Research on Design Innovation of Park Digital Platform Based on Immersive Experience

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Abstract: This article studies the design innovation research of park digital platform based on immersive experience, and proposes the design principles, design innovation, implementation technology, application scenarios, and business model analysis of park digital platform based on immersive experience under the concept of metaverse. Through innovative research on the design of park digital platforms based on immersive experience, this article proposes issues that need to be paid attention to in digital platform design, such as safety, sustainability, user experience, etc., providing certain reference significance for the digital transformation of parks. In the future, the park digital platform based on immersive experience will have broader development space and more innovative possibilities.

1. Research Background

The development trend of the concept of a metaverse, the metaverse is a virtual world that, through the combination of virtual reality technology and internet technology, integrates the real and virtual worlds to create a more realistic and comprehensive digital space. The proposal and development of the concept of the metaverse is based on people's continuous pursuit of digital life and their longing for the virtual world. The development trend of the concept of the metaverse is mainly reflected in the following aspects[1-3]: The metaverse will become a more open and inclusive digital space, where various organizations, individuals, and enterprises can create, share, and exchange digital resources and information[4]; The metaverse will become a more realistic and diverse digital space, and through continuous innovation in virtual reality technology and intelligent hardware technology, more realistic and comprehensive virtual scenes and experiences can be created. The metaverse will become a safer and more intelligent digital space, providing more intelligent and efficient services through technologies such as data mining and machine learning[5-6].

The Current Situation and Development Needs of 2 Park Digital Platforms, with the continuous development of internet technology and virtual reality technology, the digital platform of parks has also been widely applied and promoted. At present, major cities both domestically and internationally are actively promoting the construction of digital parks platforms to improve the service level and management efficiency of parks. The current situation and development needs of park digital platforms are mainly reflected in the following aspects: The digital platform of the park needs to provide more comprehensive and rich service content, including guidance, information

inquiry, entertainment interaction, and other aspects; the digital platform of the park needs to provide more personalized and intelligent services. Through technologies such as big data analysis and artificial intelligence, it can provide users with services that are closer to their needs and preferences; the digital platform of the park needs to improve its security and stability, ensuring the security and stability of user information through technologies such as data encryption and firewall.

Research significance of park digital platform based on immersive experience. The park digital platform based on immersive experience is an important application direction under the concept of metaverse, and its research significance is mainly manifested in the following aspects: The park digital platform based on immersive experience can provide more realistic and comprehensive virtual scenes and experiences, meeting users' exploration and development needs for the virtual world; The park digital platform based on immersive experience can provide more efficient and convenient solutions for park management and services, improving the service level and management efficiency of the park; The park digital platform based on immersive experience can promote the development and application of metaverse concepts, and promote innovation and progress in digital space[7-8].

2. Design Principles of A Park Digital Platform Based On Immersive Experience Under The Concept Of Metaverse

The design principles of a park digital platform based on immersive experience mainly include the following four aspects:

2.1 Diversified Experience

A park digital platform based on immersive experience needs to provide diverse experiential content to meet the needs and preferences of different users. For example, various games and interactive experiences can be provided through virtual reality technology, such as shooting games, role-playing games, etc; Augmented reality technology can also provide an experience that combines with the actual park environment, such as scanning QR codes to view park introductions, participating in virtual tours, and so on. In addition, multiple language voice guided tours, virtual tour guides, and other services can be provided to meet the needs of different users[9-10].

2.2 Scenario-based design

A park digital platform based on immersive experience needs to be designed in a scenario based on the characteristics and cultural background of the park. For example, different virtual scenes and interactive experiences can be designed based on the themes and cultural backgrounds of different parks, such as historical and cultural parks and theme parks. In addition, different game levels and interactive tasks can be designed to meet the different needs and interests of users.

2.3 Personalized Customization

The park digital platform based on immersive experience needs to provide personalized customized services to meet the different needs and preferences of users. For example, data mining techniques and machine learning algorithms can be used to analyze users' historical behavior and preferences, and recommend games and interactive experiences that are suitable for their tastes; Personalized virtual role customization and task allocation services can also be provided to meet the personalized needs of users.

2.4 Intelligent Services

The park digital platform based on immersive experience needs to provide intelligent services to improve user experience and service quality. For example, services such as automatic voice navigation and automatic analysis of user needs can be provided through artificial intelligence technology; Real time data analysis and feedback services can also be provided for timely adjustment and improvement of services. In addition, intelligent hardware technology can also provide a more convenient and comfortable user experience, such as smart glasses, smart gloves, etc.

3. Design Innovation of Park Digital Platform Based on Immersive Experience

The design innovation of the park digital platform based on immersive experience mainly includes the following five aspects:

3.1 Immersive Experience

A park digital platform based on immersive experience needs to provide more realistic, comprehensive, and three-dimensional virtual scenes and interactive experiences to immerse users in the digital world. It can be achieved through virtual reality technology, augmented reality technology, interactive animation technology, and other means. For example, it can provide realistic virtual characters and items, allowing users to interact with characters in the virtual world; augmented reality technology can also be used to achieve an experience that combines with the actual park environment, such as scanning QR codes to view park introductions, participating in virtual tours, and so on.

3.2 Interactive Experience

A park digital platform based on immersive experience needs to provide a more diverse and interactive experience, so that users can feel a real sense of participation and immersion. It can be achieved through gamified design, multiplayer online collaboration, real-time interaction, and other methods. For example, multiple games and interactive experiences can be designed, allowing users to receive rewards and a sense of achievement by completing tasks, participating in competitions, and other means; It can also provide real-time interactive functions, allowing users to participate in interactive games or social activities with other users.

3.3 Digital Experience

The park digital platform based on immersive experience needs to provide a more diverse and innovative digital experience to meet users' continuous pursuit and exploration of the digital world. It can be achieved through virtual art, virtual performances, virtual music, and other methods. For example, multiple virtual art works can be designed to allow users to appreciate art works from around the world; It can also provide digital cultural activities such as virtual performances and concerts, allowing users to enjoy various styles of performances and concerts at home.

3.4 Scene Simulation

A park digital platform based on immersive experience needs to provide more realistic and diverse scene simulations to meet users' needs and interests in different scenarios. It can be achieved by simulating cities, simulating mountains and forests, simulating deserts, and other

methods. For example, multiple different virtual scenes can be designed, allowing users to choose different scenes to experience different virtual worlds; It can also provide scene interaction and experience, allowing users to experience various activities and entertainment items in virtual scenes.

3.5 Personalized Customization

The park digital platform based on immersive experience needs to provide more personalized and intelligent customized services to meet the different needs and preferences of users. By using data mining techniques and machine learning algorithms to analyze users' historical behavior and preferences, we can recommend games and interactive experiences that are suitable for their taste; It can also provide personalized virtual role customization and task allocation services to meet the personalized needs of users.

3.6 Intelligent Services

The park digital platform based on immersive experience needs to provide more intelligent and convenient services to improve user experience and service quality. Can provide services such as automatic voice navigation and automatic analysis of user needs through artificial intelligence technology; Real time data analysis and feedback services can also be provided for timely adjustment and improvement of services. In addition, intelligent hardware technology can also provide a more convenient and comfortable user experience, such as smart glasses, smart gloves, etc.

4. Implementation Technology of Park Digital Platform Based on Immersive Experience

The implementation technology of a park digital platform based on immersive experience mainly includes the following four aspects:

4.1 Virtual Reality Technology

Virtual reality technology is a technology based on computer technology and display technology that brings users into the virtual world through devices such as headsets. Based on virtual reality technology, the digital platform of parks can provide a more realistic and immersive experience. For example, users can visit virtual parks, watch virtual performances, and experience virtual amusement facilities through virtual reality devices.

4.2 Augmented Reality Technology

Augmented reality technology is a technology that combines virtual and real worlds, and projects virtual elements into real scenes through devices such as cameras. Based on augmented reality technology, the digital platform of parks can provide a richer and more diverse experience. For example, users can observe items in the park through a camera and obtain relevant information on the screen, visit virtual museums through augmented reality technology, and participate in virtual museum explanations.

4.3 Intelligent Hardware Technology

Intelligent hardware technology is a technology that collects physiological and behavioral information of users through various sensors, cameras, and other devices, thereby providing more personalized and intelligent services. Based on intelligent hardware technology, the park digital

platform can provide a more intelligent and convenient experience. For example, users can complete tasks through devices such as smart bracelets, observe virtual parks through devices such as smart glasses, and participate in virtual performances.

4.4 Data Mining Technology

Data mining technology is a technique that uses computer algorithms and statistical methods to extract useful information from a large amount of data. Based on data mining technology, the park digital platform can analyze users' historical behavior and preferences, thereby recommending games and interactive experiences that are suitable for their taste. For example, by analyzing data such as users' scores and time spent in the game, we recommend games and interactive experiences that are more in line with their preferences.

5. Application Scenarios and Case Analysis of a Park Digital Platform Based on Immersive Experience

5.1 Application Scenario Analysis

The park digital platform based on immersive experience can be applied to multiple scenes, such as theme parks, tourist attractions, museums, performances, etc. The specific application scenarios are as follows: Theme parks: Provide more realistic and immersive amusement facilities and interactive experiences through digital platforms, such as virtual roller coasters, virtual carousels, virtual dinosaur parks, etc. Tourist attractions: Provide more detailed and rich scenic area introductions and guided services through digital platforms, such as virtual maps, virtual tour guides, virtual exhibitions, etc. Museums: Provide more vivid and intuitive museum exhibition and explanation services through digital platforms, such as virtual exhibits, virtual guides, virtual explanations, etc. Performance: Provide a more realistic and immersive performance experience through digital platforms, such as virtual concerts, virtual concerts, virtual dramas, etc. Sports events: Provide a more interactive and participatory sports event experience through digital platforms, such as virtual live streaming, virtual sports competitions, etc.

5.2 Case analysis

There have been many successful cases of park digital platforms based on immersive experiences, and the following are two of them:

Shanghai Disneyland Digital Platform: The digital platform of Shanghai Disneyland is developed based on virtual reality technology. This platform provides multiple virtual amusement facilities such as virtual reality roller coasters and virtual carousels, allowing users to enter the virtual world and play through devices such as headsets. This platform not only provides a more realistic and immersive gaming experience, but also saves time and costs for tourists.

Digital Platform of Shanghai Science and Technology Museum: The digital platform of Shanghai Science and Technology Museum is developed based on augmented reality technology. This platform projects virtual elements into real scenes through devices such as cameras, allowing users to understand the relevant knowledge of exhibits by observing real scenes and obtaining relevant information on the screen. This platform not only provides a more vivid and intuitive exhibition experience, but also provides more convenient and personalized services for the audience.

6. Business Model Analysis of Park Digital Platform Based on Immersive Experience

6.1 Overview of Business Model

The business model of a park digital platform based on immersive experience mainly includes the following aspects: Business model for content provision: Provide technical content such as virtual reality and augmented reality through digital platforms, as well as digital scene content such as museums and theme parks, and charge tourists subscription fees, experience fees, and other fees. Business model for operational services: Provide operational services through digital platforms, such as virtual tour guides, virtual maps, etc., and collect usage fees from tourists. Hardware Device Business Model: Provide hardware devices such as virtual reality helmets, augmented reality cameras, etc. through digital platforms, sell devices to tourists, and also sell devices to content providers. Data analysis business model: Collect behavior and preference data of tourists through digital platforms for analysis and mining, provide data analysis services for content providers and operation service providers, and charge service fees.

6.2 Business Model Innovation

The park digital platform based on immersive experience can enhance commercial value through the following business model innovations: Integrating multiple scenarios: By integrating multiple scenarios, such as theme parks, tourist attractions, museums, etc., we aim to create a more comprehensive and diverse digital platform and enhance commercial value. Provide personalized services: Through data analysis technology, provide personalized recommendation services and experiences for tourists, improve user stickiness and satisfaction. Provide value-added services: By providing value-added services such as virtual tour guides, virtual catering, etc., improve user experience and consumption frequency. Expanding diversified business models: By expanding diversified business models such as game development and virtual item sales, we aim to increase commercial revenue sources.

6.3 Business Model Case Analysis

The park digital platform based on immersive experience has had many successful business model cases, and the following are two of them:
Beijing Ocean Museum Digital Platform: The digital platform of Beijing Ocean Museum has attracted a large number of tourists by integrating multiple scenes and providing multiple digital scenes such as virtual reality ocean museum and augmented reality ocean museum. This platform not only provides a more realistic and immersive gaming experience, but also provides personalized recommendation and value-added services for tourists, improving user stickiness and consumption frequency. Shenzhen Overseas Chinese City Digital Platform: The digital platform of Shenzhen Overseas Chinese Town has attracted a large number of tourists by providing diverse digital scenes, such as virtual roller coasters and virtual catering. This platform not only provides a more vivid and intuitive experience, but also provides value-added services and expands diversified business models for tourists, increasing the sources of commercial income.

7. The Future Development Trend of Park Digital Platform Based on Immersive Experience

7.1 Overview of Development Trends

The park digital platform based on immersive experience, as a new type of digital platform, is

expected to achieve the following development in the future: Technological upgrading: With the continuous upgrading of technologies such as virtual reality and augmented reality, the park digital platform based on immersive experience will become more realistic and immersive; Diversified applications: The park digital platform based on immersive experience will continuously expand its application scenarios, such as education, healthcare, industry, and other fields, providing more intelligent and personalized services for different industries; Interconnection: The park digital platform based on immersive experience will continuously achieve interconnection with other digital platforms, providing users with more convenient and one-stop services; Data Value Mining: The park digital platform based on immersive experience will use data analysis technology to explore more commercial value and provide users with more accurate and personalized services; Business model innovation: The park digital platform based on immersive experience will continuously innovate business models, providing more business opportunities and profit points for enterprises.

7.2 Future Development Direction

The future development direction of the park digital platform based on immersive experience mainly includes the following aspects: Hardware device upgrade: The park digital platform based on immersive experience will continuously upgrade hardware devices, such as headsets, controllers, etc., to improve user experience. Content diversification: The park digital platform based on immersive experience will continuously expand its content, such as cultural heritage, cutting-edge technology, and other fields, providing more diverse digital scenes. Interactive experience upgrade: The park digital platform based on immersive experience will continuously upgrade the interactive experience, such as social and collaborative aspects, to improve user engagement and satisfaction. Service intelligence: The park digital platform based on immersive experience will continuously provide intelligent services, such as voice recognition, facial recognition and other technologies, to improve service efficiency and accuracy. Application Scenario Expansion: The park digital platform based on immersive experience will continuously expand its application scenarios, such as smart tourism, smart cities, and other fields, providing more intelligent solutions for social development.

8. Conclusion

By analyzing the business model of a park digital platform based on immersive experience, we have drawn the following research conclusions: The park digital platform based on immersive experience can provide a new business model for cultural venues such as parks and museums, while also providing diversified business opportunities for enterprises; The business models of digital platforms, such as content provision, operational services, hardware equipment, and data analysis, can collaborate with each other to achieve innovation and development of diversified business models; In the future, the park digital platform based on immersive experience will continue to upgrade technology, expand application scenarios, upgrade hardware devices, and expand diversified business models, providing users with more realistic and immersive digital scenes, and providing more intelligent solutions for social development.

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