Design and Research of Personalized Customization of Glasses Based on Virtual Reality Technology

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Abstract. In order to enhance consumers' demand for personalized customization of eyeglasses using virtual reality technology. Based on the background of virtual reality technology, the design of eyeglasses is studied according to the needs of consumers and the development level of personalized customization. Summarized that the current style, material and color of glasses cannot meet the personalized needs of consumers and users want to participate in the design process of their own glasses. Through the establishment of personalized customization platform of eyeglasses based on virtual reality technology, the participation of users in the process of eyeglasses design can be improved. By guiding users to participate in the process of eyeglasses design, the need for personalized customization of eyeglasses can be met, which provides theoretical basis and reference for personalized design activities in other fields.

Introduction

With the rapid development of economy and the continuous improvement of residents' living standards, people's demands for quality of life are getting higher and higher, especially for the individualized demand of products. Products not only have basic functions, but also can satisfy the real needs of users. Therefore, individualized customization of products has become one of them. It's an inevitable trend. When people go to the optician's shop to match glasses, they often find that they don't have the style, color and material they like. In view of these situations, we have conducted in-depth market research on the user's demand for eyeglasses 'style, material and color, and analyzed the problems found in the survey report. We have put forward the personalized customization of eyeglasses based on virtual reality technology, aiming to guide users to participate in the design process of eyeglasses and satisfy people's needs for eyeglasses, requirements for personalized customization.

The Necessity of Individualized Customization of Glasses

Personalization of Products has Become a Trend.

In today's society, with the development of economy and the improvement of people's living standards, people have more diverse needs, desires and values. Especially, people put more self-emotion into their personal clothing. Individualized production demand has become a new trend. Therefore, these factors play an important role in today's product design process, and guide the design along the direction of personalization.

Personalized products proposed today are based on the progress of human civilization. People gradually realize that the physiological and psychological factors of people in product design are different from each other. Everyone has the right to participate in social life and share all the achievements of invention and creation of social civilization. Busy economy and society emphasize rational function, lack of emotional communication and communication between people. Therefore, in the process of design, more emphasis is laid on the complementarity, mutual penetration and combination of rationality and perception, and on the non-uniformity of design, highlighting personality and characteristics, to meet people's needs for individualization and diversification of products.

At present, personalized product customization also has certain development, such as users can upload patterns on NICK official website and customize their own exclusive shoes; some time ago, Apple released its second generation of Apple Pencil, and supported free engraving service to customize its own personalized Pencil; and, like a series of modular furniture launched by IKEA, users can according to their needs. Seek self-assembly, to meet their own personalized needs. However, these are still the initial stages of personalized customization, and the participation of users is not high, so improving the participation of users is the main development direction of personalized customization in the future, which also points out the direction for the establishment of our personalized customization platform (website) based on virtual reality technology.

The Quality of Consumer Goods has been Upgraded and the Demand for Individualized Glasses has become Increasingly Strong.

With the rapid development of economy and the improvement of living standards, people's desire for wearable products and personalization is becoming stronger and stronger. The upgrading of people's consumption level has a direct impact on the development direction of product design and consumption direction. In addition to the demand for the basic use function of products, more is the emotional language of products. Whether consumers can achieve the purpose of emotional appeal, consumers can from It is a good product to find psychological resonance in the product and to have a pleasant attitude. People put more emotions into their personal clothes, and the demand for personalized customization has become a new fashion trend. As a personal exclusive wearing product, spectacles have a strong demand for personalization. Individualized customization of eyeglasses can effectively solve the problems of single product shape, monotonous style, product out of stock or backlog caused by mass production, avoid waste of materials and save costs, and more importantly, truly meet the personalized needs of consumers.

Rapid Development of Virtual Reality Technology

Virtual Reality Technology.
Virtual reality technology is not a new thing, its concept can be traced back to the 1960s. Virtual reality technology refers to the creation of three-dimensional environment with the help of computer system and sensor technology, creating a new way of human-computer interaction, through the mobilization of users' various senses (vision, hearing, touch, smell, etc.) to enjoy a more real and immersive experience. In the industry, virtual reality is defined as three kinds of technology applications: virtual reality (VR), augmented reality (AR) and mixed reality (MR, Mixed Reality). VR was first proposed in 1989, but it has not been recognized by the market. With the acquisition of Oculus by Facebook and the continuous improvement of technology, VR is in its first year of development in 2014. From 2014 to 2016, VR is in the period of market cultivation, especially at the 2016 American Consumer Electronics Exhibition, and virtual reality products will become the absolute leading role of the exhibition. With the emergence of widely used products, in 2017-2019, VR will enter a period of rapid development, the industry's demand for standards, compatible applications and accessories will grow rapidly, VR consumer market awareness will deepen, and VR enterprise-level market will be enhanced. It is expected that by 2020, the virtual reality market will enter a relatively mature period. Hardware solutions converge, platform systems open source, most of the technical problems will be effectively solved, content support is comprehensive, application scenarios are improved, and the industry chain will gradually improve.

Development Prospect of Virtual Reality Technology.
"Suddenly, as the spring breeze comes overnight, thousands of trees and pears blossom." In recent years, virtual reality, a new word, has frequently entered the public eye and entered people's lives, such as VR glasses, VR helmet, VR news, VR video, VR games, VR movies and so on. It is dazzling. With the rapid development of virtual reality technology and the release of consumer-grade virtual reality products such as Oculus Rift and HTC Vive in recent years, the global market of consumer-grade virtual reality products is becoming more and more mature. Virtual reality industry-level products and applications are also emerging. Virtual reality is on the eve of industrial outbreak, and will enter a window period of sustained and rapid development. During the three years

from 2014 to 2016, 350 venture capital investments were made in the VR/AR field, with a total investment of US$5 billion, which greatly promoted the rapid development of virtual reality industry in hardware, software, content, applications and services. With the rapid development of virtual reality technology, the immersion and experience of virtual reality products are gradually enhanced to meet people's needs.

The content of video and game in virtual reality is becoming more and more abundant, and the effect is more shocking. Virtual reality technology is rapidly penetrating into equipment manufacturing, education, cultural media, tourism, military, aerospace, equipment manufacturing, medical and other industries. A win-win "platform + application" closed-loop ecosphere has been formed among business, consumers and developers. This is a disruptive technology that may change the future, and it is expected to become a new technological support for the development of some industries in the future.

Realizing Individualized Customization of Glasses

Meas0has a certain degree of complexity. In addition to the size based on ergonomics, the shape and structure of glasses also have a lot of data to be processed. With the rapid development and application of virtual reality technology, scanning measurement and data statistical processing of head and face greatly simplify the customization process of glasses.

Establishment of Personalized Customization Platform for Eyeglasses (Website).

The personalized customization platform for eyeglasses (website) is a customization platform for eyeglasses (website) which is developed by using modern Internet technology and virtual reality technology to provide more comprehensive and systematic information and services for consumers through the platform to facilitate the expression and transmission of users'personalized needs. This platform aims to provide personalized glasses products for users with different needs, and users can really participate in the design process of their own glasses, so as to meet users' personalized needs for glasses. Customers enter the eyeglasses personalized customization platform (website), using virtual reality technology to scan face and face data to ensure that eyeglasses truly meet ergonomics and wear comfort; then online selection of eyeglasses style, color, etc., according to their own needs to customize their own personalized eyeglasses. The framework of the personalized customization platform for glasses (website) is shown in Figure 1.
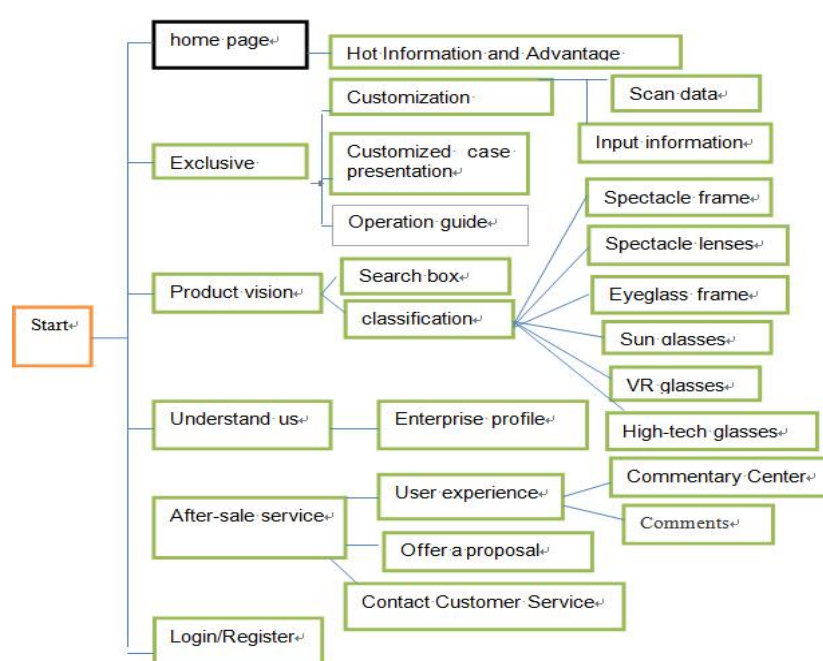
Figure. 1 Glasses personalized platform(website) framework

Users can enter the platform(website) customization center to customize their own personalized exclusive glasses, users can connect VR devices for scanning data, virtual display or manual input information to collect data. Then choose the material, color, shape, or imported model of the mirror frame, mirror leg and other accessories online for personalization.

3D Print-Made Glasses.

With the continuous breakthrough of 3D printing technology, the increasing diversity of new printing materials, the speed and accuracy of 3D printing are constantly improving, its technology is constantly being updated and optimized, and the application field is constantly expanding, gradually entering people's daily life. In, Change people's lives.

Since glasses are irregular, complex in structure and have high functional requirements, the general design of glasses is made using open molds. This method is costly and has low production flexibility. 3D printing technology can solve all problems from a three-dimensional perspective. First, 3D printing technology can quickly and accurately shape the various parts of the eyeglasses, to meet the appearance of the eyeglasses design; Secondly, 3D printing technology produces high flexibility, the optical design scheme is flexible, and the possibility of realization is also greatly improved, so as to better meet the user's personalized needs; Finally, 3D printing technology features can make many otherwise impossible structures possible, realizing the lightweight of the optical product and making the product more comfortable.

Forming an Industrial Chain

Designers are indispensable for product design. The reason why the tourism and cultural product industry in Jiangsu lags behind is the lack of product design and development, as well as perfect management. Therefore, it is necessary to form a complete industrial chain and cultivate the external image of Jiangsu.

Conclusion

The personalization of glasses based on virtual reality technology is to connect the user's personalization needs with production. While satisfying the user's needs, it also explores the new direction of personalization and customization of modern glasses design and production based on virtual reality technology. The user obtains the relevant data and analyzes through the virtual reality technology, face scan, and then the user personalizes the glasses through the website. The user participates in the entire process of customization and truly realizes the personalization needs.

Acknowledgements

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