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RESEARCH ARTICLE

Innovation of Visual Communication Design Mode Based on Internet of Things and Sustainable Development

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ABSTRACT

With the rapid development of modern society, people's thinking has progressed with the passage of time, and the way people treat things has also progressed with the passage of time. In order to gain greater market share and customer recognition, designers must keep pace with the times and integrate modern elements into the design. Sustainable Development (SD) has become a hot topic in recent years. As the focus of theory, Visual Communication (VC) design must also adapt to the trend of social development to a certain extent. At the same time, with the update of Internet technology, the VC design in the Internet of Things (IoT) era is no longer limited to the innovation of single media design, and more attention should be paid to multimedia design and application. Multimedia integrated redesign is a new content of cloud design. It emphasizes the diversity of designers' experience, the characteristics of space-time communication, nonlinear narrative methods and targeted information content, and provides the audience with mutual text and smooth interaction and experience information. In order to innovate the VC design mode, this paper used the IoT technology and SD strategy to study the VC design mode. This paper first discussed the basic elements of the VC design model and the difficulties faced, and then made a detailed study of the VC design model under the context of the IoT and the VC design model under SD. The experiment part compared the clothing brand advertising design with traditional advertising design using IoT technology and sustainable concept. The experimental results showed that, compared with traditional advertising, clothing brand advertising design using IoT technology and sustainable concept had better innovation, interactivity, uniqueness and sustainability, and could more stimulate the purchase desire of the audience. 48.8% of the people wanted to buy after watching the advertisement. This showed that IoT technology and SD could be better applied to the innovation of VC design mode.

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1. PREFACE

1.1 Introduction

In the era of image readers, many visual things in life show a trend of visual development, and VC design is becoming a popular research profession. With the support of the IoT technology, media presents a more diverse form of integration as the carrier of information content. In recent years, SD has become a topic of discussion by showing diverse experiences, spatio-temporal communication, nonlinear narrative and personalized information. VC design must also adapt to the trend of social development to a certain extent. As an important means of obtaining information, VC design concept must keep pace with the times. Digital media and network technology are ubiquitous in the

mainstream field. VC design needs reform and innovation to convey information more accurately. Based on the concept of intelligent IoT and SD, this paper conducted innovative research on VC design, which aimed to promote the coordinated development of VC design and adapt to the development of the times.

1.2 Investigation status of VC design mode based on IoT and SD

VC design can enable people to get good information about things, and the research work on it has become more and more in recent years. Sun F analyzed the influence of automatic arrangement of graphic language on VC design, and finally found that the algorithm based on automatic arrangement of graphic language could promote the effect of VC (Sun, 2019). Saris Brenda analyzed the key points that should be paid attention to in the creative design process of VC from the perspective of VC design educators, and finally concluded that learners' active participation in the creative design process was the top priority (Saris, 2020). Rosmiati A believed that the VC design of animation was the most appropriate means to help children learn early. Practice showed that some excellent animation VC design really helped to develop children's sensory and motor skills (Rosmiati, 2020). Haishan Z H U discussed the teaching strategy of decorative painting in the current VC design specialty, and finally concluded that only by continuously improving students' cultural quality and aesthetic ability could VC be better applied to decorative painting (Haishan, 2018). Widyokusumo Lintang emphasized the importance of visual elements in VC design, and pointed out that the participation of visual elements would provide certain design inspiration for VC design (Widyokusumo, 2017). Ilma N used the method of VC design to show the specific information during the epidemic of COVID-19. The practice showed that this method was feasible and effective (Ilma, 2021). Jian Geng analyzed the main teaching methods of VC design at present, and then pointed out that under the new era background, teaching methods should be more combined with modern information technology (Jian, 2017). These researches on VC design were more specific, but they were not applied to the IoT.

With the continuous maturity of the IoT technology, it has many applications in the field of VC. Wu Haotian applied the IoT to the VC design of graffiti art, and finally found that the IoT could provide more creative materials for creators (Wu, 2020). Liu Xixia applied cloud computing technology in the IoT to the research of VC design. The experimental results showed that this technology provided a new path for the next development of VC design (Liu, 2020). Ji Wen proposed a visual IoT architecture based on VC to improve the information disclosure capability of smart cities. The simulation experiment showed that the new architecture could effectively process and analyze the visual data in the smart city (Ji, 2019). Akiki Pierre A proposed an information conversion method called visual simple conversion combining VC and the IoT. Practice showed that this method realized the effective connection between the IoT and visual information (Akiki, 2017). Chen Chang Wen proposed a video IoT, which used visual sensors to achieve VC. The actual application scenario also showed that the network had a good performance in video or VC (Chen, 2020). Liu Shuai proposed a monitoring method of the IoT in combination with VC, and then ensured the tracking speed and overall success rate of visual tracking through the fuzzy auxiliary system (Liu, 2021). Villemur Martin believed that the energy perception processor in the intelligent IoT could achieve VC and processing. The experimental results showed that the processor did have a good effect in VC (Villemur, 2018). These researches on the application of the IoT in VC were still of reference value, but they did not mention SD.

1.3 Proposal of investigation topic and investigation significance

In today's rapidly developing economy, a large number of new theories, new processes and new technologies are emerging every day. Many schools are expanding their VC design courses, which proves that VC design is increasingly important. In order to innovate the VC design mode, this paper applied the IoT technology and SD to the research of VC design mode. This paper studied the VC design methods and corresponding algorithms in the context of the IoT, and carried out innovative research on the VC design mode based on the concept of SD, which also verified the effectiveness of the design in the experimental part.

2. VC DESIGN MODE

2.1 VC design and its basic elements

VC design is a form of transmitting information to visual oriented people. In short, it is the information that designers convey to everyone in the form of visual symbols, which reflects anything, such as text, film, image, sculpture. The sender of information is the designer, and the receiver of information is the person to whom the information is transmitted. VC can be divided into visual symbols and communications. Visual symbols represent symbols of words, films, television, photos, music, ancient coins, etc. They can represent everything in people's eyes. Communication is a process of transferring from one direction to another. VC design is something people see in the field of VC design, which can transmit different information, such as TV ads, road signs, exhibition goods display, etc. (Wenjuan, 2021).

The content of VC design is relatively extensive. It can be either a roadside billboard or an artwork on a large exhibition, but neither of them can be separated from its three main elements: text, graphics and color. In general, text and graphic design are relatively easy to understand. Different from the first two elements, color is the most complex and important element in VC design. Humans are considered sensitive animals. When they see things with their eyes, color is the most attractive. With the passage of time, this color memory would also move with the passage of time. In VC design, designers should not only pay attention to color itself, but also pay attention to the visual performance of color, which is the only way to achieve the best VC (Zhao, 2020).

2.2 Difficulties in VC design

In the era of digital media, people can receive external information through various mobile devices. VC design is to be able to redesign and reproduce it, so as to send it more accurately to all who need it. Although there are many new media, the level and quality of VC design in media can not meet the requirements. Many people do not criticize, which eventually leads to the deterioration of the VC design environment. Secondly, the lack of qualified human resources and industry standards is also an urgent problem. The chaos of multimedia content production and the creative defects of content production indirectly affect the development of the industry. Finally, due to the traditional education concept, the teaching design mode of VC design has become outdated and incompatible with modern technology, which not only lacks creativity, but also separates the VC design business from the modern market (Bratslavsky, 2019).

3. VC design and related algorithms in the context of the IoT

3.1 Aesthetic update in VC design

It can be said that the IoT is formed on the basis of the Internet, but it is higher than the Internet. In addition to virtual attributes, the IoT must also be connected to real objects. When the IoT is applied to VC design, people pay more attention to aesthetic design, especially the aesthetic design in the IoT environment, including traditional aesthetics and virtual aesthetics. Virtual aesthetics involves technicality and transcendence, and influences traditional aesthetics in different forms. No matter what kind of aesthetics, it serves aesthetic activities in VC design and is different from other times. When the VC design of the IoT has more technical content and different environments, it also changes the aesthetic awareness and needs. On the one hand, visual symbols and visual elements use different technologies and media, which is very important for transmitting visual information. Through information processing and design, formal beauty would be transmitted. On the other hand, the transformation from multimedia to VC design provides a broader creative space. The combination of beautiful forms among different media would constantly update people's aesthetic awareness, and stimulate designers' enthusiasm for aesthetic design, so as to create VC works, and better meet the aesthetic needs of the public.

3.2 Characteristics of media convergence under the IoT technology

The characteristics of media convergence under the IoT technology are shown in Figure 1.

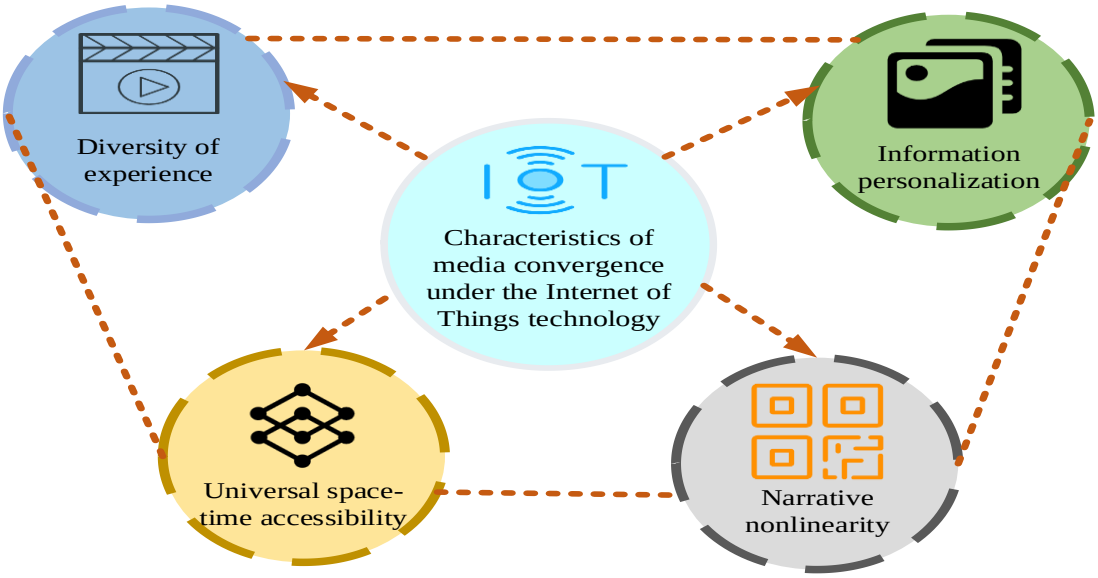


Figure 1: Characteristics of media convergence under the IoT technology

3.2.1 Diversity of experience

Media integration itself is a different multimedia application mode, and the technical features and visual language features of different media are uniformly reflected in the output interface of project works. By taking a travel publishing design as an example, the website is extended to applications in the form of existing simple books. In order to meet the different needs of visitors to read information at different times and spaces, travel books provide visual, auditory, tactile, olfactory and even taste experiences through more diversified communication methods, which combines sound and painting with different materials and reading modes. This application not only integrates different reading website experiences, but also combines picturesque places for a more realistic experience.

3.2.2 Communication of space-time

Media integration forms multiple spatial dimensions to better play the memory effect. Designers must combine the principles and laws of multi-dimensional design to learn the design method of multi space integration, including online websites and interactive applications. In addition to offline books, tourism publishing companies also use radio frequency technology to combine the actual scenic spots with online displays, and break the time and space constraints, so as to provide real-time interpretation for tourists. Visitors can also download instant feelings to provide suggestions for future generations.

3.2.3 Narrative nonlinearity

Different media form an organic whole. According to the characteristics of media, information is transmitted and connected through QR code, radio frequency identification and other IoT technologies. Through the non-linear multimedia integration of the earth and human elements, viewers can obtain more comprehensive information from any media to meet their needs. They match the perception of visitors, which gives them a visual impression and a pleasant reading experience.

3.2.4 Information personalization

In the context of media integration, VC design not only continues the characteristics of traditional mass communication, but also can take advantage of the personalized advantages of new media. As an information transmission terminal, smart phones not only make connections more extensive, but also make information transmission more targeted.

3.3 VC Design of media integration

3.3.1 Intertextuality design

In the traditional VC, the audience mainly observes the information related to vision, and fixes the information through search and retrieval. The communication type generated by the fusion of visual media is an integrated communication type. The performance of interaction is communicated through various media to obtain sufficient information. From visual attractiveness to strong media capabilities, and from the formation of soft consciousness to the final emotional feedback, multimedia networks provide the audience with greater reaction space, thus forming an "interactive" space. Among them, design is no longer one-way communication but multi-directional interaction. Cross cultural design should allow the masses to participate independently and supplement other media. The IoT technology is the framework of this "cross-cultural world", which integrates "heteromorphic symbols". It is the broadest and longest realization of "cultural reciprocity", which immerses the audience in the observation and experience of multimedia media.

3.3.2 Montage design

VC design media integration is a whole, namely cross media design. Compilation is an effective method of integrated design. In media integration, all media can be regarded as a series of records. Only by combining each record can a complete work be produced. VC is no longer the environment of spatial perception. It includes the thinking mechanism and perception itself. Therefore, the application of montage method connects the information blocks constructed based on ideas. This not only increases the complexity and experience interest, but also creates new value in the process of connecting various carriers designed based on the IoT technology. It can also cut and paste information multiple times according to the design intent. When designing cross media, designers cannot simply connect media design with IoT technology after it is completed. They need to think and plan the entire design from the beginning, so that audiences can experience different dynamic processes.

3.3.3 Smooth design

In order to achieve a seamless multimedia integrated design environment, it is necessary to ensure that information can be transferred quickly and easily from all processed connections. In addition to the information output stage, the designer must also encode the information accurately as soon as possible to allow visual display of the information. In addition, in the information input stage, the audience's senses need to quickly perceive the information in a large amount of data to complete information decoding. The real-time connection based on the IoT technology can make the multimedia design theme more comprehensive and diverse, and the audience can get a more smooth design experience. It is necessary to fully consider the contact level and effect between the target group and the media, and optimize and select the media, so as to reasonably build the communication structure and consistency and pay attention to the influence of the times. It also needs to take actions and turn the media to media integration, so as to effectively reduce communication noise and make information transmission more accurate.

3.4 Design algorithm of VC method based on small and weak target image

3.4.1 Feature extraction of small and weak target image

To obtain the target image features, the microwave transform is used to analyze the gray scale and detailed attributes of the image, and then the gray projection is used to obtain the target features. In a region or multiple images, part of the contrast of image features must be reflected in VC. In order to improve the contrast of image features and reduce the process, they would be replaced by the difference process between zooms.

$$A = \frac{1}{2\pi\alpha_a^2} - \frac{1}{2\pi\alpha_b^2}\exp\left[-\frac{\varepsilon^2}{2\alpha_b^2}\right] (1)$$

In the formula, ε is the measured feature contrast, α_a and α_b are factors that affect the size of the target area and the known area. It is assumed that the coarse image and fine image are displayed as $C(a)$ and $C(b)$ respectively, and the difference formula is as follows:

$$C(a,b)=C(a)\times C(b) \quad (2)$$

When capturing gray and detailed image features of multi screen targets, it is assumed that $E_x(a)$ and $E_x(b)$ display the distance between targets with the same difference and proportion, while point by point subtraction displays relative absolute values $G_x(a,d)$ and $G_x(b,d)$. The formula is as follows:

$$\begin{cases} E_x(a,b)=E_x(a)\times E_x(b) \\ G_x(a,b,d)=G_x(a,d)\times G_x(b,d) \end{cases} \quad (3)$$

The gray level value of the (z,v)th pixel in the i frames is $J(z,v)$; the shearing estimation between the i frames is η_1; and the shearing estimation of the $i+n$ th frame is η_2. The shearing calculation can be used:

$$H_x(z,v)=\left|J_x(z,v)-J_{x-i}(z-\eta_1,v-\eta_2)\right| \quad (4)$$

It is assumed that ω, τ and υ are three weight factors, and the basic features of each image are combined with the weight factor. The formula is as follows:

$$\psi_x=\omega f(\sigma_x)+\tau f(\gamma_x)+\upsilon f(\lambda_x) \quad (5)$$

3.4.2 Real time VC

By acquiring weak target image features and optimizing particle swarm to supplement VC, the problem of VC is transformed into the problem of object perspective separation and image background separation. Among them, the dispersion proportion function between perspective and background image feature distribution is used as the separation coefficient to achieve VC. On the feature weighted component of the image, an optimization particle swarm optimization method is introduced. To determine the difference in image spacing, it is assumed that the deviation formula of the save function is as follows:

$$M_{dt}(\theta:\vartheta)=I\left[\theta(\vartheta)^2\right]-\left(L\left[\theta(\vartheta)\right]\right) \quad (6)$$

In the formula, $\theta(\vartheta)$ represents the logarithmic probability relative function; the foreground range scale is $I\left[\theta(\vartheta)^2\right]$; the background scale is expressed as $\left(L\left[\theta(\vartheta)\right]\right)$; weights are expressed as vectors.

$$m=\left[p_1,p_2,p_3\right] \quad (7)$$

In the formula, p_1, p_2 and p_3 are the feature vectors of the displayed image.

The best adaptive solution of the corresponding particle is the best solution of the current particle. After several iterations, the acquisition speed and direction are constantly adjusted. The iteration formula is as follows:

$$M_{zv}(n+1)=M_{zv}(n)+r_1s_1\left(W_{zv}-l_{zv}(n)\right)+r_2s_2\left(W'_{zv}-l'_{zv}(n)\right) \quad (8)$$

In the formula, r_1 and r_2 represent learning factors; s_1 and s_2 are uniform random numbers; W_{zv} represents the optimal solution of the current particle; n represents the number of iterations. The optimal solution obtained here is the solution obtained when each particle remains unchanged after iteration, which can track the image features of weak targets and transmit them intuitively.

4. VC design mode under SD

4.1 Connotation of SD

SD is to realize the SD of ecological environment including environment and resources. To achieve environmental SD, it is necessary not only to reduce pollution, but also to make rational use of natural resources. It is impossible to stop life. What human beings need to do now is to make rational use of resources, and optimize resource allocation, so as to improve resource utilization. This is also the first step towards SD. The concept of SD is that people must recycle and reuse natural resources when using them. "Sustainability" needs to be focused. That is to say, it is used to reduce resource consumption, while leaving part of the material base for future generations.

4.2 SD of Contemporary VC Design

4.2.1 Multi-dimensional informatization and sustainability of VC

At present, 3D digital technology has matured, and augmented reality, virtual reality and hybrid reality technologies are widely used in data transmission. For example, when customers need images and materials related to products, they can better understand products through virtual reality glasses. It can effectively transfer the information required by the product, so that consumers can experience the product more intuitively. By using various convenient technologies, it does not need to move back and forth on paper information and samples, which can greatly save processing technology.

4.2.2 Low tech and sustainable VC

Low technology refers to traditional or mature technologies, such as traditional wood and bamboo technologies, compared with high technology. For example, in some rural areas, it is common to see packaged natural products, including bamboo coke tubes and straw granular bags, which transmit natural and green signals in raw materials and packaging design. In other countries in the world, low technology design concepts are playing a huge role in VC design. The designer designed a low technology egg package, which is mainly made of hay, and the package is similar to a rectangle. The material is more durable, which can protect eggs from function damage more than traditional cartons, with lower production cost and simpler production process. Most chicken houses are made of hay. Packaging related to chicken houses can give consumers a better sense of products and convey the concepts of "nature" and "ecology". The sustainable VC advertisement is shown in Figure 2.

Figure 2: Sustainable VC advertising

4.3 Scientific application of VC design under SD theory

4.3.1 Design product packaging based on color and sustainability theory

In the process of rapid economic development, various products come one after another. The company packages products in different ways, which provides high novelty and visibility. For example, when designing tea products, it is better to use green as the color of product logo, and fully interpret it as the tea shape on the package, so as to effectively promote business development and improve product competitiveness. It is worth noting that the color combination of packaging design should not be too mixed.

When color is used for the SD of VC design, people should follow these two principles. First of all, in the packaging design process, the color is positioned according to different consumer groups. Secondly, the preferred packaging is based on the consumer group's preference for color. In the process of VC design, the above principles shall be followed to promote SD. The VC design using color and sustainability theory is shown in Figure 3.

Figure 3: VC design using color and sustainability theory

4.3.2 Sustainable VC design in various signs

In the changing economy, people's needs have changed and new industries are emerging. The graphic design industry is one of the industries with huge growth potential. At present, the economic development is changing people's lifestyle and accelerating the pace to a certain extent. For development, people effectively develop products in the process of product marketing to ensure that users can evaluate products. This communication process is a VC process, and color is the most attractive observation element. The effective use of color design signs in VC is conducive to the SD of the company.

Through scientific research, people can divide colors into cold colors and warm colors. When different colors are used in products, people would feel the different intensities of color marks. The use of cold color signs has brought a profound feeling to the products. For example, when green signs are used in product design, people would feel that the products are more profound. When orange or yellow colors are used, people would feel warm. In VC design, the use of warm and bright colors can effectively promote the development of current VC design, and improve the recognition of the company's employees, so as to enhance the healthy development of the company.

In the VC design, the color part determines the development of the company, and the color must be used correctly. The color of the logo can reflect the thoughts and feelings that the designer wants to express, and the correct color application can effectively promote the healthy development of the current VC design market. In terms of color composition, the original color must match the same type of color to ensure color balance, good design effect and the success of VC design. The scientific application of color contributes to the SD of VC design, and meets the growing visual needs of modern people, which also promotes the development of the design industry.

5. Experimental investigation on Innovation of VC design mode

IoT technology and sustainable concept were used to design a clothing brand and compare it with traditional clothing advertising. A questionnaire survey was conducted from five aspects: innovation, interaction, uniqueness, sustainability, and purchase desire. A total of 287 questionnaires were received, including 256 valid ones.

5.1 Innovation of clothing advertising

The innovative evaluation results of clothing advertising are shown in Figure 4.

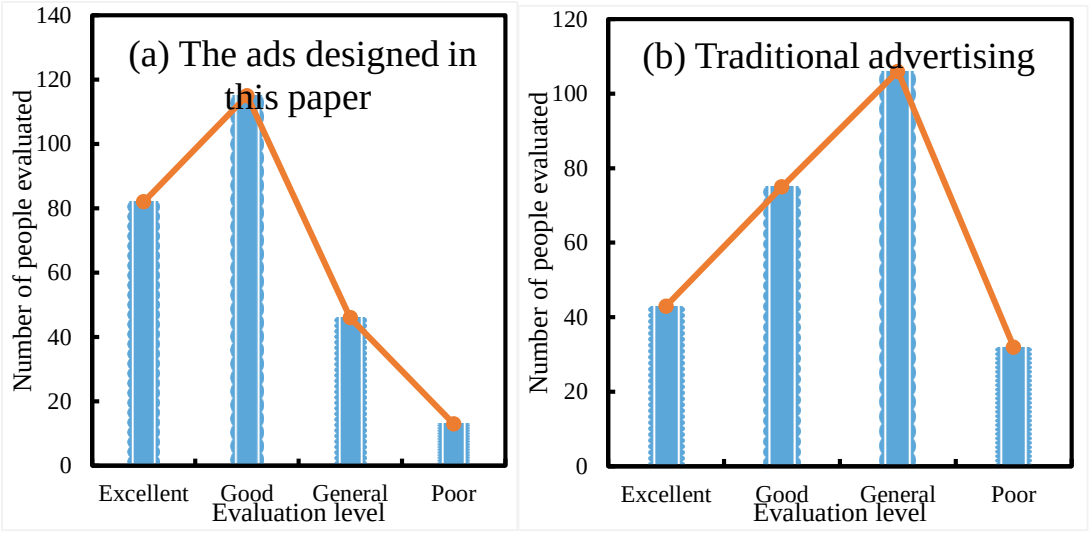


Figure 4: Results of innovative apparel advertising evaluation

Figure 4 (a) showed the innovative evaluation results of clothing advertising design conducted by the IoT technology and sustainable concept, and Figure 4 (b) showed the innovative evaluation results of traditional clothing advertising design. As can be seen from the data in Figure 4, this paper used the IoT technology and sustainable concept to design a clothing brand. 82 people thought the advertisement was very innovative, and 115 people thought the advertisement was innovative. For the traditional clothing advertising design, the most people thought that the innovation of the advertisement was ordinary. The number of people was 106, which was much higher than other options. It could be seen from the comparative data that the use of IoT technology and sustainable concept to design a clothing brand was more innovative than traditional advertising.

5.2 Interactive clothing advertising

The interactive evaluation results of clothing advertising are shown in Figure 5.

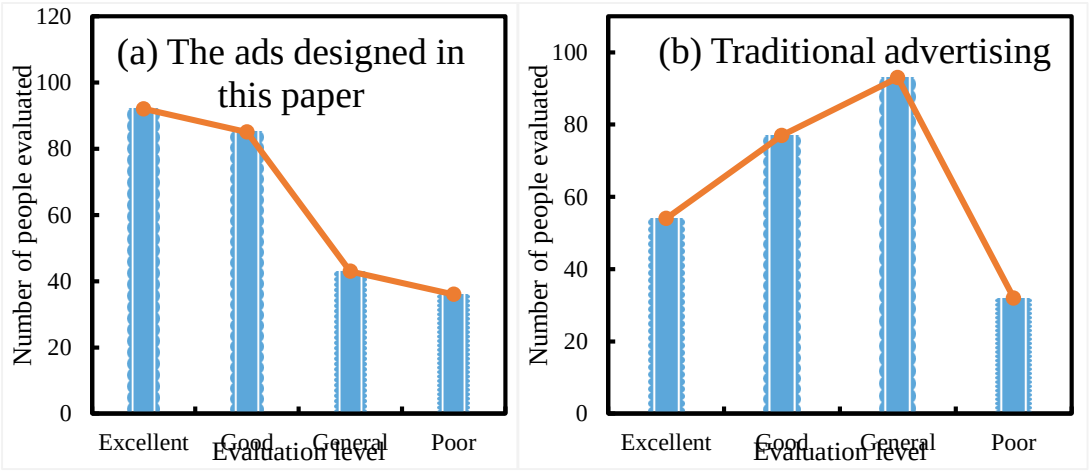


Figure 5: The interactive evaluation results of clothing advertising

Figure 5 (a) showed the interactive evaluation results of clothing advertising design conducted by the IoT technology and sustainable concept, and Figure 5 (b) showed the interactive evaluation results of traditional clothing advertising design. 35.9% of the thought think that clothing advertising using IoT technology and sustainable concept had very good interactivity, and 33.2% of the people thought that clothing advertising using IoT technology and sustainable concept had good interactivity. However, most people thought that the interaction of traditional clothing advertising was ordinary. It could be seen from the comparative data that the use of IoT technology and sustainable concept to design a clothing brand had a high interactivity compared with traditional advertising.

5.3 Uniqueness of clothing advertising

The evaluation results of clothing advertising uniqueness are shown in Figure 6.

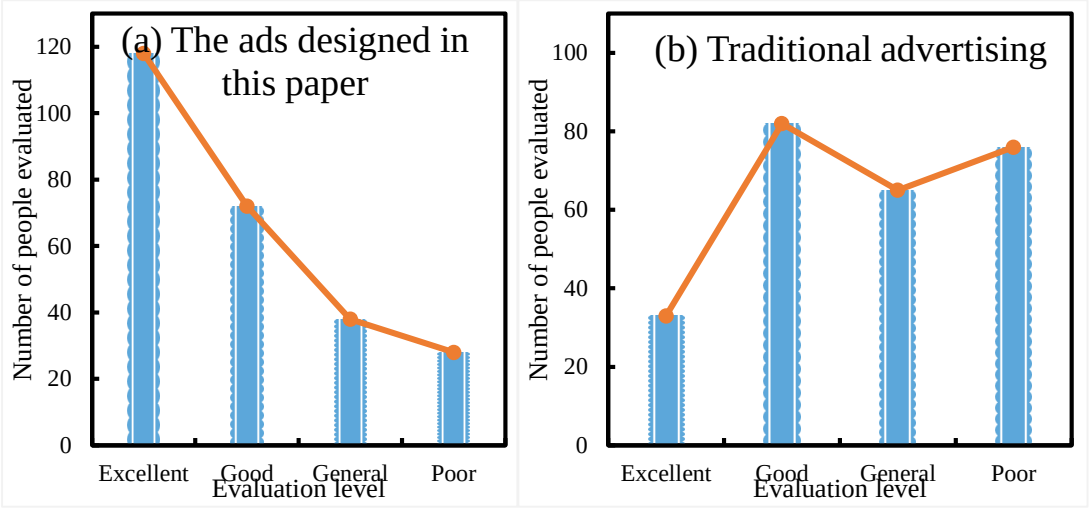


Figure 6: The uniqueness evaluation results of clothing advertising

Figure 6 (a) showed the uniqueness evaluation results of clothing advertising design conducted by the IoT technology and sustainable concept, and Figure 6 (b) showed the uniqueness evaluation results of traditional clothing advertising design. For the clothing advertisement designed with the IoT technology and sustainable concept, 118 people thought that the advertisement was very unique. The number of people in this option was far higher than that in other options, indicating that this advertisement had a high degree of uniqueness. In traditional advertisement evaluation, fewer people thought that the advertisement was very unique. 82 people thought the advertisement had good uniqueness, and 65 people thought the advertisement had ordinary uniqueness. 76 people thought that the uniqueness of the advertisement was poor, and the number of people with three options was relatively average. This showed that the uniqueness of traditional advertising needed to be strengthened. It could be seen from the comparative data that the use of IoT technology and sustainable concept to design a clothing brand was more unique than traditional advertising.

5.4 Sustainability of clothing advertising

The evaluation results of clothing advertising sustainability are shown in Figure 7.

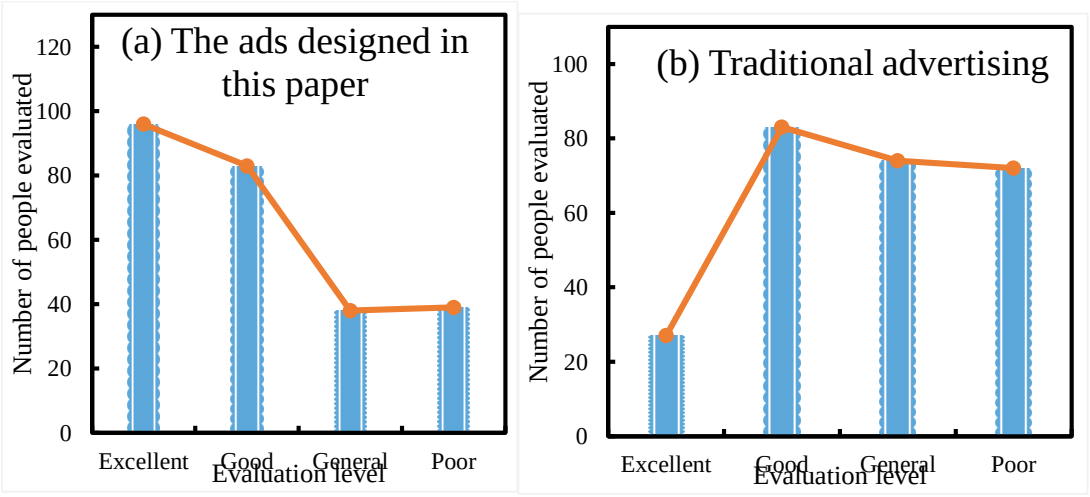


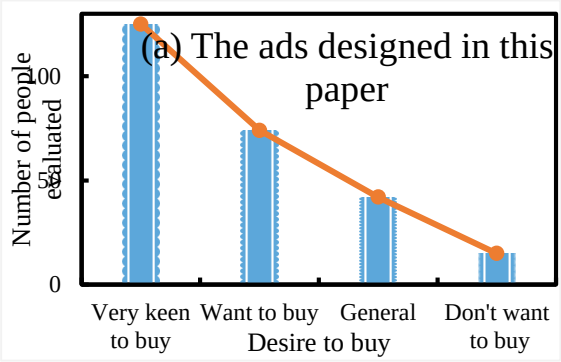
Figure 7: The sustainability evaluation results of clothing advertising

Figure 7 (a) showed the sustainability evaluation results of clothing advertising design conducted by the IoT technology and sustainable concept, and Figure 7 (b) showed the sustainability evaluation results of traditional clothing advertising design. For the clothing advertisement designed with IoT technology and sustainable concept, the advertisement incorporated the design principle of SD concept, so many people believed that the advertisement had good sustainability. For traditional advertising, the number of people who thought that the sustainability of the advertising was general

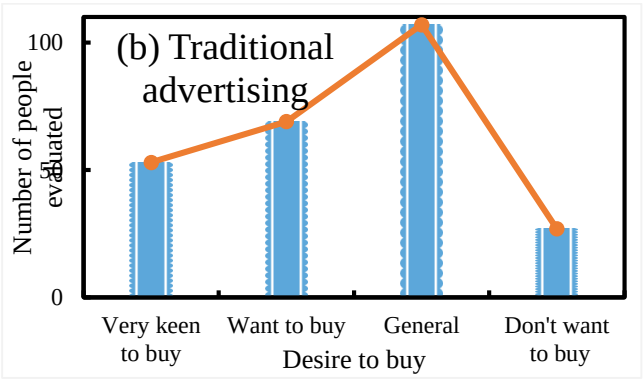
and poor was far higher than the number of people who evaluated the clothing advertising designed with the IoT technology and sustainable concept. It could be seen from the comparative data that the use of IoT technology and sustainable concept to design a clothing brand was more sustainable than traditional advertising.

5.5 Customers' desire to purchase

The results of customers' purchase desire are shown in Figure 8.



(a) Purchase desire results for the clothing ads designed in this paper



(b) Purchase desire results from traditional clothing advertising

Figure 8: Customer desire to buy results

Figure 8 (a) showed the result of customers' desire to buy in clothing advertising design using IoT technology and sustainable concept, and Figure 8 (b) showed the result of customers' desire to buy in traditional clothing advertising design. For clothing advertisements designed with the IoT technology and sustainable concept, 125 people wanted to buy them after watching the advertisements very much, accounting for 48.8% of the total evaluated people; there were 74 people who wanted to buy, accounting for 28.9% of the total evaluators; there were 42 people with ordinary purchase desire, accounting for 16.4% of the total evaluation; there were 15 people who had no desire to buy, accounting for 5.86% of the total evaluation. It could be seen that after watching the clothing advertisement designed with the IoT technology and sustainable concept, most people had a desire to buy, which showed that the advertisement could well mobilize the audience's interest in the product. For traditional advertisements, 53 people wanted to buy them after watching the advertisements very much, accounting for 20.7% of the total number of people evaluated; there were 69 people who wanted to buy, accounting for 27% of the total evaluators; there were 107 people with ordinary purchase desire, accounting for 41.8% of the total evaluation; there were 27 people who had no desire to buy, accounting for 10.5% of the total evaluation. It could be seen that the use of IoT technology and sustainable concept to design a clothing brand could stimulate customers' desire to buy more than traditional advertising.

6. CONCLUSIONS

In recent years, "packaging" and "design" are regarded as economic or commercial activities, and material goods, food, clothing, housing and transportation have attracted great attention. When the material civilization reaches a certain stage of development, people are no longer satisfied, and more

and more people begin to look for connotation and culture. With the advent of the brand era, SD has become a hot issue. The era of brand SD concept is coming quietly, and images appear in modern form. At the same time, with the continuous development of network technology, IoT technology is also applied to VC design. This paper used IoT technology and SD theory to carry out innovative research on VC design mode. The research results showed that this research could greatly enhance the innovation, interaction, uniqueness and sustainability of VC design, and could enhance the purchase desire of the audience.

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