

Research on E-commerce platform experience based on virtual reality technology

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Abstract: With the continuous development of virtual reality technology, more and more industries are attempting to apply it to practical scenarios. E-commerce platforms, as an important component of modern commerce, have also begun to explore how to utilize virtual reality technology to enhance user experience. This article provides an overview of the current application status and trends of virtual reality technology in the field of e-commerce, analyzes the impact and mechanism of VR technology on e-commerce user experience, and explores the application modes and methods of VR technology in e-commerce platform experience. At the same time, this article also proposes corresponding countermeasures for the problems existing in VR technology in e-commerce platforms, in order to provide reference for the virtual reality of e-commerce platforms.

Keywords: virtual reality technology, E-commerce platforms, user experience

1. Introduction

With the continuous development of internet technology, e-commerce has become an indispensable part of modern business activities. As a rapidly developing emerging technology in recent years, virtual reality technology has also received increasing attention and application. Virtual reality technology can provide users with an immersive experience, making them feel as if they are in a completely virtual environment. Therefore, applying virtual reality technology to e-commerce platforms can not only improve users' shopping experience, but also bring more business opportunities and competitive advantages to e-commerce enterprises. This article aims to explore the current application status, existing problems, and countermeasures of virtual reality technology in e-commerce platforms, in order to provide reference for the virtualization of e-commerce platforms.

Virtual reality technology is a comprehensive technology based on various technologies such as computer graphics, human-computer interaction, and sensing technology. It can bring users into a virtual environment, making them feel as if they are in it. In e-commerce platforms, virtual reality technology can be applied to product display, shopping experience, and other aspects, providing users with a more intuitive and vivid shopping experience [1].

At present, the application of virtual reality technology in e-commerce platforms has gradually been widely applied and promoted. For example, some e-commerce platforms have begun to use virtual reality technology to display products, allowing users to have a more intuitive understanding of the appearance and characteristics of the products; At the same time, some e-commerce platforms have begun to provide virtual fitting functions, allowing users to try different clothing styles without leaving their homes, improving shopping convenience and comfort. In addition, virtual reality technology can also be applied to marketing activities on e-commerce platforms, such as allowing users to visit virtual stores, participate in interactive games, and enhance their sense of participation and loyalty.

However, although virtual reality technology has broad application prospects in e-commerce platforms, there are also some issues that need to be addressed. Firstly, the application of virtual reality technology requires high technical support and cost investment, which may be difficult for some small and medium-sized e-commerce enterprises to bear; Secondly, the application of virtual reality technology also needs to address issues related to user experience and technical standards, such as how to ensure the security and stability of users when using virtual reality technology.

2. Literature review

Virtual reality technology is a new practical technology that includes computer, electronic information, and simulation technology. Its basic implementation method is mainly based on computer technology, utilizing and integrating 3D graphics technology, multimedia technology, simulation technology, etc. There are various definitions of virtual reality technology, and one broad definition holds that virtual reality technology is the simulation of virtual imagination (3D visualization) or real, multi sensory 3D virtual worlds. The literature review of virtual reality technology covers its characteristics, development history, research content, and application prospects. Virtual reality technology is a computer-generated simulation environment that can simulate real-world sensory experiences, including visual, auditory, tactile, and more. In addition, virtual reality technology can also achieve user interaction with the virtual environment through interactive devices. Virtual reality technology has undergone multiple stages of development, from early headsets to current full body sensing devices, constantly moving towards a more realistic and immersive direction. At the same time, the application scope of virtual reality technology is constantly expanding, covering multiple fields such as gaming, education, healthcare, and military. The research field of virtual reality technology is very extensive, including hardware design, software development, human-computer interaction, perception models, and other aspects. Among them, human-computer interaction is one of the important directions in the research of virtual reality technology, and it is necessary to study how to better enable users to interact with the virtual environment. Virtual reality technology has broad application prospects. In the future, with the continuous development of technology, virtual reality technology will be widely applied in various fields, such as gaming, education, healthcare, etc. At the same time, virtual reality technology will also

be combined with other technologies, such as artificial intelligence, cloud computing, etc., to bring people more intelligent and convenient services [2].

The current paper mainly focuses on the application status of virtual reality technology in e-commerce platforms. Review relevant research and elaborate on the widespread application of virtual reality technology in e-commerce platforms, including its use in product display, consumer experience, brand promotion, and other aspects. The implementation of virtual reality technology in e-commerce platforms. Introduce in detail how e-commerce platforms utilize virtual reality technology to achieve product display, including the establishment of 3D models, the construction of virtual scenes, and the interaction between consumers and the virtual environment. The improvement of consumer experience through e-commerce platforms based on virtual reality technology. Evaluate the effectiveness of virtual reality technology in improving consumers' shopping experience, including consumer perception of goods, shopping satisfaction, purchase intention, and other aspects. The challenges and future development of virtual reality technology in the field of e-commerce. Discuss the current challenges faced by virtual reality technology in the e-commerce field, such as technological limitations, high user experience needs, data security issues, etc., and explore possible future development trends.

3. The problems of VR technology in the e-commerce field

Virtual reality technology (VR) is a technology that brings users into a virtual environment, providing users with a more realistic and vivid experience. In the field of e-commerce, the application of VR technology can improve users' shopping experience and participation, but there are also some problems that need to be solved [3].

The application cost of VR technology is relatively high. In order to achieve the effect of virtual reality, high-end hardware devices such as headsets, controllers, etc. are needed, which are expensive and may be difficult for small and medium-sized e-commerce enterprises to afford. In addition, a large amount of manpower, material resources, and financial resources need to be invested to develop and maintain VR applications, which is a huge challenge for some small e-commerce enterprises. Although the price of VR devices has decreased, they still belong to higher consumption. At the same time, it is necessary to configure high-performance computers to ensure smooth VR experience, which also limits the popularity of VR technology. The delay phenomenon in VR experience can affect users' immersion and interaction experience. The current network transmission technology cannot fully meet the needs of real-time interaction, especially when conducting complex operations or large-scale data transmission, the delay phenomenon is more obvious [4]. Most existing VR devices require fixed positions for use, which cannot meet the needs of users to move freely in space, which also limits the design and application of VR scenes.

The application of VR technology requires high technical support. The implementation of virtual reality technology requires knowledge in multiple fields such as computer graphics, human-computer interaction, and sensing technology, so professional technical personnel are needed for development and maintenance. For some small and medium-sized e-commerce enterprises, the lack of relevant technical personnel and experience leads to the inability to develop high-quality VR applications.

There are still issues with user experience and technical standards in the application of VR technology. Due to the need to consider user comfort and security in the implementation of virtual reality technology, discomfort such as dizziness and nausea may occur during the application process. In

addition, there are compatibility issues between different VR devices and platforms, which may cause users to encounter some difficulties when using virtual reality technology.

The application of VR technology still faces legal and privacy issues. Due to the fact that virtual reality technology can record users' movement trajectories, facial expressions, and other information, there may be a risk of leaking user privacy. In addition, some countries and regions still have legal restrictions and regulatory measures for the application of virtual reality technology.

At present, the application of VR technology in the e-commerce field is still in the exploratory stage, and a mature market environment and commercial operation model have not yet been formed. Meanwhile, due to high production costs and high technical barriers, the quantity and quality of high-quality VR content are difficult to meet market demand. The current VR interaction design mostly draws on the experience of the gaming and entertainment fields, but there is a certain gap with the actual needs of the e-commerce field. How to innovate interaction design based on the characteristics of e-commerce, improve user engagement and immersion, is currently an urgent problem to be solved. Long term wearing of VR devices may cause discomfort to the user's eyes, head, and other parts, affecting the user experience and health. Although VR technology can provide realistic virtual scenes and product models, users still cannot truly perceive key information such as the texture and weight of products. This may lead users to doubt the authenticity of the product and affect purchasing decisions.

4. Countermeasures for VR technology in E-commerce platform experience

Virtual reality technology (VR) can provide users with a more realistic and vivid shopping experience in e-commerce platforms, but there are also some issues that need to be addressed. This article will explore the countermeasures of VR technology in the experience of e-commerce platforms from the following aspects:

E-commerce enterprises should strengthen their investment and support in VR technology to improve its quality and user experience. This includes investing more funds and human resources to develop more advanced and stable VR applications, while strengthening the popularization and promotion of VR technology and cultivating more professional talents. Through these measures, the application level of VR technology in e-commerce platforms can be improved, thereby increasing user engagement and loyalty.

E-commerce enterprises should pay attention to protecting users' privacy and rights, and formulate relevant laws and policies to regulate the application of VR technology. For example, strengthening data protection and privacy protection measures to ensure that users do not disclose personal privacy information when using virtual reality technology. At the same time, it is also necessary to strengthen the supervision and management of VR technology to ensure its legal, safe, and reliable application. This can enhance users' trust and satisfaction with VR technology, thereby promoting its widespread application in e-commerce platforms.

E-commerce enterprises should pay attention to the unity of user experience and technical standards. Due to compatibility issues between different VR devices and platforms, users may encounter some difficulties when using virtual reality technology. Therefore, e-commerce enterprises need to consider the compatibility issues of different devices when developing VR applications, and provide a unified user experience and technical standards as much as possible. This can make it more convenient for users to use VR technology, improve their acceptance and usage rate in e-commerce platforms.

E-commerce enterprises should focus on sustainability and ecological benefits. With the continuous development and application of VR technology, its impact on the environment and society is becoming increasingly evident. Therefore, e-commerce enterprises need to promote VR technology while paying attention to environmental protection and social responsibility, and actively participate in sustainable development actions. For example, reducing environmental pollution and energy consumption caused by VR applications, and encouraging users to use environmentally friendly VR devices. This can enhance users' recognition and favorability towards VR technology, and promote the long-term development of VR technology in e-commerce platforms.

The use of VR technology can enable consumers to have a more comprehensive understanding of the product and improve the accuracy of purchasing decisions. For example, when purchasing an electronic product on an e-commerce platform, consumers can wear VR glasses and enter a virtual reality environment to experience the product's working conditions, operating methods, maintenance processes, etc. firsthand, improving the purchasing experience. E-commerce platforms can enhance consumers' experience by improving product display and adding virtual reality elements. For example, by adding a virtual reality experience function to the product details page, consumers can observe product details, materials, etc. more clearly through virtual reality technology, improving the accuracy of purchase decisions. When applying VR technology, attention should be paid to consumer privacy protection. E-commerce platforms should ensure that users' privacy is protected and provide relevant privacy protection policies. E-commerce platforms can enhance consumer education and enhance their understanding and understanding of VR technology through various means. For example, relevant training courses can be conducted, promotional materials can be released, etc.

VR technology has broad application prospects and potential in e-commerce platforms, but at the same time, it also needs to face some problems and challenges. Only through continuous technological innovation, policy guidance, and social consensus can we achieve positive interaction and win-win development between VR technology and the e-commerce industry. E-commerce enterprises should not only strengthen investment and support in VR technology, but also focus on protecting user privacy and rights, improving the uniformity of user experience and technical standards, and emphasizing sustainability and ecological benefits.

5. Conclusion

The application of virtual reality technology (VR) in the e-commerce field can provide users with a more realistic and vivid shopping experience, but there are also some problems that need to be solved. This article explores the current application status, existing problems, and countermeasures of virtual reality technology in the field of e-commerce. The application of virtual reality technology can improve user engagement and loyalty, thereby increasing sales and market share. Although the application cost of virtual reality technology is high, the commercial value and user experience improvement it brings cannot be ignored. Therefore, e-commerce enterprises should allocate resources reasonably based on their actual situation and needs, and gradually introduce VR technology. In order to fully leverage the advantages of virtual reality technology, e-commerce enterprises need to strengthen technological research and talent cultivation. By investing more funds and human resources, we aim to develop more advanced and stable VR applications, improving their quality and user experience. At the same time, it is also necessary to strengthen the popularization and promotion of VR technology, cultivate more

professional talents, and meet the future application needs of VR technology in the e-commerce field. In order to ensure the privacy and rights of users, e-commerce enterprises need to formulate relevant laws and policies to regulate the application of VR technology. For example, strengthening data protection and privacy protection measures to ensure that users do not disclose personal privacy information when using virtual reality technology. At the same time, it is also necessary to strengthen the supervision and management of VR technology to ensure its legal, safe, and reliable application. The application of virtual reality technology also needs to consider sustainability and ecological benefits. With the continuous development and application of VR technology, its impact on the environment and society is becoming increasingly evident. Therefore, e-commerce enterprises need to promote VR technology while paying attention to environmental protection and social responsibility, and actively participate in sustainable development actions.

In summary, the application of virtual reality technology in the field of e-commerce has broad prospects and potential, but at the same time, it also needs to face some problems and challenges. Only through continuous technological innovation, policy guidance, and social consensus can we achieve positive interaction and win-win development between VR technology and the e-commerce industry.

References

- [1] Lin Xu,&Chen Lijuan (2018) Research on CBD Micro Circle E-commerce Platform Based on VR Virtual Reality Technology *Neijiang Technology*, 39 (3), 3
- [2] Jiang Xianmei (2011) Research and implementation of an e-commerce display platform based on virtual reality technology (Doctor dissertation, Jiangxi Normal University of Science and Technology)
- [3] Wang Ruchuan,&Liu Yijin (2001) Research on the New Generation E-commerce Model Based on Virtual Reality Technology *Journal of System Simulation (S2)*, 3
- [4] Wang Mei,&Zhang Haoyu (2020) Research on Digital Museum Exhibition Design and User Experience Based on Virtual Reality Technology *Henan Science and Technology* (17),