New Thinking on the "VR+" Path of Virtual Reality Industry

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Abstract: This paper briefly introduces virtual reality technology, expounds the characteristics and composition of virtual reality technology, and conducts in-depth research and analysis on the development path of "VR+" in virtual reality industry, hoping to develop "VR+" of virtual reality industry. This paper will play a certain reference and help, and lay a good foundation for the sustainable and stable development of the virtual reality industry.

1. Introduction
In 2016, China's virtual reality industry developed rapidly. Not only did companies such as Stormwind and Goer Acoustics compete, but Tencent and Alibaba also developed into the VR industry market. This year was called the first year of the VR industry. Some studies had found that the VR industry entered an explosive development stage in 2016, and it had exposed a series of problems while promoting the development of the VR industry, such as lack of unified technical standards, few excellent products, insufficient user experience, and serious low-end homogenization. Only by doing an analysis and solving these problems can we explore a healthy development strategy, promote the development of the VR industry toward Liang Xinghua, and meet the needs of the sustainable and stable development of the VR industry. This paper has carried out research and analysis.

2. Virtual Reality Technology
After the emergence of the computer, it has always been in the main position in the information processing environment, and can only handle various types of problems in the single-dimensional information space. In fact, people mainly use their own perception and cognition to acquire knowledge and recognize problems in multidimensional information space. In this case, there will be inconsistencies between the information space of the computer processing problem and the cognitive space of the human problem. It is difficult for human beings to directly understand the processing results of the information processing tool, and at the same time, it is impossible to establish a connection between the self-perception and the computer information processing environment. Under this circumstance, people hope to break the limitation of the existing computer processing pure digital information, and establish a multi-source information space, which not only facilitates the observation of information processing results from the outside, but also can participate in the information processing environment by using different senses such as hearing and vision which is also known as the virtual environment. The virtual environment is generated by the computer, and the user feels through the senses of hearing, sight, touch, etc., and has an immersive feeling.

Virtual reality refers to a computer system that can establish and experience a virtual world. The information space established by virtual reality can accommodate the multi-dimensional information space of various kinds of information, and the human sensibility and rational understanding can be fully utilized in this space.
3. Characteristics and Composition of Virtual Reality Technology

3.1. Characteristics of Virtual Reality Technology
First, immersive, virtual reality technology allows users to exist in a virtual environment. After wearing interactive devices such as monitors, users can be placed in a virtual environment, interacting with different objects in the virtual environment, and have a real-world feel. Users will have a realistic feeling in the virtual environment, as if they are there.

Second, interactivity, the authenticity of the user's degree of food operability in the virtual environment. The human-computer interaction of the virtual reality system is relatively close to nature. The user can interact with the mouse, keyboard, etc., and use sensors such as helmets and gloves to interact. The computer combines the user's body language and actions to adjust the sound and image presented by the system, and the user can also realize the operation and inspection of the objects in the virtual environment through his own language and actions.

Third, multi-perception, the virtual reality system is equipped with different sensing sensor devices such as sight, touch and hearing. The user can acquire the senses of hearing, touch and vision in the virtual environment to create an immersive experience. The research and development of VR is mainly to achieve the extension of people's cognition and perception. VR technology can perfectly combine people and technology, and in the whole system, people occupy a very large proportion. The application of VR technology can enable users to have an immersive experience, improve the depth and breadth of user cognition, expand the objective world cognition, and realize the essential reflection of the objective world.

3.2. Type of Virtual Reality System
Different types of classification, there will be significant differences in the types of virtual reality. As far as the actual development of virtual reality is concerned, the common selection criteria of virtual reality classification standards are high and low. According to the function level, virtual reality is divided into the following types:

First, the desktop-level virtual reality system, in this type of virtual reality system, mainly uses low-level workstations and computer simulations, uses the computer screen as an observation window, and manipulates the virtual environment through external devices to operate objects in the virtual environment. The desktop-level virtual reality system has low cost and single function in practical applications, and is widely used in games, CAD, CAM and other fields.

Second, the immersive virtual reality system, the immersive virtual reality system mainly uses helmets and other equipment to display, install interactive decorations in gloves, heads, etc., to close the user's sense of sight and hearing, and to isolate the user from the real environment. For the participants in the virtual reality environment, using a variety of interactive devices to operate the virtual environment, there is an immersive feeling. At the same time, you can use interactive devices to navigate the virtual environment and make the participants fully engaged. Immersive virtual reality can create an immersive experience for people, and it is widely used in training demonstrations and advanced games. But immersive virtual reality uses sensor devices such as helmets and gloves, which are expensive and more flexible in terms of software and hardware.

Third, the distributed virtual reality system, this virtual reality system mainly refers to the use of local resources to develop different types of virtual reality in the network environment. Distributed virtual reality is an optimistic product of immersive virtual reality. It can connect different areas of immersive virtual reality with the network and so on, so that different participants can connect with each other and participate in the virtual space. Currently distributed virtual reality mainly has two types of Internet-based virtual reality and high-speed dedicated network virtual reality.

Fourth, the augmented reality virtual reality system, also called the hybrid virtual reality system, can combine the real environment and the virtual environment, reduce the cost of real environment construction, select the virtual environment to replace part of the real environment, and have the function of operating objects.
3.3. Composition of Virtual Reality System

In the virtual reality system, the user can use the sensor to operate the virtual environment, and can acquire the three-dimensional reality and related information. If the feedback loop is constructed by using the sensing device between the system and the external environment, the interaction between the user and the virtual environment can be external to the outside world through the control of the user. The world works. In terms of composition, there are the following: First, the detection module detects the user operation instruction and transmits to the virtual environment by using the sensor module; second, the feedback module receives the information from the sensor module and feeds back to the user in real time; Third, the sensor module feeds back various results of the operation to the user while accepting the user's operation command; fourth, the control module, the control sensor, interacts between the virtual environment, the real environment and the user; fifth, modeling module, which represents the real world in three dimensions and builds a virtual environment.

Figure 1 Composition of Virtual Reality Technology

4. Problems in the Development of China's VR Industry

4.1. Technical Standards Are Not Uniform

VR is a new type of industry. From a global perspective, its technical standards have not yet been unified. China's VR-related industries have not yet had unified technical standards. From a macro perspective, the VR industry has not yet unified normative guidance. In the "VR" industry white paper launched by the China Electronics Technology Standardization Institute, it is emphasized that the current development of China's VR industry lacks healthy and fast standard guidance. At present, China's AVS labeling working group and international standardization organization have begun to develop virtual reality technology standards. From the microscopic point of view, virtual reality, regardless of the production of virtual equipment, or in the production of content, etc., there are standards in China, there are standards of non-uniformity, each company produces VR works according to its own standards, virtual equipment of various manufacturers also have significant differences Under the influence of standard non-uniform factors, it is difficult to achieve effective connection in all aspects of the VR industry chain.

4.2. Problems in Content Production Creation

VR belongs to the emerging cultural consumption category. In practical applications, it can break the limitations of traditional frames and borders. However, the current VR content products are not yet abundant, and future VR games and VR movies and TVs need to be further expanded and enriched. At this stage, the VR film and television content production mode is concentrated on UGC, and the implementation of PGC content still needs a long development time.

4.3. User Experience Needs to Be Improved

At present, VR still has problems such as dizziness, stereo vision error, position information error, and sound mismatch in the user experience. To achieve effective solution to these problems, it is necessary to master more core technologies and optimize existing technologies. upgrade. The first is the screen display technology, in order to enhance the user experience, the screen display technology must ensure that the single-eye resolution reaches 1K, the refresh rate is not lower than 90Hz; secondly, ensure that the field of view angle is above 100°, providing users with a high-quality visual experience; Third, the
delay needs to be controlled below 20ms. Fourth, the optimization and improvement of existing sensor technologies can effectively supplement the cognitive differences between reality and virtual.

4.4. Homogenization of VR devices
At present, there are hundreds of VR helmets with similar functions in China, and there are serious homogenization problems. To achieve effective changes to this problem, we must encourage innovation and optimization of VR enterprises, and give full play to the demonstration of leading enterprises. And take the lead, using innovative production methods to promote the sustainable and stable development of the VR industry.

5. China's VR Industry Health Development Strategy

5.1. Adhere to The Principle of People-Oriented and Do A Good Job in Technological Innovation
The VR industry is an interactive consumer product. In practical applications, virtual reality technology needs to adhere to the principle of people-oriented. In terms of technology optimization, it needs to be analyzed from the perspective of user experience. There are three core elements of the virtual reality user experience. First, the data is indulged. Second, the navigation in the computer-generated environment. Third, the interaction between the user and the virtual environment, and the realization of the accuracy of these three core elements. To grasp, we must adhere to the people-oriented concept.

At present, the difference between the technological level of China's VR industry development and the international advanced level is not very obvious. It can be said to be quite equal. Under such circumstances, it is necessary to accurately grasp the development opportunities, dare to innovate, and produce more excellent VR content and products, occupy more markets.

5.2. Pay Attention to The Compilation of Industry Standards and Promote The Standardization Development of VR Industry
As far as the current situation of China and global VR technology standards is concerned, relevant departments in China need to improve the development of VR industry standards, attach importance to the normative guidance of VR industry and the preparation of technical standards, and actively participate in the international VR standard plan, and contribute Power, occupy a more favorable position. In terms of specific operations, relevant units in China can encourage virtual reality enterprises, industry alliances, etc. to establish virtual reality standardization work institutions, formulate VR related technologies, products and evaluation index systems, and develop targeted evaluation tools to ensure that various products meet industry standards. The quality and performance of the products are qualified, with particular emphasis on the development of standards for virtual reality hardware interfaces, human-computer interaction, and information security. Relevant units also need to organize and guide the industrial exchange activities, attract exploration and research both inside and outside the industry, strengthen intra-industry exchanges, gather more industrial strengths, and lay a good foundation for the sustainable and stable development of the entire industry.

5.3. Guide Industry Integration and Establish Industry Geese
At present, there are serious low-end homogenization competition problems in China's VR industry. There are many VR products with low level of technology and similar functions in the current market, and relatively high level of VR products are relatively few. In order to achieve effective treatment of this problem, it is necessary to give play to the leading role of leading enterprises, do a good job in all aspects of capital integration, attract other companies to carry out technological R&D and innovation from the weak links of the VR industry chain, establish an industrial wild geese, and promote the development of VR industry.

Among China's VR industry, listed companies such as Stormwind Technology have strong technical and capital advantages and strong strength, but it is far from enough to rely on these listed
companies. A healthy and complete VR industry chain must ensure that there are a number of leading enterprises in all aspects, whether it is VR hardware equipment research and development, or VR platform portal enterprise, whether it is VR content developer, or VR shooting motion capture technology vendor, leading enterprise. The more the industry ecology is, the more stable it will be and the more sustainable it will be. Government departments need to properly guide these leading enterprises and carry out industrial integration to avoid a situation of scattered sand and individual war.

5.4. Promote “VR+” to Achieve Cross-Border Integration and Domain Expansion
Virtual reality technology has strong extension capabilities, which can break industry restrictions in practical applications and use “VR+” to achieve cross-domain and cross-border development. Using 3D characters, tracking, picture-in-picture and other technologies, it is widely used in the fields of film and television, real estate, tourism, education and so on. At this stage, many companies have begun to develop VR integration plans, such as Alibaba's "BUY+" VR e-commerce strategy, which has broad development prospects.

Relevant units in China can encourage pilot demonstrations, etc., to expand the scope of application of VR technology, such as the development of automotive and high-end equipment manufacturing industry, establish some virtual technology intelligent manufacturing demonstration points, and improve the scientific rationality of virtual reality technology in intelligent manufacturing. At the same time, it is actively exploring the education, medical and other industries, and constantly expanding new application areas.

6. Conclusion
Virtual reality technology is an advanced technology, with a high degree of integration, and a broad market space. In the current situation of media integration, it is necessary to have multi-dimensional integration thinking, combine the characteristics and needs of various fields, do a good job in technological innovation, and promote the multi-domain expansion and comprehensive development of “VR+”.

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