three main areas: Social trends (S), Economic forces (E) and Technological advances (T).[1] The social factors focus on culture and social interaction and including family and work, health issues, use of computers and the Internet, political environments, successful products in other fields, sports and recreation, sporting events, the entertainment industries, vacation environments, books, magazines, music, environments at work. The economic factors focus on real or perceived excess income that gives people purchasing power. The Technology factors focus on direct and imagined results from new scientific discoveries in corporate, military, and university research and the implied capabilities stemming from that research.

Value positioning map

Style and technology are crucial factors to separately determine the forms and functions of products. However the principle of creating breakthrough products is based on the proposition that *form follows function* is not enough for creating breakthrough products and to create added value to the products according to the customer requirements.[1] Competitive products always differentiate themselves from others through distinctive styles and functions which build particular values that incentivise customer purchasing. Values of a product can often be assessed by customers based on the product form and function which are normally articulated by style and technology respectively. Style refers to the sensory elements which often relate to aesthetic tastes and social culture and expresses particular meanings in certain forms of product. Technology generally refers to the feature and performance of products that closely concern product structure and functions corresponding to human factors. Products can be categorized into four different types according to the amount of style and technology elements that are used to constitute the product value structure.[1] They include the cost-driven product, style-driven product, tech-driven unrefined style product and the breakthrough product. Therefore, product development needs to first identify the

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value position of the product, then design the form and function of the product through appropriate style and technology based on social, economic and technological situations.

According to Cagan and Vogel,[1] good product styles usually satisfy customer aesthetic tastes in shape and appearance and create physical and psychological comfort in using. Advanced technologies can support the core functions of the products resulting in the enhanced performance and utility of the product and the methods and materials which are used to produce the products. So the essential issue of the product technology entails the function of the product around which technological factors normally concern the selection of material, production method, the feature of products and interaction between user and product when the product is used. Perfect products should be easy, comfortable and safe to use with practical functions which consumer's desire. Value of products can be understood as the level of effect which customers expect to gain and the experience from products and services that normally reflect social lifestyle, enabling features and perfect ergonomics, resulting ultimately in useful, useable and desirable products or services.[1]

From the perspective of value, product development is a process in which the product style and technology are designed and integrated to create one or more values that fulfil the customer needs and wants and that would merit the customer purchasing the product. A product is a physical carrier of value to be created for the customer to experience and consume the values while the producer realizes the economic benefits.

Category of products

To evaluate the breakthrough products, a value positioning map (Figure 1) was introduced by Cagan and Vogel[1] as a tool for categorizing products according to their aspects of style versus technology. The value positioning map includes four quadrants which are divided by two orthogonal axes representing style and technology separately. Along the horizontal technology axis from left to right, the technology level ranges from low to high. Oppositely, along the vertical style axis from low to high, the style level varies from low to high.

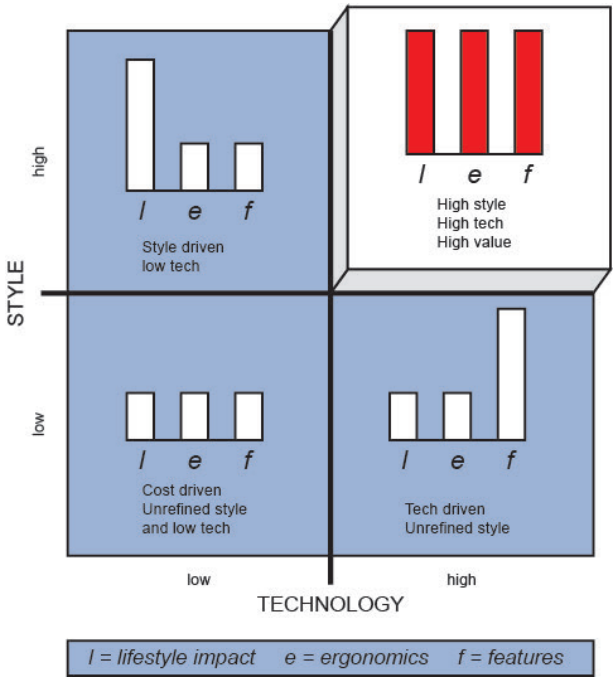

Figure 1 Positioning Map of style versus technology through value.[1]

In the value positioning map, the lower left quadrant represents common products that are designed with minimal styling and mature technology. These products normally belong to the commodities that fulfil the mass daily consumption of people with basic function and less styling. Mass marketing with low prices are the core values of these products so that these kinds of products are often produced in scales with minimal consumption of material, time and labour to gain low cost and mass production efficiency. Low price is the essential competitive principal for these products.

Products in the lower right quadrant represent products that are low use of style and high use of technology. These products generally have a technological advantage based on the innovation in material, technology or feature. With the monopolistic competitive advantage in novel material, technology or feature of the product, these products are often developed with maximization of the feature but ignoring the style and ergonomics to capture the markets as quickly as possible. These kinds of products often heavily rely on breakthrough innovation in material or technology, thus they normally need large investment and a long development cycle and face the possible threats coming from the competitors who have similar technology but the better style in aesthetics or ergonomics.

Products placed in the upper left quadrant are products with high use of style and low use of technology. These products often emphasize the aesthetic shape and appearance with a lack of feature of products or sacrificing the human factors such as ergonomics. Being easy to copy and retailing in fleeting markets, these products often have short life cycles and need to change quickly and continually.

The products positioned in the upper right are thought of as the breakthrough products that integrate style and technology effectively to create high value. These products generally combine innovative technology, perfect style with good aesthetic shape and appearance or ergonomic feature. Based on the integration of high styling, technology and value, these products often have a strong competitive advantage and relatively stable consistent markets.

Even though various products can be categorized into the different quadrants in the value positioning map, these value positions of products are always dynamic because of the consistent changes in Social trends (S), Economic forces (E) and Technological advances (T). The different quadrants can also be used to represent the different periods of a product life cycle. A product may be launched into the market with the perfect style, advancing technology initially. Then they can be refined to move to the upper right quadrant as breakthrough products. The breakthrough products might also fail to progress, losing their competitive advantage and moving into the lower left quadrant even declining and disappearing in the market at last.

Value opportunity

Traditionally, innovation of products is normally worked on in a style-oriented or technology-oriented way according to consumer desire, the feature of product and technology development. In this case, the product development method always focuses on the basic aspects of the products including style and technology. Differently, breakthrough products are often created through high stylings such as fashionable shape or fantastic appearance or high technology with competitive advantages in new material, advanced technology and high-performance based on the different context of social culture, economic state and technological level. Different integrations of style and technology can form various product values driving customer purchasing because the values can fulfil the customer needs and wants.

Through the analysis of value opportunities of products, various value propositions based on the different needs and wants of

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customers can be identified and classified to help the development of breakthrough products. The value opportunities can be categorized as emotion, aesthetics, product identity, impact, ergonomics, core technology and quality.[1] Based on the attributes of form and function of products that rely on style and technology situations, different kinds of the value proposition of products can be identified and created and then translated into certain product concepts. The product concepts are used to conduct the development of the breakthrough products.

Co-design in the fashion industry

Fashion products, such as clothing, are normally traditional products that are generally low-tech and labour-intensive.[5] Some barriers such as designer-driven product design, forecast-based marketing, homogeneity of products, long product and development cycles, mass production etc. may exist in value-creation chains in many fashion industries. What value can be assigned to fashion products and how to create high value in traditional fashion products are the emerging issues for the contemporary fashion industry.

To identify or create value to fashion products, co-design as a customer-centred design approach has been thought of as an effective strategy to achieve the purpose. Co-design is defined as the collective creativity of designer and customer (not trained in design) and their cooperation in the design development process.[9] Through the participation of customers in the fuzzy front end[1] of the design process, qualitative research of the customer can be carried on through co-designing. In this way, the desire of the customer representing related value can be identified or created and translated into a certain form and function of product which is supported by fundamental style and technology.

Differentiating from the traditional forecast-based designer-oriented fashion design approach, breakthrough product development through co-designing normally includes analysis of value opportunity, generation of the product concept, identification of product form and function and design of product style and technology. Thus, the co-design process mainly connects with customer research, product development and marketing, etc.[11,12] According to the different desires of customers and the situation of technologies, product value creation can be achieved at different points along the value chain.[9] For example, the co-design for fashion apparel development can be manipulated at the post-purchase, the point-of-sale, the process of making, the section of design and customer research back through the whole value-creating chain.[13]

With different levels of professional knowledge or skill, customers participating in co-design can play different roles in the process. Based on levels of creativity, Sanders and Stappers[9] classify the customers into four types: doing, adapting, making and creating (Table 1). Meeting these various requirements need different levels of technologies and knowledge. For different positions in the process of co-design, the roles customer can play range from the pure user to professional designer. For instance, customers as pure users can work on different tasks based on the multiple functions of a smartphone rather than only distant dialogue. However, many IKEA furniture products can be assembled at home by customers themselves through standardized components of products with shared interfaces. People can also play a designer to enter into some activities of design competition or business crowdsourcing to enjoy the creating experience.

According to the literature review above, it is obvious that identification and/or creation of perceptible value is the key issue to the development of breakthrough products. The core value of a product should respond exactly to the needs and wants of customers. For accurately understanding the customer desires, co-design can be used as an effective approach to gain deep insight into prospective customers and often used to identify and create product added values. However, as a traditional mature industry and along with the slow development of manufacturing technology, the fashion industry still belongs to a low-tech and labour-intensive manufacturing sector. Co-design as an external cooperation between the producer and untrained customer provides the opportunity to break out of the closed company internal value creation loop, even though efficient communication between the producer and customer might prove problematic in real life. Thus, searching for the values of fashion products related to customer requirements and determining how they can be exploited through a co-design approach for the development of breakthrough products are both significant issues that need deep investigation.

Table 1 Four levels of creativity[9]

Level	Type	Motivated by	Purpose	Example
4	Creating	Inspiration	'express my creativity'	Dreaming up a new dish
3	Making	Asserting my ability or skill	'make with my own hands'	Cooking with a recipe
2	Adapting	Appropriation	'make things my own'	Embellishing a ready-made meal
1	Doing	Productivity	'getting something done'	Organising my herbs and spices

Case study

Outside of academia, co-design has also been practised in the fashion industry for two or three decades. Integrating style and technology, different forms of co-design in the process of development of fashion apparel have been trialled to identify or create various values which can benefit both the customer and company. The following looks at several typical cases of the practice of co-design in fashion apparel development to see what and how values can be created through the co-design approach in this low-tech and labour-intensive industry.

Co-design through convertible clothing

To propel the flexibility of clothing, some fashion brands develop and launch convertible clothing to the markets. These kinds of garments can be worn in multiple ways due to their particular structure. Even though the garment has a certain structure it can be worn in different ways relying on the softness feature of the fabrics and particular structure to form various shapes. Through the flexibility in wearing, this particular kind of garment enables recreation by the user to construct various shapes which look like different styles from just one piece of clothing. This co-design in the wearing of clothing

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can be exemplified by a kind of cosy dress that was marketed by the fashion brand DKNY around 2004. This kind of cosy dress was asserted as the twelve gifts for Mother Day (Figure 2). They can be worn in twelve ways through which related twelve styles can be created according to individual customer preferences. This multi-wearability of the convertible clothing not only satisfies the desire of the price-sensitive customers but also provide opportunities for the customers to experience the redesign of their images through one piece of clothing.

Figure 2 Convertible clothing launched by DKNY around 2004.[14]

Co-design for garment making

Besides the multi-style dresses, value creation can also be achieved in the section of garment-making through particular technology. Some fashion brands provide point-of-sale co-design to create added value to the clothing.[2] A wonderful example is the revolutionary fashion collection namely A-POC (A Piece of Cloth) what was launched by Issey Miyake cooperating with engineer Dai Dujiwara in 1999.[15]

The range of A-POC is made beginning with a single thread in the result of a whole piece of cloth which is consisted of sets of finished clothing (Figure 3). The particular structure of clothing constructed by each thread controlled by the computer creates clothing with a high degree of variants but pre-modelled. The A-POC can be exhibited simply as a long tube of jerseys on a flatform and cut and shaped by customers themselves according to their preferences. Based on this novel technology, the customers can not only experience the processes of garment style design and final product making with the happiness of self-achievement but also gain the customizable service on the various individual garment styles.

As Issey Miyake said 'people are waiting for something that is fun which they feel that we can create together'. With this identification of a value opportunity gap, the A-POC was developed based on particular technologies. The simple final parts of manipulation for the whole garment making are left for the customer to self-tailor and complete with the fantastic experience of enjoying it. The success of A-POC in the business can be attributed to the accurate value positioning, innovative design and advanced technology.

Co-design for mass customizing

Furthermore, co-design is one of the primary approaches to achieve mass customization strategy in the fashion industry because garment customizing cannot be realized without the engagement of customers in the process of fashion apparel development.[2,17] In order to create distinctive looks, fashion apparels always need to be customized in terms of type, style and specification. Since the early twenty-first century, there have been some online-based clothing customization companies emerging. For example, the IC3D company offered an online jeans customization service (Figure 4). Through the online bespoke platform, consumers can select different types and styles of jeans based on the jeans product and parts families. Some design details such as fabric, shape, fly, packages and thread, etc. can be selected by the consumer through visual illustration and text description. Furthermore, the customizing system can support the customer to input personal sizes to tailor the jeans measurement. Based on the jeans modules in terms of style and specification, customers can select the enabling style elements to identify the completed shapes and appearances then decide to make an order. The modularized jeans components with a variety of combinations not only create customizing value to customers but also can help the producer to retain similar efficiency of mass production.

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Figure 3 A-POC (A Piece of Clothing).[16]

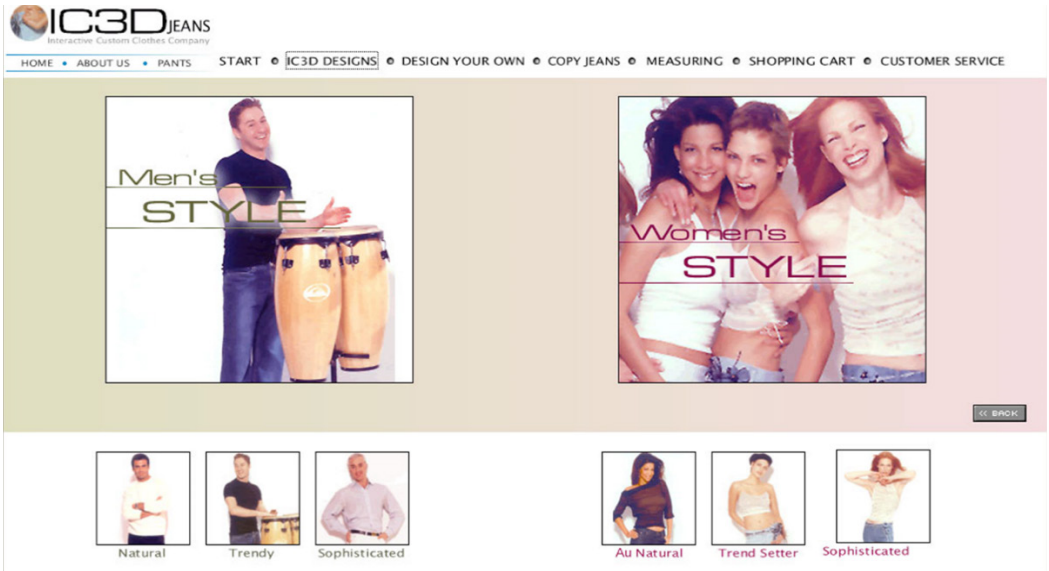

Figure 4 IC3D Website for jeans customization online.

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Co-design for crowdsourcing

Co-design can not only be used in the development of products but also the inspiration of design ideas through crowdsourcing. The concept of crowdsourcing was coined by Jeff Howe[18] it describes an emerging business model introducing consumer democracy. As Howe described, Jake Nickell and Jacob DeHart built up a company namely Threadless in 2000. This online-based company deals in T-shirts which are designed with particular printed graphics all coming from the customers. Customers would submit designs for a cool T-shirt and vote on which one is best. The winner could get T-shirts for free and all the others should pay for the purchase of the shirt. To successfully fulfil the desire for youthful idealism and creative passion, Threadless grew up quickly and became a great business success.[18] Similarly, crowdsourcing was used by Derek Lam in 2011 to promote his fashion company's products and brands. To cooperate with eBay, Derek Lam presented sixteen dresses online asking for public votes on the most favourite ones. More than 100,000 prospective customers voted and more than 20,000 indicated that they expected to be informed when the dresses could be available. The top five dresses became the real collections launched on eBay subsequently.[7] Through crowdsourcing, the customer's desire for participation in the design process can be fulfilled, on the other hand, the company can also benefit from collective intelligence and accurate information about customers' preferences.

Results of the study

The results in these case studies above demonstrate that co-design is an effective approach to the engagement of the customer in value creation at different points along the value chain for the development of breakthrough products. The convertible dresses can provide a multi-wearable performance for the customer to enjoy in the redesigning experience through post-purchase customer adjustments. The co-designing process can also be experienced during the final making section normally at the point-of-sale through the semi-manufactured products such as the A-POCs which enable individual customization. Furthermore, customers can be involved in the product design through an online-based mass customization platform. Besides product development, co-design for crowdsourcing can not only benefit the company to develop novel products and the promotion of customers' brand loyalty but also fulfil the customers' passion.

The practices for co-design in the fashion industry also suggest that successful co-design relies on the innovation of technologies including manufacturing and information technologies. For co-design, manufacturers should offer appropriate channels and toolkits to make the process of value creation available for untrained customers to participate in. Co-design can be used to create added values including product identity, quality, ergonomics, emotion and impact to products and services with results in raising customer satisfaction, the quality of the products and services and promoting the creative ability of the companies.

Conclusion and recommendation

Facing the challenges of diversifying social cultures, globalizing economics and rapidly developing technologies, the traditional fashion industry needs to transform design development strategy from product-centred to customer-centred. The value of products or services connected closely with customers' needs and wants is the core to develop breakthrough products or services. Co-design is one of the effective drivers that through the collaboration of producer and customer enables the identification and/or creation of new values. The results of academic research and practices in co-design demonstrated that co-design can be employed in the identification of customer desires, creation of value, development of products or services, innovation of technology and marketing model to propel the degree of customer satisfaction and competitive advantage of the manufacturer. The traditional matured industries such as the fashion industry still have a promising future through consistent value creation, with a combination of integration of style and technology, based on the co-design approach.

However, it needs to pay close attention to ensure that the implementation of co-design entails the collaboration of internal functional sections relating to market research, product design, manufacturing, marketing and distribution, etc., it needs further significant studies about the potential role of collaboration in value creation, product style design and technology innovation. Furthermore, as the emergence and creation of novel value are primary determined by the social trends, economic forces and technological advances, different value propositions might conflict with each other, further research might be needed to explore a criteria system for evaluation of various value positionings to promote the quality of creation of values.

Acknowledgments

None.

Funding

Supported by the funding of research institutes of leather and footwear industry of Wenzhou.

Conflicts of interest

The authors have no conflict of interest regarding this paper.

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