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## Tourism Augmented Reality in China

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### Abstract

The purpose of this paper is to investigate the factors that influence Chinese tourists' behavioral intention to use tourism augmented reality (AR). The application of augmented reality technology in the tourism field is gradually gaining attention, however, there are still some research gaps in the study of tourists' behavioral intention. This study adopts the UTAUT2 (Unified Theory Acceptance and Use of Technology) model and telepresence theory as a theoretical framework and explores the behavioral intention of Chinese tourists to use tourism augmented reality and its influencing factors, taking into account the characteristics of the tourism field. The study also investigates the moderating role of previous experience with AR. This is an empirical study that adopts quantitative method. Firstly, searching domestic and international literature, we summarize the views related to the arguments of this study and analyze the current development of tourism AR in the tourism industry, and comparative analysis using utaut2 and telepresence theory identified the variables that influence willingness to travel, Second, use questionnaire survey method, by collecting questionnaires in online and offline modes and optimizing them based on the results of statistical analysis. The topic of AR in the context of tourism will not have been extensively studied. Given the rapid expansion of the use of AR applications in tourism, there will be a great need to understand its importance for tourists and for users who will be interested in using such applications and those who will be less motivated to use them. Therefore, more research will be able to help develop AR applications in tourism and help understand the requirements of tourists, so this study will aim to clarify the reasons that will influence the intention of customers to adopt such services. It will examine the relationship between UTAUT2 constructs (represented by performance and effort expectancy, social influence, facilitating conditions, and hedonic motivation), telepresence theory (vividness and interactivity), and BI to use tourism AR among Chinese tourists.





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Table 1: Scale of tourists received in China from 2017 to 2023

Year	Inbound Trips (Million)	Inbound Revenue (USD Billion)	Outbound Trips (Million)	Domestic Trips (Billion)	Domestic Revenue (CNY Trillion)	Total Revenue (CNY Trillion)
2017	139.48	123.4	130	5.001	4.57	N/A
2018	141.2	127.1	149.72	5.539	5.13	5.97
2019	145.31	131.3	154.63	6.006	5.7	6.63
2020	N/A	N/A	N/A	3.43	2.76	N/A
2021	N/A	N/A	N/A	3.43	3.02	N/A
2022	N/A	N/A	N/A	3.98	3.81	N/A
2023	90	N/A	N/A	4.55	4	N/A

### The Current Trends of Tourism Industry

With the development of a series of new-age information technologies, it is becoming increasingly evident that technology is changing the face of tourism. Among them, the new technology of the extended reality category represented by augmented reality technology has an important impact on tourists' tourism experience because of its characteristics of combining virtual and reality. In the proposal of the Party Central Committee on the 14th Five-Year Plan, it is mentioned to promote the deep integration of tourism and other modern service industries with advanced manufacturing industries, and promote the digital development of service industries. The application of augmented reality technology in tourism product development is a typical representative of the digital development of tourism, and in 2020, the Ministry of Culture and Tourism proposed to promote technological innovation and application in tourism, and made "developing immersive industry" one of the eight new types of digital cultural industry to be cultivated (Xie Xuefang, Chen Si, 2021), and at the same time proposed to enhance the strength of digital culture equipment, and the technical level of immersive facilities, wearable devices and other augmented reality technology equipment was put on the agenda (Li, Fengliang, Gu, Zhenjing, 2021). The policy guidance reflects the government's emphasis on technology to enhance the quality of the service industry, and also stimulates the academic community's research enthusiasm on the application of augmented reality technology in tourism. Augmented Reality (AR) mentioned in this paper is a technology that superimposes virtual objects in real space and maps virtual information in the real



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environment (Zhou Zhong, Zhou Yi, Xiao Jiangjian, 2015). In the process of tourism digitalization, augmented reality technology has the advantages of being able to drive the development of smart tourism and empower tourism products, and should be given sufficient attention in the process of smart tourism development, thus bringing a new paradigm of tourism product demand and development for tourism (Wang Shuang, 2021).

However, the augmented reality technology in tourism is still in its infancy, and there are still few scholars involved in research fields related to the impact factors and mechanisms of its application effectiveness (Dai, Keqing, Chen, Wanming, 2019). Especially in the industry practice, the use of augmented reality technology and traditional tourism resources superimposed fusion of innovative technology tourism product development for the traditional tourism product development concept formed a huge impact. However, research on the application of augmented reality technology has focused on tourism education and tourism marketing, focusing on the specific details of technology application, and less research has been conducted on factors that can indicate the degree of acceptance of augmented reality technology by tourists, such as their use behavior of augmented reality technology. At present, research on the use behavior of augmented reality technology is focused on education, publishing and other fields. Accordingly, this paper will explore the conditions that influence tourists' use behavior of augmented reality technology applications, starting with augmented reality tourism products, so as to provide suggestions for tourism industry practices.

**Tourism Augmented Reality**

As consumption in the cultural tourism category has escalated in recent years and user demand for immersive and experiential cultural products has increased, augmented reality (AR) has developed into one of the most popular technological innovations: a project that has the potential to impact the tourism industry. Augmented Reality (AR), a technology that combines virtual information with the real world, using multimedia (animation), 3D modeling, real-time tracking and registration, intelligent interaction, sensing and other technical means to simulate virtual information and then apply it to the real world. The application of augmented reality to travel and tourism brings a new consumer behavior experience and a new marketing service model to travel companies. It is estimated that the tourism service industry accounts for 10% of the global gross domestic product (GDP) and one tenth of jobs (World Tourism Organization, 2018), and according to the World Economic Forum (2017), the total value of tourism-related virtual industries will reach \$200 billion by 2027. Although



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affected by the impact of the epidemic, the development scale of the online travel industry online transaction market in China gradually shrinks in 2020, decreasing by nearly 50% compared to 2019.

Augmented tourism features an immersive and realistic experience for consumers, enriching their multiple senses and creating an immersive and immersive experience for users. It can be said that the emergence of immersive augmented reality technology has fundamentally changed the user experience, and as Liu Enbo suggested, compared with traditional methods, virtual reality technology can bring a higher quality tourism experience for tourists and present a good destination image for them, thus effectively promoting the development of tourism. Therefore, strengthening the virtual reality technology in the tourism industry not only helps to improve the service quality and market share of tourism products, but also can greatly improve the development of China's tourism market wisdom.

**Issues of Tourism Augmented Reality in China**

According to a new report from Strategy Analytics, the consumer AR endpoint market revenue size tripled between 2020-2021, and the global market for dedicated AR headset devices is expected to ship close to 60 million units by 2027.

Currently, research on augmented reality in tourism has focused more on the importance of augmented reality use, technology features, and development strategies, while empirical studies on factors that influence tourists' use of augmented reality and how augmented reality affects tourists' travel intentions are slightly lacking. In the past few decades, academics have generally adopted technology acceptance models to explain the factors that influence individuals' acceptance and use of new technologies. However, recent research suggests that technology acceptance models should have more power to explain individuals' attitudes and intentions to use technology by adding additional variables. Personality traits are central to the formation of individuals' attitudes and behavioral intentions and have a significant impact on technology acceptance and user behavior.

However, there is still limited research on the impact of personality traits on technology use, yet personality traits are extremely important to individuals' use of new technologies. In a tourism environment, without a true understanding of the personality factors that influence the use of new technologies and the attitudes and intentions of tourists towards the use of new technologies, the potential of new technologies for tourism services cannot be fully realized, and the stimulating effect of new technologies on tourists' travel intentions cannot be achieved, and even the supply of tourism products becomes wasteful, so it is





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has injected new energy into tourism development, and encouraging tourists to accept and use augmented reality and creating personalized experiences for tourists has become a new driving force for tourism organizations and attractions to innovate and develop.

This paper analyzes the factors that influence tourism AR willingness and behavior, integrates telepresence theory and the UTAU2 theoretical model, understands the factors that promote and hinder the acceptance and use of tourism AR by Chinese tourists through six variables, and provides feasible suggestions for the development of tourism AR in the Chinese tourism industry. A questionnaire survey was conducted to further understand the influence of various factors on tourism AR use and to improve tourists' acceptance of tourism AR.

### Conclusion

This study aims to investigate the factors influencing Chinese tourists' behavioral intentions to use tourism Augmented Reality (AR) technology. With tourism attractions facing significant challenges, the necessity for remote collaboration, e-commerce, and data-driven approaches highlights the industry's urgent need for digital transformation. Additionally, bridging the gap between physical reality and digital virtual experiences presents a major pain point and opportunity for the tourism industry. This chapter focuses on the introduction of AR technology into the tourism sector and its vast potential to enhance tourist experiences, promote smart tourism, and benefit the industry at large.

By adopting the UTAUT2 (Unified Theory of Acceptance and Use of Technology) model and telepresence theory as theoretical frameworks, this research explores the behavioral intention of Chinese tourists towards using tourism AR, considering the unique aspects of the tourism domain. This includes examining how AR technology can enrich tourists' experiences by providing interactive and immersive encounters with cultural, historical, and natural sites.

The potential of AR technology in transforming the tourism industry is considerable. It promises not only to offer tourists richer and more interactive experiences but also to drive the industry towards a future of smart tourism. The study delves into the current development, status, and policies of tourism AR in China, discussing its general benefits for Chinese tourists.

The research employs a quantitative methodology, starting with a review of both domestic and international literature to summarize relevant viewpoints and analyze the current development of tourism AR. This approach aids in identifying variables that influence travel intentions through comparative analysis using the UTAUT2 and telepresence theory.





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