Mass Matching
Customization, Configuration & Creativity

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Implementation of i-Fashion

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Abstract. i-Fashion in Korea is aiming at ubiquitous and personal fashion world through digital convergence in IT and Fashion industry. Vision of i-fashion is creation of i-Fashion market and industry to provide more values with new digital services, seeking what customers want. i-Fashion Technology Center has supported pilot projects of 16 fashion enterprises to deploy business intended by i-Fashion in cooperation with the Korean government, the Seoul Metropolitan City, Konkuk University, the KITECH, the KAIST and several other universities. The individual corporation is able to gain the support of a professional technology IT system, production facilities, and specialists within i-Fashion Technology Center. Therefore, corporations are able to operate their business model within the center, and will support them if they regard their business model as worthy. Several on-line shopping malls and digital shops have implemented i-Fashion with digital shopping assistance services including 3D avatar, virtual try-on, virtual fitting, etc. and custom-made apparel goods on demands including dress shirts, T-shirts, men’s suit, ladies dress, uniforms, glove, bedding, etc.

Keywords. i-Fashion, 3D avatar, mass customization, virtual try-on, 3D scanner
Introduction

Recently, the fashion industries have changed into knowledge-creation industries of intensive high values through the upgrading and differentiation of designs, brand marketing, utilization of hi-tech materials, the development of advanced functions, and so on. Especially, 3D body scan service and size customization have increased like Landsend (US), Levis (US), Brooks Brothers (US), Bodymetrics (UK), Corpus (German), Samson (France), etc. In Korea, internet apparel market with about 2.5 billion US$ is currently the largest one and still growing up.

'i-Fashion' is paying careful attention to the creation of new value added processes; by linking some different IT approaches with existing development methods. The letter 'i' from i-Fashion emphasizes the 'IT' component of the company, and represents our commitment to 'customer-oriented fashion, utilizing IT technologies'. i-Fashion is seeking to create a new knowledge-intensive value added process not previously seen in fashion, and is doing so using IT-related technologies, such as a 3D body scanner, 3D avatar (cyber digital body), virtual try-on, virtual fitting, RFID (radio frequency identification) communication, DID (digital information display), and DTP (digital textile printing), etc.

Firstly, the two keywords identified by i-Fashion are 'Ubiquitous' and 'Personalization' - both symbols of paradigm changes. They have both been individually applied to the fashion industry to create added value in the provision of such things as 'Digital Service' and 'Mass Customization'.

The Korean i-Fashion industry has world-class technology, with a globally unique commercial model. We have now entered the commercialization stage, the stage beyond technology development, and are implementing pilot projects for commercialization in cooperation with a number of corporations.

Background – Fashion in future

3D Avatar

In the near future most people will have their own digital bodies which include the size and body form information. Customer can easily reach the 3D human scan center with 3D whole body, hand, foot and head scanners and measure his/her sizes. Also, using the 3D avatar generated from the 3D modeling and visualization, she can get the proper clothing size recommendation and analyze her body from
cross sectional comparison between shapes before-and-after diet or me and a standard model. We call this 3D avatar ‘Virtual Myself’ and ‘Virtual Me’ generated from 3D body scan with undressed and dressed, respectively.

A customer not to reach the human scan center can easily generate her 3D avatar (‘Virtual Twin’) from her basic inputs with age, gender, height and weight. Firstly, the i-Fashion system automatically recommends her basic 3D avatar and she can modify its shape with maximum 10 size manual measurements including girth of waist, girth of hip, girth of thigh, length of arms, length of legs, etc., using the fine tuning tool provided by the i-Fashion system. **Virtual Character** is a 3D avatar to be no skin off my body.

Once her avatar is stored into the i-Fashion server, she can load it at every shopping spot including internet shopping malls, road shops, department stores, etc. Finally, her 3D avatar becomes ubiquitous digital contents like money, voice, music, movie, etc. Figure 1 shows various 3D scanners and avatars.

![Figure 1. 3D human scanners and 3D avatars.](image)

**Future shopping**

Digital shopping will be realized soon (Figure 2). Using a smart card or a RFID chip or an USB memory stick, customer can load her 3D avatar. And using electronic catalogue, she can select her favorite dress and order it using magic
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mirror (DID) with virtual try-on. If want, she can change its details like textiles, sleeve, pocket and collar types, etc. as well as size fit.

Internet and mobile shopping is same as the above. Anyone is able to easily try on and buy clothes using mobile phones and computers. Especially, a digital camera of a mobile phone is used as a recognizer of 2D bar code for a suit of clothes. Shopper can buy family’s clothes through virtual coordination and fitting system without accompanying her kids and husband. All of tries are stored in the i-Fashion server and used for customer relationship management (CRM).

Figure 2. Future ubiquitous shopping.

Digital fashion contents

A suit of clothes will generate a new value as digital fashion contents in 3D cyber world including on-line game, social network service (SNS) and interactive animation as well as an article of commercial product.

Especially, mobile, internet, and digital TV enable us to use the digital fashion content to represent her and to prepare a present of a suit to someone. The contents are also very useful for personal electronic catalogue.
New values of i-Fashion

Existing clothing retailers worldwide are competing with brands, marketing, new materials and design. But what i-Fashion has done is create two new values like ‘digital shopping assistance service’ and ‘mass customization’. Korea has been aggressively supporting information technology development that would make everyday life more efficient and convenient through the country’s so called "ubiquitous" information technology infrastructure. Ideally, everyday activities would be possible with the push of a button. The digital shopping assistance service is expected to expand rapidly, while researchers will continue to advance the system with strong support from the government.

i-Fashion’s differentiation and competitive edge in comparison to existing stores and i-malls is its service in providing custom tailored clothes combined with special value added service. Especially, Korea hopes to invigorate cyber shopping and boost on-line sales.

Ubiquitous + Fashion = Digital Shopping Assistance Service

In ubiquitous shopping era, customer will buy clothes through various distribution channels including internet (e-Commerce), mobile (t-Commerce), and D-TV (t-Commerce) as well as digital stores. Especially, shoppers reluctant to buy clothes on-line because of doubts over the fit, color, design and quality of the items may soon change their minds. To purchase an item on i-Fashion, shoppers would create a 3D avatar. The digital shopping assistance service enables a shopper to try on any item in the virtual shop and get it custom-fit (Figure 3).
Virtual i-Fashion shops could help clothing makers move into value added, custom clothes more effectively by receiving on-line orders, improving the competitiveness of clothing manufacturers. People with access to the body measurements of their friends or relatives could conveniently buy clothes as gifts without worrying about how well they would fit. The virtual shop can also be accessed through mobile phones.

Such innovative sales systems could be created since Korea has one of the most advanced and extensive IT networks in the world. Clothing companies can also create digital catalogues, virtual mirrors, mannequins and advanced RFID systems. It is expected i-Fashion could create a lot of new consumer-oriented businesses.

**Personalization + Fashion = Mass Customization**

When ‘personalization’ meets ‘fashion’, it creates a new value ‘mass customization’. Many industries have moved into multi-kind small production including SPA (specialty retailer of private label apparel) and fast fashion brands from mass production, and will be changed to mass customization soon. Mass customization in fashion is truly consumer-oriented and customized on-demand mass production as shown in Figure 4.
To purchase mass customized garments, a customer can select what she wants among many options like textiles, details, color, length, etc. as far as mass production can be possible. Options are provided by fashion experts following the trend. A customer can design his or her own styles through numerous combinations of optional preferences. Also, through the use of precise body measurements and personalized avatars, a shopper can select fit clothes that she can put on in a virtual environment. Figure 4 shows an electronic catalogue and various clothes with different textiles and types of sleeve and neckline at an actual store. Using 3D modeling, virtual reality, and display technologies, a shopper can get visual confirmation of what she wants using an electronic catalogue to select her preferences and virtual try-on with virtual coordination and fitting system.

The most important thing for mass customization is how to set up the economic and efficient manufacturing process. Korean special manufacturing infra structure that two or four workers produce a piece of garment enables i-Fashion to lead mass customization in fashion industry and will be one of successful model. Also, MTM (made-to-measure) systems developed by several research institutes with apparel companies are very useful for customized on-demand mass production.
Pilot tests and commercial applications of i-Fashion

i-Fashion Technology Center has constructed the test beds and supported pilot tests to deploy new fashion business model intended by i-Fashion in cooperation with IT companies as well as government associations, international collaboration partners and institutes as follows;

- 14 apparel companies: Kolon (No.2), Samsung Fashion (No.1), etc.
- 2 Distribution companies: Shinsege (No.1) and CJ(No.5)
- 9 IT companies: i-Omni, D&M FT, SK (No.1), Samsung (No.1), etc.
- 7 International bodies: [TC]², TNO, MVM, Intellifit, Animetrics, etc.

※ ( ) refers Korean company ranking from market share.

The individual corporation is able to gain the support of a professional technology IT system, production facilities, and specialists within i-Fashion Technology Center. Therefore, corporations are able to operate their business model within the center, and will support them if they regard their business model as worthy.

i-Fashion systems have been successfully showed at several exhibitions including SPESA Expo 2007 in Miami, US since first demonstration of i-Fashion’s concept at the department store in Korea in 2005. i-Fashion Technology Center has tried to commercialize the systems for ‘digital shopping assistance service’ with several leading Korean fashion and distribution companies firstly in the world. Now, it is just an early stage. It has been continuously applied to actual stores (Figure 5) as well as an on-line shopping mall as shown in Figure 6.
Figure 5. Actual i-Fashion store.

Figure 6: Actual i-Fashion internet shopping malls.
i-Fashion has applied mass customization system to several items like dress shirts, T-shirts using digital textile printing (DTP), men’s suit, lady’s dress, golf wear, golf glove, shoes, and beddings in Korea and will expand the business items. The appropriate price of customized garments on-demand shall be determined at the market. i-Fashion expects the increase in price is 20-40% of the ready-made garments considering the rapid decrease of inventory drop and customers’ need for representing their personality. Figure 7 shows mass customization on-line and off-line stores.

Figure 7: An actual i-Fashion store and an internet shopping mall.
Summary

i-Fashion’s goal is to create the new values of clothes ‘Digital Shopping Assistance Service’ and ‘Mass Customization’ into existing values like brand, design, material, etc. Digital convergence with IT and fashion enables us to create a new blue ocean market. Clothes might be differentiated with two new values in the near future.

Through the efficient collaboration with government associations, IT and apparel/distributing companies, institutes, and universities, i-Fashion Technology Center has supported the successful pilot tests and implemented several commercial systems. Enterprises reduce the risk for new business models and the costs for construction of a test bed. i-Fashion hope that this new concept be expanded world widely. And we helps apparel and fashion industries be moved into actually customer oriented and new value added.

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References