

# Research on the Design of Innovative Play Blind Box Based on AR Digital Technology Empowering Traditional Intangible Cultural Heritage

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**Abstract:** The development of science and technology, especially the rise of augmented reality (AR) technology provides a new way for the inheritance and innovation of traditional intangible cultural heritage. Based on the design and research of the tide play blind box of AR digital technology empowering traditional intangible cultural heritage, this paper discusses the application and feasibility of AR technology in the traditional intangible cultural heritage, analyzes the strategy of implementing AR technology empowering intangible cultural heritage, and puts forward corresponding countermeasures for the challenges that may be faced, aiming at providing new ideas and methods for traditional intangible cultural heritage and modern science and technology.

**Keywords:** Augmented reality technology; Intangible cultural heritage; Inheritance; Innovation

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## 1. Introduction

### 1.1. Current situation of intangible cultural heritage

China has rich intangible cultural heritage resources, including 900,000 intangible cultural heritage items, 1,372 national intangible cultural heritage items, and 11,042 provincial intangible cultural heritage items. However, there are very few intangible cultural heritage projects facing industrial development, which shows the difficulties in developing and inheriting intangible cultural heritage. The main challenges include the conservative thinking of the inheritors, the lack of policy and financial support, the lack of professional talents, and the disregard of the contemporary youth for the intangible cultural heritage. These factors restrict the dissemination and development of the intangible cultural heritage <sup>[1]</sup>.

### 1.2. The blind box trend

As a new consumption model, blind boxes are popular among young people due to their mysterious nature <sup>[2]</sup>. Market research reports show that the outbreak of the trendy play industry began with art, started with IP derivatives, and flourished with blind boxes, reflecting consumers' pursuit of new lifestyles and consumption characteristics <sup>[3]</sup>.

### 1.3. Significance of combining intangible cultural heritage with blind boxes

The project combines intangible cultural heritage with blind box by combining augmented reality technology (AR technology) to create a new product with educational significance and entertainment. The launch of Wanyue blind box aims to spread and inherit the excellent traditional Chinese culture while meeting the needs of modern consumers for novel experiences <sup>[4]</sup>.

### 1.4. Significance of the research

#### (1) Application of AR technology in the inheritance of traditional intangible cultural heritage

The introduction of AR technology provides a new way for the display and dissemination of intangible cultural heritage. Through virtual technology, the intangible cultural heritage is “alive,” so that the intangible cultural heritage can be presented to the public more vividly and intuitively, especially to the younger generation <sup>[5]</sup>.

#### (2) Innovation value in the trendy play industry

Combining AR technology and intangible cultural heritage, the Wanyue blind box project has obvious innovation in the trendy play industry. It is not only a simple collectible, but also a kind of cultural transmission and a new way of interactive experience. Through the Wanyue blind box, it can stimulate young people’s interest and understanding of intangible cultural heritage, and promote the inheritance and development of intangible cultural heritage <sup>[6]</sup>.

## 2. Feasibility analysis based on today’s market

Generation Z’s consumption style and psychological demand style are quite different from those of the previous generation. They are more focused on spiritual satisfaction and emotional sustenance. Trendy play has become a popular choice to highlight the personality, lifestyle, and attitude of young people. Trendy Play has also become an emotional outlet for young. Generation Z is also more focused on quality, innovation, tradition, and appearance. There is such an environment casting the emergence of the blind box market <sup>[7]</sup>.

The blind box economy is a marketing model that uses blind box packaging to stimulate a series of consumer activities <sup>[8]</sup>. In 2015, 37% of purchases in China’s anime-related consumption projects were of figurine models. Data shows that the number of core users of trendy toys and other “anime-related” products has risen from 49.84 million to 80 million. Currently, the market size for trendy toys and related products has exceeded 100 billion yuan, and this figure is expected to grow exponentially in the future. Blind boxes and the “trendy toys” behind them have become an emerging blue ocean market. Today, the craze for blind box toys in China has become an industry and cultural phenomenon that cannot be ignored <sup>[9]</sup>.

With the maturity and popularization of AR technology, its application in the heritage of intangible cultural heritage has become more and more feasible. Through continuous research and development and optimization, Zhuhai Speed Technology Co., Ltd. has mastered stable and reliable AR technology, which can accurately overlay virtual information into the real world and provide users with high-quality intangible cultural experience <sup>[10]</sup>. At present, the public’s interest in traditional culture is growing, especially the younger generation, which has a strong demand for novel and interesting cultural experiences. By merging AR technology with intangible cultural heritage, Zhuhai Speed Technology Co., Ltd. has introduced products and services that effectively cater to this market demand and hold promising market potential <sup>[11]</sup>.

The core value of the Trendy Play blind box, enhanced by AR digital technology, is to use the “Internet+” concept to integrate traditional intangible cultural heritage, often overlooked by contemporary youth, with their favorite blind box products. This approach addresses the issue of trendy play items becoming mere decorations

or photo props after the initial unboxing excitement <sup>[12]</sup>. The product's development aims to transform trendy play from mere decorative objects into interactive experiences. By combining these products with the imagery of intangible cultural heritage inheritors and leveraging the strong appeal of AR technology, the blind boxes serve as a medium to promote and preserve traditional Chinese intangible cultural heritage.

### **3. Theoretical framework and research methods**

#### **3.1. Theoretical framework**

(1) The inheritance significance of intangible cultural heritage

Intangible cultural heritage is often referred to as the “living fossil” of history and culture, as well as “the backbone of national memory.” Amid economic development, many remarkable examples of intangible cultural heritage are at risk of extinction. Consequently, preserving intangible cultural heritage is crucial for maintaining national cultural identity and diversity <sup>[13]</sup>.

(2) Market characteristics of blind box play

As an emerging consumption model, blind boxes are popular among young people due to their element of surprise. The growth of the trendy play industry mirrors consumers' pursuit of new lifestyles and consumption patterns. Among these, the blind box market is gradually becoming one of the core segments of global consumption <sup>[14]</sup>.

(3) Current status of AR technology

Augmented reality (AR) technology provides a new way of interaction by integrating real world information and virtual world information seamlessly. The development of AR technology provides a new way for the display and dissemination of intangible cultural heritage, which makes intangible cultural heritage “living” and present to the public in a more vivid and intuitive way <sup>[15]</sup>.

#### **3.2. Research methods**

(1) Case study

Through a detailed analysis of the Wanyue blind box project, we explore its innovative model and impact. By integrating AR technology, the project combines intangible cultural heritage with blind boxes, creating a new product that offers both educational value and entertainment.

(2) Market research

Collecting relevant market data and consumer feedback is crucial for understanding market demand and consumption trends. Survey results reveal that Generation Z consumers are primarily interested in blind boxes due to the excitement they provide and their collectible value.

(3) User feedback

Through questionnaires and user interviews, we gathered users' experiences and suggestions for improving the Wanyue blind boxes. The survey results indicated that consumers did not possess a deep understanding of intangible cultural heritage but expressed significant interest in integrating it into the blind boxes.

### **4. Product design and core values**

#### **4.1. Product design**

(1) Design concept

Combined with traditional intangible cultural heritage and modern trendy play elements, the blind

box is given new vitality through AR technology, making it not only a collection but also a carrier of cultural heritage.

(2) 3D modeling

3D modeling technology is employed to depict classic moments of intangible cultural heritage, ensuring that the characteristics of intangible cultural heritage are integrated into the model and animation of the “Wanyue spirit” (the trendy play character).

(3) AR interactive module

AR technology is utilized to enable interaction with the user, allowing the “Wanyue spirit” to come to life on the user’s mobile phone or tablet computer, thereby enhancing the user experience.

## 4.2. Product innovation

(1) A distinctive product image is crafted by blending elements of intangible cultural heritage with trendy play.

(2) AR technology is employed to enhance user interaction, elevating both the appeal and educational value of the products.

(3) An exclusive social platform is developed to foster an interactive community between users and the “Wanyue spirit.”

## 4.3. Core values

(1) Displaying intangible cultural heritage

Through the Wanyue blind box, the intangible cultural heritage will be presented to the young generation in a novel way, and promote the inheritance and development of intangible cultural heritage.

(2) Enhancing user experience

The application of AR technology enables users to interact with the Wanyue spirits through mobile phones or tablets, providing a new consumer experience.

(3) Combine culture and technology

The Wanyue blind box project integrates traditional culture and modern technology, shows the possibility of cultural innovation, and promotes the modern dissemination of intangible cultural heritage.

(4) Stimulating young people’s interest

The fusion of intangible cultural heritage and trendy play elements sparks the curiosity and interest of young people in the former, thus facilitating the dissemination of culture.

## 5. Combining AR technology and intangible cultural heritage

### 5.1. 3D modeling stereotyped intangible cultural heritage

3D modeling technology is employed to actualize the movements of the “Wanyue spirit,” an online virtual character developed from the Wanyue blind box. Classic actions and scenes from the operation of intangible cultural heritage are depicted. AR technology enhances the realism of the “Wanyue spirit,” making it akin to a physical entity that surrounds users. This approach boosts user engagement with intangible cultural heritage.

### 5.2. AR interactive module

An AR app is developed using Unreal Engine, which transforms the Wanyue blind box into the “Wanyue spirit” that interacts with users. By integrating images representing intangible cultural heritage, we utilize the engaging nature of AR technology to promote the inheritance and dissemination of valuable aspects

of Chinese traditional culture.

### **5.3. Intangible cultural heritage display**

Our dedication lies in seamlessly blending intangible cultural heritage into the “Wanyue” trendy play products. Through the utilization of AR technology, we aim to showcase this heritage, providing young people with the opportunity to engage with it firsthand, thereby fostering interest and achieving the goal of inheritance and dissemination.

### **5.4. Virtual box unpacking and identity card collection**

Consumers have the option to virtually unwrap the blind boxes through an online box drawing machine or other methods, enabling them to preview the identity information card of Wanyue. By collecting this information, they can gain insights into the blind box products showcased by Wanyue, including details about their intangible cultural heritage background, origin, techniques, and cultural significance.

### **5.5. Product innovation**

The Wanyue project effectively addresses the shortcomings of the current trend play blind box doll image, which lacks depth, offers a limited presentation mode, and suffers from oversaturation. By infusing elements of Chinese intangible cultural heritage, integrating AR interactive features, introducing newly designed intellectual property (IP), and addressing industry challenges directly, we have introduced an AR intangible cultural heritage blind box to the market.

## **6. Organization and management of product operation**

### **6.1. Company structure and functions**

Zhuhai Speed Technology Co., Ltd. adopts a structured project organization and management approach, consisting of several key centers. The Administrative Management Center oversees financial management, staff training, and personnel management. The Technology Research and Development Center is tasked with new product development, technology innovation, and system maintenance, ensuring that interfaces, performance, and functions align with specifications outlined in manuals. The Business Cooperation Center manages e-commerce partnerships, offline investment promotion, and sales channel oversight. The Marketing Center handles data analysis, event planning, and promotional activities. Finally, the Operation Customer Center oversees art design, online retail, order processing, and after-sales services.

### **6.2. Company management mechanism**

The company strictly adheres to relevant laws, regulations, industry standards, and norms, ensuring their earnest implementation. It places importance on the subjectivity of employees, encouraging their participation in daily management and decision-making processes, and offers physical rewards and honorary titles to those who propose reasonable suggestions. Implementing the “post-salary system” ensures fair compensation for employees, complemented by corresponding benefits and improvements in all aspects of employee treatment in tandem with the company’s enhanced economic efficiency. Furthermore, the company advocates for a strict economy, and pragmatism, against extravagance and waste, while fostering a culture of collective creativity, solidarity, and teamwork among its staff, aiming to enhance the company’s centripetal force and cohesion.

### **6.3. Human resource management**

Human resource operations in each department of the company must adhere to national laws and local regulations. Relevant matters shall be handled within the framework outlined by these laws and regulations. The company implements a contract management system, requiring both the company and employees to sign labor contracts and adhere to their contents. The human resources department is responsible for human resource planning, employee welfare, assessment, and training, as well as carrying out procedures related to termination, expulsion, resignation, hiring, and admission of employees in accordance with relevant regulations.

## **7. Conclusion**

Human resource operations in each department of the company must adhere to national laws and local regulations. Relevant matters shall be handled within the framework outlined by these laws and regulations. The company implements a contract management system, requiring both the company and employees to sign labor contracts and adhere to their contents. The human resources department is responsible for human resource planning, employee welfare, assessment, and training, as well as carrying out procedures related to termination, expulsion, resignation, hiring, and admission of employees in accordance with relevant regulations.

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