Research on Jewelry Product Conceptual Design Modeling Based on Big Data Technology

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Abstract: With the development of the times, the progress of society and the continuous improvement of human science and technology, big data technology has been widely used in our daily production and life. Jewelry products are also in this era of rapid development of innovation, its design concept and design style are constantly changing, the level of processing technology continues to improve, the use of materials and precision is also constantly supplemented. Therefore, in order to cope with the development of jewelry products in this new era, this paper proposes a method of integrating big data technology with jewelry product conceptual design modeling. This paper analyzes and forecasts the new development direction of jewelry products through big data technology, so that the staff of jewelry industry can intuitively and accurately see the new development method and direction of jewelry products in the new era. Through the analysis, a series of methods proposed in this paper can basically meet the personalized needs of consumers for jewelry product aesthetics in the new era, as well as the rational cognition of emotion, which provides a new idea for the conceptual design of jewelry products.

Keywords: Big Data Technology, Jewelry Products, Science and Technology, Concept Design

1. Introduction

Big data technology [1-3] is the technical support of big data. From the national level, major countries in the world actively formulate big data strategies and strive to occupy a dominant position in stimulating international competition. In order to promote the development of big data technology, it
should be carried out from the perspective of national strategy. From the government level, actively promoting the development of big data technology is conducive to the public sharing of government data information, promoting social equity and justice, and improving the utilization rate of data resources. From the enterprise level, using big data technology can obtain a lot of customer data. Through the collection, processing, storage, mining and analysis of big data, enterprises can draw relevant conclusions and assist decision-making. In the traditional small data era, only data can be obtained, and random sampling can be carried out for data analysis and research. In today's big data era, full sample data can be obtained by using big data technology, and the value of data can be deeply mined.

Jewelry product [4-5] concept design is to create, decompose and design the functional structure of jewelry products according to the needs of users and the requirements of various stages of jewelry product life cycle. The process of conceptual design [6-8] is a process of divergent, comprehensive thinking and innovative design. It is also the process of determining the comprehensive optimal scheme among various feasible schemes, realizing the functions and meeting the technical and economic indexes. In recent years, the research of conceptual design has become a hot topic. Throughout the research in this field at home and abroad, the main research topics are the theory and method of conceptual (innovative) design, the application of artificial intelligence [9-10], design support environment, and conceptual design system of specific products. Jewelry product data modeling and life cycle process modeling are the basis of computer-aided product development. Many modeling methods are described in many literatures.

This paper studies the conceptual design modeling of jewelry products in the new era. In order to meet the consumers' aesthetic personalized demand and emotional rational cognition of jewelry products in the new era, the development of jewelry industry can keep up with the development trend of the new era, and the conceptual design modeling of jewelry products is innovated. Therefore, this paper puts forward the method of integrating big data technology with conceptual design modeling of jewelry products, which provides a new idea for conceptual design of jewelry products.

2. Modeling Method of Jewelry Product Conceptual Design Based on Big Data Technology

2.1 Big Data Technology

Big data is one of the core supports of the new generation of information technology industry. With the development of modern information technology, the concept of big data has been popularized all over the world. Big data is the product of information technology and social development. The solution of big data problems can promote the real landing and application of emerging information technologies such as cloud computing and Internet of things. Big data provides solid support for cloud computing, Internet of things, mobile Internet and other new generation information technologies, and is one of the core supports of the new generation of information technology industry. Nowadays, big data technology has also penetrated into people's lives, affecting people's transportation, medical care, education, tourism and other aspects.

2.2 Research on Jewelry Product Conceptual Design Modeling

The process of jewelry product innovation design is a process of thinking divergence, and then
optimization and convergence are carried out according to various constraints. In the process of jewelry product design, the most concentrated and outstanding stage of innovation performance is the conceptual design stage of jewelry products. Based on the research of several jewelry product conceptual design modeling methods, the concept of jewelry product holographic model which emphasizes human-computer interaction intelligence is proposed. The so-called holographic model of jewelry products refers not only to the definition data of jewelry products themselves, but also to the definition data of jewelry application environment. At the same time, we should pay special attention to the interaction between jewelry products and environment. In this way, the multi-level information of jewelry products can be obtained, and the jewelry product model can truly reflect the dynamic evolution process and characteristics of jewelry products.

3. Experimental Correlation Analysis

3.1 Experimental Background

With the increase of income, the Chinese people's awareness of jewelry consumption is also increasing; wearing jewelry suitable for them has become a social fashion. According to statistics, the annual sales volume of China's jewelry industry has been growing rapidly for many years. Urban residents, especially those in first tier cities such as Beijing, Shanghai, Guangzhou and Shenzhen, buy jewelry on the wedding day and give each other jewelry during the festival. Some consumers also buy jewelry in order to maintain and increase value. Chinese consumers' awareness of jewelry consumption is recovering. The broad jewelry consumer market provides unimaginable prospects for the development of jewelry industry.

3.2 Experimental Design

Through the analysis of the current situation of jewelry industry, we have a clearer understanding of the advantages and disadvantages, opportunities and threats of the development of jewelry industry. The development of jewelry industry should adhere to the principle of developing the advantages and avoiding the disadvantages, and seek the development of its own advantages on the basis of avoiding its own shortcomings and shortcomings. Therefore, the overall strategic choice of jewelry industry should mainly consider how to avoid its own disadvantages, focus on its own advantages, and choose its own development strategy. According to the survey on the development status of China's jewelry industry, the survey results are shown in Table 1:

| advantage                     | inferiority       | opportunity                  | threaten                                                                 |
|-------------------------------|-------------------|------------------------------|--------------------------------------------------------------------------|
| Independent R & D and design capabilities | Low brand awareness | China's rapid economic growth | Strong competitive pressure of jewelry brands in Europe, America, Hong Kong |
4. Discussion

4.1 Analysis of Jewelry Product Conceptual Design Modeling Based on Big Data Technology

The vigorous development of China's jewelry market is closely related to the development of national economy and the increase of national income, which is the material basis for the prosperity of jewelry market. Only when people have economic foundation can they enjoy the beauty of gems and jades and have time to experience the spiritual enjoyment brought by gem culture. With the development of the national economy and the improvement of people's income level, people's consumption ability is also improving, and the consumption structure is also changing. This paper investigates the sales of jewelry in China in recent years, the survey results are shown in Figure 1:
As shown in Figure 1, the table shows the relationship between jewelry sales and national income in 2014-2019. With the continuous development of China's economy, the overall income of the national economy continues to improve, and the sales volume of jewelry industry is also increasing year by year. As can be seen from Figure 1, the growth rate of China's jewelry consumption in 2014, 2016 and 2018 was faster than that of the gross national income. With the increasing proportion of jewelry industry consumption in the gross national income, we can clearly see that the development trend of China's jewelry industry is bright, and there is still a lot of room for development in the future.

In 2019, China's per capita disposable income will increase by 11.1% year-on-year (regardless of the impact of population growth on national residents' income), 10% for urban residents and 10.2% for rural residents. In 2019, China's jewelry consumption will be 4764.6 billion yuan. According to China's jewelry sales in recent years, we can further estimate the growth trend of China's jewelry consumption in the next five years, as shown in Figure 2. It is estimated that China's jewelry consumption will reach 29565.4 billion yuan in 2024.
As shown in Figure 2: in the next few years, with the steady development of China's economy and the continuous improvement of national income, jewelry consumption will continue to grow. In particular, the government's policies and investment in rural areas make the income of Chinese farmers continue to increase. Farmers will become the main force of jewelry consumption, and the rural market will also become the main driving force to promote the future development of China's jewelry market. There is still a lot of room for the development of the jewelry industry, and there is a huge potential for development. It is also necessary to continuously innovate and develop it, so as to meet the needs of the development of the jewelry industry in the new era.

4.2 Development Suggestions of Jewelry Product Conceptual Design Modeling Based on Big Data Technology

E-commerce under big data technology is a new network transaction mode, while jewelry is a kind of traditional, valuable and strong personal attribute consumer goods. How to combine the two organically, make the traditional goods take the express of e-commerce, and create a new development mode, this content is very worthy of in-depth study. Although a number of jewelry e-commerce platforms and implementation have been established and achieved certain market effect, many private enterprises, as pearl dust jewelry production and processing workers, in the face of the tide of e-commerce, either become professional OEM producers completely, or create their own brands with the help of e-commerce platform, and gradually move from the backstage to the front desk in the fierce market competition. I think many powerful OEM jewelry enterprises will choose the latter development mode more. Therefore, e-commerce is an effective tool worthy of their careful study and utilization.
The shape, pattern and color of jewelry are very attractive and can be judged by the eyes alone. Jewelry design is not jewelry itself, nor the way to make jewelry, but has the beauty attribute of making jewelry attractive. At the same time, this kind of aesthetic design is applied to the industrial production of jewelry, which will determine the shape and appearance of jewelry and improve the function of jewelry. From the concept and attribute of jewelry design, it can be seen that jewelry design has a very close relationship with industrial design and practical artworks. It can be protected by patent right as a design, or protected by copyright as a practical artwork.

China's jewelry industry has a huge market foundation and development potential. China's jewelry industry started late, and the added value of its products is low, so it is a big jewelry export and processing country. The competition of jewelry industry is mainly the competition of jewelry products, and the key of product competition is the competition of design. In recent years, the number of patent applications for jewelry design has increased rapidly, and the protection of intellectual property rights in jewelry design industry is imminent. How to improve the overall level of China's jewelry industry and effectively protect jewelry design needs the support of intellectual property rights.

China's jewelry industry cluster has entered a stage of rapid development, but it has not yet entered the stage of high price industrial development. This is reflected in the lack of innovation in the jewelry market, lack of cooperation between enterprises, weak lock-in effect between each other, and the problem of disorderly competition in low prices is still prominent. In some tourist areas or small and medium-sized cities, designated tourism product stores and jewelry counters, in order to make huge profits, the operators intend to operate jewelry that does not match the name, which has brought great harm to the whole industry. Even some brand jewelry enterprises often expose problems such as low product quality and imperfect after-sales service. In order to regulate the market, support the higher authorities and protect the legitimate rights and interests of consumers, the State Administration of quality and technical supervision, the Department of technical supervision, tourism and other functions should strengthen the management of the jewelry market, strengthen law enforcement, and severely crack down on illegal acts that damage the interests of consumers by manufacturing and selling counterfeit jewelry products. The Ministry of industry and Commerce shall revoke the business license of the units and stalls that do not meet the operating conditions; and the Ministry of tourism shall cancel the operation qualification of the designated tourist shops with more problems.

The national and local governments should understand and guide China's jewelry and jade industry from a strategic height and create a suitable business environment. In the future, China's jewelry industry will develop in the direction of multi polarization, high efficiency and transparency. Multi polarization refers to the jewelry industry forming a wider range of industrial clusters in the market, relying on the resource advantages of different regions, forming different growth poles in different regions. High efficiency refers to the close cooperation between jewelry industry clusters. At the same time, the jewelry industry at all levels will be more transparent and people will be aware of the growing market share of jewelry and jewelry industry, the situation of a hundred flowers blooming. The design of jewelry products is more in line with people's personalized needs. Therefore, China's jewelry industry should change the past labor-intensive and extensive development mode, and establish an intensive development mode based on technological progress and financial capital operation. In the limited industrial area, we should optimize the structure of jewelry products, provide
personalized products, through unique design, change the traditional processing and manufacturing business service-oriented industry, reduce the business risk of jewelry industry, obtain more profit space, improve economic benefits, and promote the sustainable development of China's jewelry industry.

5. Conclusions

This paper mainly introduces the research method of jewelry product conceptual design modeling based on big data technology. In today's high-speed development of big data era, all walks of life are faced with the problem that they cannot keep up with the pace of development of the times, and are faced with the risk of elimination at any time. Therefore, in order to meet the challenges faced by the jewelry industry in this new era, this paper proposes a method of integrating big data technology and jewelry product conceptual design modeling. Through professional analysis, it is found that a series of methods proposed in this paper can basically meet the personalized aesthetic needs of consumers for jewelry products in the new era, as well as the rational cognition of emotion, which provides a new idea for the conceptual design of jewelry products.

References

[1] Lee W S, Han E J, Sohn S Y. Predicting the pattern of technology convergence using big-data technology on large-scale triadic patents[J]. Technological Forecasting and Social Change, 2015, 100:317-329.

[2] Liu Z, Wang Y, Cai L, et al. Design and manufacturing model of customized hydrostatic bearing system based on cloud and big data technology[J]. International Journal of Advanced Manufacturing Technology, 2016, 84(1-4):261-273.

[3] Ma J, Cheng J C P. Estimation of the building energy use intensity in the urban scale by integrating GIS and big data technology[J]. Applied Energy, 2016, 183:182-192.

[4] Negev M, Berman T, Reicher S, et al. Concentrations of trace metals, phthalates, bisphenol A and flame-retardants in toys and other children's products in Israel[J]. Chemosphere, 2018, 192(feb.):217-224.

[5] Dougherty M. Products profile next studio[J]. Hospitality design, 2018, 40(4):161-161.

[6] Crossley W A, Laananen D H. Conceptual design of helicopters via genetic algorithm[J]. Journal of Aircraft, 2015, 33(6):1062-1070.

[7] Ma Z M. A Conceptual Design Methodology for Fuzzy Relational Databases[J]. Journal of Database Management, 2017, 16(2):66-83.

[8] Gundlach J F, Philippe-André, Té, et al. Conceptual Design Studies of a Strut-Braced Wing
Transonic Transport[J]. Journal of Aircraft, 2015, 37(6):976-983.

[9] Lu H, Li Y, Chen M, et al. Brain Intelligence: Go Beyond Artificial Intelligence[J]. Mobile Networks and Applications, 2017, 23(2):368-375.

[10] Crawford E D, Batuello J T, Snow P, et al. The use of artificial intelligence technology to predict lymph node spread in men with clinically localized prostate carcinoma[J]. Cancer, 2015, 88(9):2105-2109.