The Development Trend of Visual Communication Design in the Internet Era

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Abstract. The rapid development of computer and Internet technology has provided new opportunities and opportunities for the development of the media industry, and at the same time, the media industry needs to face new changes and challenges. Especially under the background of rapid popularization and application in internet plus, it has begun to permeate into the visual communication design, which has a significant impact on the visual communication design. Based on this, this paper introduces the design of visual communication and the basic characteristics of the Internet age, analyzes the superiority of visual communication design based on the Internet, discusses the future development trend of visual communication design from two-dimensional to multi-dimensional directions and man-machine interaction and analyzes the specific application of Vray renderer and human-computer interaction interface visual feature sampling technology in visual communication design in order to provide reference for visual communication design on the Internet.

Keywords: Internet · Visual Communication · Development Direction

1 Introduction

After the 21st century, the development of Internet technology has obviously accelerated, and China has officially entered the era of internet plus, especially in industries closely related to Internet technology, which has a far-reaching impact [1]. For example, during the visual design period, designers can make use of the abundant resources of the network to obtain a large number of design elements, and at the same time, make use of the advanced Internet concept to constantly innovate design methods and styles [2]. Compared with the traditional visual communication design, internet plus's visual communication design has obvious advantages. With the rapid development of information Internet technology, continuous innovation of design patterns, improvement of resource allocation and element construction can give full play to the superiority of visual communication and improve the overall design level [3]. Nowadays, many scholars in China have also carried out in-depth research on this. Scholar Li Dongyu (2020) proposed that in the era of mobile Internet, visual communication design makes people's hearing and vision form a strong sense of experience, while visual communication design faces many challenges. Li Yanyan (2020) proposed that the visual design in the Internet era should

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always include three elements: humanistic elements, technological elements and service elements. At the same time, he proposed that the future visual communication design should be developed in the direction of high capacity, strong fluidity and high efficiency [4]. It can be seen that the future development trend of visual communication design in the Internet era has also become a concern of many scholars.

2 Research Status of Visual Communication Design in the Internet Era

With the rapid development of Internet technology, many scholars have carried out relevant research and discussed the development trend of visual communication design in the new media era. Li Kunze [5] (2019), a scholar, thinks that visual communication design will develop from two-dimensional space to three-dimensional space, from static design to dynamic design and immaterial design will be more obvious. Scholar Li Wanhua [7] (2020) thinks that visual communication design will develop towards diversification, integration, dynamics, virtualization and interaction. Scholar Yuan Shuai [6] (2020) has basically the same view as scholar Li Wanhua. After summarizing the characteristics of new media, he thinks that visual communication design will develop towards integration, dynamics and virtualization. Through the summary and analysis of the above literature, it can be seen that the Internet era has promoted the development of new media technology, and at the same time provided new ideas and design methods for visual communication design. As a visual communication designer, we should make full use of Internet technology to enrich the means and methods of visual communication design, so as to strengthen the appeal of visual communication design and improve the overall quality of design.

3 Advantages of Visual Communication Design Based on Internet

3.1 Diversified Modes of Communication

Traditional visual design can only rely on monotonous words, pictures or audio to complete visual communication. In the era of internet plus, the ways of visual communication are more diversified, including not only words, pictures and audio, but also different kinds of presentation methods such as games, virtual effects and animations, which significantly enrich the contents and ways of visual design, break the traditional visual limitations, make all kinds of design methods coexist, and significantly improve the comprehensive design ability. This provides diversified expressions for visual communication design, which can make visual communication design design and package commodities in more diversified forms, and make people have a more comprehensive and in-depth understanding of product design effects.

3.2 Covering a Wide Range

Don't go underground on the Internet, people can know all kinds of news time without leaving home. It can be seen that the Internet has the advantage of fast transmission

speed and wide signal coverage, and it is integrated with visual communication design to provide faster transmission speed and wider coverage for visual communication design, especially driven by the World Wide Web technology and various communication channels. It can be seen that Internet users all over the world can get relevant information, and the Internet has become the fourth revolution of the media industry, realizing the sharing of information data and providing diversified information content for visual communication design.

3.3 The Spread Speed is Accelerated

Under the background of Internet, the speed of information development is accelerated, and the efficiency of data transmission is significantly improved. Therefore, the spread speed of visual communication design based on Internet is accelerated, and it has ideal immediacy and timeliness. Take publications and magazines as an example. Even after the design is completed, it still needs printing, transportation and other links to reach the audience. Visual communication on the Internet can be done directly online, and all Internet users can browse related consultation at the first time and anywhere at the same time, so the communication is highly synchronous. It is the application of Internet technology that makes the distance between people closer and strengthens people's feelings about information and data.

3.4 Significant Communication

Under the background of the Internet, communication and communication are more bordered and smooth, especially the interactivity and immediacy are strengthened, which makes internet plus visual communication design meet the communication between design users and designers, effectively avoids the phenomenon of information asymmetry, and changes the traditional one-way communication into two-way communication, so that designers can make timely adjustments and feedback according to the actual situation, and the design audience can break through the constraints of time and space. Communicate and communicate with designers at any time and any place to meet users' requirements on design, ensure the accuracy of design and the efficiency of information communication, and effectively save the frequency and cost of communication, which finally makes the visual communication design in internet plus more ideal.

4 The Development Trend of Visual Communication Design Under the Background of Internet

4.1 Two-Dimensional to Multi-dimensional Direction for Development

For the concept of multidimensional, it originated from geometry at the earliest, and was derived from concepts such as one-dimensional, two-dimensional and three-dimensional. Dimension is the general name of this type of concept. The development of network technology provides a new platform and method for visual communication design, but it makes the visual language change from the original two-dimensional space

to the three-dimensional space or even the four-dimensional space. The traditional visual design representation method is to complete the arrangement of words, pictures and colors in a two-dimensional space. With the rapid development of new media, visual design needs more novel design methods and rapid transmission of information to influence the audience. Therefore, it is an inevitable trend to break the two-dimensional constraint. It should be noted that multi-dimension does not refer to the dimensional space of practical significance, but a multi-dimensional virtual space created by network technology and new media technology. Visual multi-dimensional language contains two meanings at the same time: first, the dimensional space of new media creation, and second, the nonlinear layout. Non-linearity refers to the special creative thinking mode of visual communication design of new media, which is formed on the basis of the overall structure of new media. Compared with the traditional linear thinking of plane water, designers need to organize design elements in multi-dimensional space during design creation, including virtual three-dimensional forms, time and sound effects. Network technology and new media technology provide designers with brand-new design language and thinking methods, as well as novel design perspectives and creative space by virtue of excellent interaction and special space-time.

Three-dimensional space is a virtual space that can be perceived, and virtual is a way of thinking that uses imagination and association to transcend reality. In the network era of high, sophisticated and sophisticated science and technology, the virtual connotation has been further expanded. Strictly speaking, the concept of plane media space still belongs to the simulation based on plane foundation. People rely on visual acceptance and psychological cognition to realize the transformation of design goals from two-dimensional to three-dimensional. The emergence and popularization of three-dimensional design technology has significantly improved the overall design efficiency and engineering efficiency. In the process of creation, we can edit and modify the existing designs, or choose a new starting point to redesign them, which will help designers save a lot of creation time and energy, and there will be no waste of materials.

Nowadays, 3D space simulation software provides support for more challenging landscape design, advertising scenes and cartoon design, such as the construction and rendering of 3D models, which can obtain more exquisite appearance and diversified viewing angles with the later effects of scenes and lighting. Taking Vray renderer as an example, designers can try to use Vray renderer to improve the design effect in the process of visual design. The specific operations are as follows: First, reasonably design the skills of rendering test parameters. Designers can refer to the parameter design in the network or design independently. In the test phase, the parameter design is as follows: for the global switch panel, turn off the 3D default light, and turn off the reflection/refraction and smoothing effect; Image sampling equipment, set to a fixed ratio, with a numerical value of 1; Turn off the anti-aliasing filter; The lighting map is preset to be very low, the model subdivision is 30, and the difference sampling design is 10; The lighting buffer is designed to be subdivided by 100; RQMC adopts equipment adaptation quantity of 0.95, noise threshold of 0.5, minimum sampling value of 8 and global subdivision multiplier of 0.1; And the subdivision value of the lighting material needs to be appropriately reduced by 5 to 8. The design values of the parameters of the plotting link are as follows: turn on the reflection/refraction and smoothing effect in the global switch panel; Image sampling

Fig. 1. Rendering effect of 1Vray renderer.

equipment selects adaptive quasi-Monte Carlo; Open the anti-aliasing filter and select Mitchell-Netravali;; The lighting map is selected as Medium, the model subdivision is set to 50, and the interpolation sampling is set to 30; The light buffer is set to subdivision 1200; The adaptive number of RQMC sampler is set to 0.8, the noise threshold is set to 0.005, the minimum sampling value is set to 15, and the global subdivision multiplier is set to 2. The subdivision value of light material can be increased by 20 to 50 according to the actual situation [8].

Second, the application of lighting skills. When lighting, the designer starts from the skylight and keeps adding lights. Every time the lights are added, it is necessary to carry out test rendering until the lights in the scene are adjusted to the best. The basic light distribution order is skylight, sunshine, artificial decorative lamp and fill light. If the environmental effect is not good, the skylight intensity can be appropriately adjusted, or the brightness of the exposed dark part can be increased, or other decorative lamps or auxiliary light sources can be added. In this way, an ideal rendering effect can be obtained and a stronger visual impact can be provided to the audience (as shown in Fig. 1).

With the rapid development of Internet, all kinds of new media are constantly emerging, and the visual communication world regains visual language, thus bringing visual communication design into virtual multi-dimensional space. In the virtual environment created by rendering technology, designers can give full play to their own imagination, break the limitations of two-dimensional design, and use multi-dimensional perspective or nonlinear thinking for creative expression, giving visual communication design more special visual expressive force.

4.2 Human-Computer Interaction Design

Interaction is a relatively broad concept, and its application in various fields has different meanings. In the new media visual communication design environment, interaction refers to the audience's participation and influence in designing products, which is exerted

by different behaviors. Human-computer interaction refers to the interaction between systems and users. Systems can be different types of equipment, but also computerized systems and software. Man-machine interface often refers to the content visible to the audience. Users use man-machine interface and system to communicate and complete operations. In the Internet era, interactivity has become the most special design language of visual communication design, which has been fully reflected in diversified practices. The introduction of a sound and systematic digital network provides a platform for interaction and the integration of many factors such as text, pictures and products.

Nowadays, interactive design language has been widely used in visual design of new media, such as interactive advertising design, web design and user interface design. The new digital and inherited visual design of media has created a new mode of visual information data transmission, and the more important thing is to realize the communication between the audience and the interface, which is not limited to the information transmission interface. With the support of network technology, we can pay more attention to the feelings of the audience. For example, the activity billboard launched by IBM can dynamically change the color of the billboard in combination with the front clothing characteristics, so as to achieve the effect of attracting the attention of passers-by. Here, the visual communication information collection technology of human-computer interaction interface is applied. The designer uses the 4*4 block combination model to sample the visual features of human-computer interaction interface, uses the frame scanning technology to collect the images of human-computer interaction interface and reconstruct the two-dimensional features, establishes the matching matrix {W1, W2 … WDI} of the target template, symbolizes the vector weighting of the visual communication images of human-computer interaction interface, and applies the adaptive analytic hierarchy process to analyze the boundary feature set of human-computer interaction interface. Setting the calculation method of the correlation distribution length of the visual communication image position information of the human-computer interaction interface as L = xmax-xmin and the calculation method of the interaction width of others as W = ymax-ymin, the sparseness characteristic of the human-computer interaction interface is H = zmax-zmin, and the topological structure of the visual communication image of the human-computer interaction interface can be reconstructed by the way of three-dimensional space reconstruction, including the following four vectors:

$$\begin{cases} x_1 = p_1 - m \\ x_2 = p_2 - m \\ x_3 = p_3 - m \\ x_4 = m \end{cases}$$

M represents the scale of boundary segmentation of visual communication image of human-computer interaction interface in the field, completes the segmentation of visual communication area of human-computer interaction interface under the framework of MCAMP, analyzes the single frame information I(x, y) of the interaction interface, and integrates the overall reconstruction with reference template vector moment η and noise

template moment Rx in space. The estimated value is as follows:

$$\eta = \arg\min_{\eta} L(\eta), R_x = \frac{1}{K}\sum_{k=1}^{K} x_k x_k^H$$

L(η) represents the inverse Fourier transform to obtain a set of filtered images, the boundary segmentation of the human-computer interface visual communication image is completed by binarization processing, the local features of the image are reasonably used to improve the visual communication, and the image frequency enhancement feature distribution is obtained. Template matching is carried out in Fourier frequency domain based on the curved face sum, and the difference value between the boundary texture feature quantity s(X,Y) of the human-computer interface visual communication image and the template is obtained, and the pixel point (I, J) is regarded as the initial clustering center. Combined with the above processing, we can search the visual communication characteristics of human-computer interaction interface based on the central point, and complete the three-dimensional establishment of the communication image.

5 Conclusion

In the Internet era, visual communication design has the advantages of high capacity, high efficiency and high coverage, which has changed people's daily life. Therefore, designers should be clear about the changes of visual communication design in the history of the Internet, and make it clear that visual design will change to multi-dimensional and human-computer interaction, so as to promote the development of visual communication design methods through effective ways.

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