Artificial Intelligence and Big Data Environment Clothing Design Innovation Ability Promote Study

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Abstract. From 2020 to 2025, the market value of artificial intelligence in the clothing sector will reach US $47 billion to US $300 billion, a 600% improvement rate, according to a study by the world Internet center. When it comes to the best developing industry in the future, artificial intelligence and big data will be regarded as the best developing business opportunities. The purpose of this paper is to explore how to improve the connotation and attractiveness of the clothing design industry and stimulate more potential of clothing consumption under the excellent business environment. The research of this paper is based on the creation status of domestic fashion designers and makes full use of artificial intelligence technology to design and construct effective customer preference data, which is based on data and supports the creation inspiration of design. The research results of this paper show that in the process of clothing design, users' preference data should be combined to dig out design innovation points. Only by classifying the sources of inspiration and providing theoretical basis for design through in-depth research on dimensional visualization, can the inspiration of fashion design innovation be inspired.

Keywords: Artificial Intelligence, Costume Design, Clothing Consumption Potential, Inspiration for Costume Creation

1. Introduction

Today, with the rapid development of Internet economy, the traditional fashion design concept has suffered unprecedented impact and challenges, and the fashion design industry is also facing the research and development stage that must change from perceptual intelligence to active application intelligence [1]. In recent years, big data and artificial intelligence have promoted the self-innovation of traditional clothing design and the transformation towards digitalization and technology [2]. In such a new industry background, there are higher requirements for the big data collection and design management of clothing enterprises [3]. However, how to cope with the innovation and reform
requirements of clothing design brought by the era of big data and artificial intelligence has become a major challenge for the development of the industry [4].

At present, apparel design enterprises at home and abroad have started to add apparel design into personal intelligent customized design services. It is a problem that must be faced to combine apparel design with artificial intelligence to select design schemes based on the big data management information of customers [5]. For apparel design enterprises, the collection of customer preliminary data, the design inspiration and the creation of design sketches are still confined to the traditional design mode, and the demand information generated by big data cannot be directly connected with the design data [6]. Low design efficiency in the early stage, lack of inspiration, and inability to integrate customer preference data into the design are the main shortcomings in the current fashion design innovation process [7]. In the rapidly developing Internet economic environment, new design and management modes emerge one after another. How to use the new technologies of the new era to help fashion design innovate and produce, and how to output design products with commercial value is a major problem that needs to be solved in the current fashion design innovation research [8].

The research of this paper is based on the current status of clothing design, combines with real and effective customer preference data to customize the creative source of clothing designers, and USES the in-depth research of form and dimension visualization to provide theoretical basis for design [9]. According to the obtained user survey data and demand analysis report, the design value positioning target is identified, the functional structure of the design is determined, and the path to improve the innovation ability of clothing design is discussed through the design practice process [10].

2. Method

2.1. Fashion Trend Leads Design Innovation

For a long time, trends were defined by trendsetters in the places where fashion originated. After entering the Internet information age, with the globalization of the market economy and the continuous development of information technology, we have learned that the right to define the fashion trend of clothing among the current successful mass clothing brands is gradually transferring from the trend guide in the fashion birthplace to the aesthetic level and consumer demand of the public.

China's economic level has been improved in the process of global integration. In the stage of mastering the actual trend of fashion and the effective design of products, it is the breakthrough point to break through the innovation of clothing design to learn the product design elements and design rules of the trend of fashion and how enterprises fit the information with products quickly and accurately.

2.2. Intelligent Design Method

Under the environment of artificial intelligence and big data, the personalized service of clothing design can be summarized as two service directions of intelligent auxiliary design and intelligent collocation design, which is also the aspect that clothing designers try to innovate at the current stage.

Intelligent assistant design is by the customer according to their favorite free choice of clothing
fabrics, clothing style and color, and then by the designer to complete the clothing design, the design process, customers can own preferences for local or overall dressing. Guangdong's astar intelligent technology co., for example, has tailored its customers' data from the Internet in real time. The company has built its own human body data model library and version data modeling, and realized remote online data collection. All the data from product ordering, raw material selection, intelligent tailor processing to final finished product delivery are connected.

Intelligent collocation design is one of the most convenient and rapid design methods applied to consumers. It mainly lets customers find their favorite fashion clothes with the help of virtual collocation function. With the help of artificial intelligence simulation technology and big data matching body features, customers only need to add their favorite clothes on the shopping platform to try on, and get the best matching style recommendations.

3. Experiment

3.1. Experimental Objectives

The deep understanding of users and the creation of products for users to enjoy the experience is an important way to design success. Therefore, before the architecture system, the corresponding research should be carried out for the design. Preliminary understanding of the theoretical construction related to the system, on the basis of the relevant personnel for inquiry and research, research on the target users should first formulate the research content.

3.2. Sources of Experimental Data

The main source of questionnaire collection: staff of the design department of sundry west, registered fashion designers of zhihu, fashion design forum post bar and students majoring in fashion design, etc., mainly from existing staff, cooperating with freelancers and students, and distributing questionnaires offline and online. 65 sets of questionnaires were collected from online clothing designers through the questionnaire star to ensure that each respondent could complete the questionnaire in a serious and high-quality manner.

3.3. Experimental Implementation

The questionnaire survey of fashion designers is conducted in the form of interviews with the purpose of obtaining more useful information. The questions asked are mainly from the designer's own characteristics, work classification and state, the extraction of auxiliary tools.

4. Discuss

4.1. Analysis of Questionnaire Survey Results

(1) Information extraction of working characteristics

The investigation results of the field with the most time consumption in the process of costume design are shown in figure 1. It can be seen from the figure that in the process of costume design, designers spend a lot of time on the preparatory work in the early stage, but these time consumption
provides convenience for the smooth development of the design work in the later stage.

![Pie chart showing the most time-consuming part in costume design](image)

**Figure 1.** Time consumption of each link in costume design

The investigation on the source of inspiration of designers' clothing design is shown in table 1. It can be found from the table that when designers design clothes, the most inspiration comes from fashion exhibition, followed by the interpretation of the popular trend spread on the Internet. It can be seen that fashion designers tend to rely on the contents they have observed for the design of clothing works.

| Source of inspiration     | Sample size | Proportion  |
|---------------------------|-------------|-------------|
| Customer demand           | 21          | 32.31%      |
| Fashion show              | 45          | 69.23%      |
| Fashion weekly            | 27          | 41.54%      |
| Trending websites         | 37          | 56.92%      |
| Film and television       | 18          | 27.69%      |
| Nature                    | 9           | 13.85%      |
| Tourism                   | 8           | 12.31%      |
| Other                     | 18          | 27.69%      |
(2) Information extraction of design requirements

In the process of costume design, the designer expects the results of the investigation on the function of auxiliary tools as shown in figure 2. As can be seen from figure 2, 72.31% of the votes expected to provide sketch and color help through auxiliary tools, and 53.85% of the votes expected to directly connect with customer needs through this function, which means that the design ideas of fashion designers cannot be separated from the assistance of tools.

Figure 2. Survey results of functional expectations for auxiliary tools

4.2. Intelligent Design Scheme Discussion

(1) Adaptive fusion docking

In the utilization of big data, the established data resources should be dynamically connected with the needs of customers as much as possible to fully guarantee the level of Shared data and business openness. From artificial intelligence to big data and cloud computing, clothing design is also from the point to the surface, from the whole to the overall development of the layout, the interconnection terminal should be closely connected with the concept of clothing design, clothing design becomes more suitable for the masses. Sharing technology with users is the performance of paying attention to brand building. Ten years ago, sohu network was once the largest portal website, but the reason for its decline is that it neglected to share technology solution innovation with users. Now, SoHu network market value is far less than ali, baidu and other enterprises. The same is true of the clothing industry, which needs to integrate and innovate the artificial intelligence and big data that reflect the characteristics of the new technologies of The Times, so as to meet the demand of consumption.

(2) Open data

Artificial intelligence is built on the basis of open data sharing, connecting people, people and
machines, machine and machine power input and output of the efficient dialogue. The idea of integrating intelligent design into costume design means that more inter-group requirements can be quickly connected to the terminals of software and hardware. A network company in Guangdong province has designed a home APP that enables customers to experience 360° virtual reality display effect and 2h rapid production customization process. The practice of this business idea shows that when multiple artificial intelligence systems jointly participate in determining a result, artificial intelligence technologies can avoid interfering with each other. The sharing of big data needs to optimize the collection of different social, consumption, graphic and other information to achieve efficient output. This can be learned from tencent social information, Alibaba launched online consumption system. If all businesses are unwilling to open up data sharing, it is difficult to integrate the products of The Times into people's life and design clothes suitable for all kinds of users, whether it is clothing design or data application application in other fields.

(3) Adhere to aesthetic comfort

The purpose of innovative clothing design is always to return to make the human body feel comfortable, happy and beautiful to wear, and the intelligent selection of materials is the key step of intelligent design. Ever since scientists first used graphene to make clothes, consumers have seen how smart black technology has changed their lives. The graphene-sensitive special structure, which can shrink the graphene belt, detects the client's breathing rate and transmits it to the micro-display of the dress, allowing the skirt to change colors and flash frequency according to the breathing rate and pattern. This design enables users to instantly project different designs and colors, and its multi-thinking creative materials and aesthetics will be unique.

(4) Ensuring data security

Big data security refers to the protection of data security required by artificial intelligence, as well as the privacy information security of consumers. After big data and artificial intelligence are integrated into the innovation of clothing design, the customer's name, phone number, address, age, body information and even the bank card number will be stored in the database management system of clothing design manufacturers, which brings certain uncertainty to the information security of consumers. These identity characteristics can also be stolen by third parties when customers collect body and appearance information. How to ensure the confidentiality of customer data and protect the rights and interests of customers from abuse is a problem that must be solved in the design of clothing artificial intelligence. Some foreign companies can refer to the user information packaging processing, and generate unique code for identification and verification, but found that there are other parties trying to clone the customer information or for other illegal activities, the network security department of the public security network immediately to achieve alarm. The national department in charge of network information security should also start from the standpoint of perfect legal system, strengthen the data encryption standard and protection, and the supervision mechanism should keep up with the fast changing pace of the big data era.

5. Conclusion

In the information age, the clothing industry has been impacted by the Internet technology, but it also brings opportunities. As long as the clothing industry is good at using the favorable factors brought by
big data and artificial intelligence to conduct clothing design, it can turn crisis into opportunity. Today, as intelligence permeates all walks of life, clothing design innovation has a broad prospect and a large space to be extended, which also opens up a new management mode for the improvement of the work efficiency of clothing enterprises and the management of consumer data. In a period of time in the future, the tools of clothing innovation design will be more perfect, the effect of innovation will be more effective, and make clothing design innovation become a new normal.

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