

# *The Status Quo and Development Strategy of Tourism Cultural and Creative Products Based on Blockchain Technology in the IP Era—A Case Study of Zhuhai City*

Jie Ding<sup>1,a</sup>, Zhihua Lai<sup>1,b</sup>, Yingzhi Ye<sup>1,c</sup>, Qian Chen<sup>2,d,\*</sup>

<sup>1</sup>School of Literature, Zhuhai College of Science and Technology, Zhuhai, Guangdong, China

<sup>2</sup>School of Logistics Management and Engineering, Zhuhai College of Science and Technology, Zhuhai, Guangdong, China

<sup>a</sup>903339325@qq.com, <sup>b</sup>1979955145@qq.com, <sup>c</sup>1579005613@qq.com, <sup>d</sup>chenqian@zcst.edu.cn

\*Corresponding author

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**Abstract:** Blockchain technology, with its unique characteristics of decentralization, transparency and immutability, provides revolutionary opportunities for the development of information technology. For China's booming cultural and creative industries, the application of blockchain technology means a profound change, which is expected to provide unprecedented solutions and solutions for industrial innovation. In the current industrial environment, China's cultural and creative industry is facing multiple challenges, such as the high homogeneity of product design, the lack of brand awareness of cultural and creative products, and the imperfect development of cultural and creative market. By investigating the current situation of tourism cultural and creative products in Zhuhai, and exploring the deep integration of the three key mechanisms of blockchain with the tourism and cultural industry in Zhuhai, this paper studies the new development strategy of regional cultural and tourism products, so as to provide some inspiration and reference for the in-depth study of "blockchain + cultural industry" in the future.

## 1. The Technical Logic of Blockchain

### 1.1 Three Key Mechanisms of Blockchain Technology

**Distributed Consensus Mechanism:** Blockchain solves the trust and consistency problems in decentralized networks through a distributed consensus mechanism. Consensus mechanisms ensure that participants agree on the validity and order of transactions to avoid malicious behavior and data tampering. Common distributed consensus mechanisms include Proof of Work (PoW), Proof of Stake (PoS), and Delegated Proof of Stake (DPoS).

**Distributed Storage and Data Structures:** Blockchain stores data in the form of blocks and uses a chain structure to connect the blocks together to form an immutable data record. Each block contains transaction information and the hash value of the previous block, ensuring data integrity and traceability. The distributed storage of blockchain enables data to be backed up on multiple

nodes in the network, improving the reliability and resistance of the system to attack.

**Cryptographic Algorithms and Mechanisms** - blockchain uses cryptographic algorithms to protect the security and privacy of data. Encryption algorithms are used to encrypt transactions and data, ensuring that only authorized participants can decrypt and access the data. The digital signature mechanism is used to verify the authenticity and integrity of the transaction, and ensure the identity of the transaction and prevent tampering through private key signature and public key verification. Other cryptographic mechanisms such as hash functions and Merkle trees are also widely used in blockchain.

Together, these key mechanisms form the basis of blockchain technology and provide it with features such as decentralization, security, and reliability. Depending on the specific blockchain platform and application scenario, the implementation of these mechanisms and algorithms may vary.

## **1.2 The Value of Blockchain Technology in the Process of Cultural and Creative Product Development**

Blockchain technology provides the value of transparent creative process, data security and anti-counterfeiting, incentive mechanism and user participation, decentralized distribution and dissemination, disintermediated trading platform, and data security and anti-counterfeiting for the cultural and creative product development process.

**Transparent creative process.** Blockchain can record the creative process and history of cultural and creative products, making them transparent and verifiable. Creators can record information such as the creative process, sources of inspiration, and modification records on the blockchain, adding story and authenticity to the product and enhancing users' trust in the product.

**Data security and anti-counterfeiting.** The immutable and distributed characteristics of blockchain can ensure the security and anti-counterfeiting ability of cultural and creative product data. Creators can use blockchain to verify the authenticity and originality of products and prevent piracy and infringement.

**Incentives and user engagement.** Blockchain can encourage users to participate in and contribute to cultural and creative products through token economic models and incentive mechanisms. Users can earn token rewards by participating in content creation, product promotion, community building and other ways to enhance user engagement and loyalty.

**Decentralized distribution and dissemination.** Blockchain can provide a decentralized distribution and dissemination channel for cultural and creative products. Creators can publish their work directly to the blockchain, and users can access and communicate their work through a blockchain browser or app, enabling more free and open content distribution.

**A disintermediated trading platform.** Blockchain can build a disintermediated transaction platform, enabling direct interaction and value exchange between creators and users. With smart contracts and cryptocurrencies, fast, secure and non-third-party transactions can be achieved, reducing transaction costs and improving transaction efficiency.

These characteristics can enhance the trust, creativity and market competitiveness of cultural and creative products, and bring new opportunities for the development of cultural and creative industries.

## **2. Investigation on the Current Situation and Needs of Cultural and Creative Development in Zhuhai**

### **2.1 Steady Expansion of Zhuhai's Cultural Tourism Industry**

Zhuhai has a rich cultural heritage and numerous local traditional cultural resources with distinctive features, as well as resources related to red revolutionary history. With the implementation of the national rural revitalization policy in recent years, many villages have developed unique industries and agriculture based on regional characteristics. Utilizing these as source materials for cultural and creative products not only injects creativity into product innovation, but also promotes local cultural revitalization, agricultural brand building, and empowerment of the tourism industry. Products with local traditional cultural characteristics or red revolutionary stories can enhance the promotion of traditional culture, local cultural dissemination, and red culture education for young people, thereby playing a role in educational transmission. Facing the trend of steady expansion in Zhuhai's cultural tourism industry, there is a common aspiration for its future development: firstly, to promote cultural tourism by deeply exploring Zhuhai's local charm elements from historical, modern, folk, and ethical perspectives to build high-quality cultural and tourism brands. Second, Zhuhai creates a new IP of cultural tourism with cultural characteristics, brand core and unique value. Third, through "culture + tourism", Zhuhai develops tourism service products that are in harmony with the advantages of urban development, deepens the excavation of urban cultural heritage, and empowers urban development.

### **2.2 Existing Issues of Regional Cultural and Creative Products**

#### **2.2.1 Serious Homogenization in Product Design and Lack of Innovation Awareness**

In the development of regional cultural and tourism industries, there is a problem of insufficient utilization of local resources, leading to product homogenization issues that affect the diversity and individuality of local cultural and creative products, thereby hampering industry development. Severe homogenization and lack of innovation, failure to fully tap into regional cultural resources, make it difficult to attract tourist consumption or even hinder their understanding of regional culture.

#### **2.2.2 Lack of Brand Awareness in Cultural and Creative Products**

Due to the cultural industry being in its early stages and insufficient integration of local resources, limited development levels result in weak brand awareness. This leads to fewer economies of scale, a short product development chain, and a lack of a series of brand-centered derivative products, which impacts the realization of economic and social benefits, hampering regional economic revitalization. Therefore, there is a need to strengthen brand building.

#### **2.2.3 Market Development Issues for Cultural and Creative Products**

Clear market positioning and selection facilitate the entry of cultural and creative products into the market and promote cultural revitalization. Due to conservative traditional concepts, imperfect hardware facilities, inadequate protection of regional traditional culture, failure to activate cultural resources, and incomplete communication mechanism, many regions do not make full use of new media platforms for extensive dissemination, which affects cultural output. Therefore, it is necessary to establish a sound dissemination mechanism [1].

### 3. Public Demand for Zhuhai's Characteristic Cultural and Creative IP Products

#### 3.1 Degree of Favorability towards Zhuhai's Cultural and Creative Products at Different Ages

This survey was conducted by distributing questionnaires to students, office workers, and individual business owners. The majority of respondents were under 35 years old, with individual business owners generally aged between 35-50 (Figure 1). Most students, office workers, and individual business owners, even non-locals, showed interest in Zhuhai's cultural and creative products (Figure 2). Local students and office workers were interested in local cultural and creative products, but individual business owners generally showed no interest (Figure 3). While most respondents believe that current cultural and creative products on the market can meet their needs, approximately one-fourth feels otherwise (Figure 4). Reasons for lack of interest in cultural and creative products include inadequate promotion leading to low dissemination, limited understanding due to lack of mass promotion, and perceptions of cultural products as intangible. Factors such as memorability, price rationality, portability, and collectible value also play significant roles in purchase decisions. National promotion efforts are needed to facilitate sustainable development.

Age and occupation

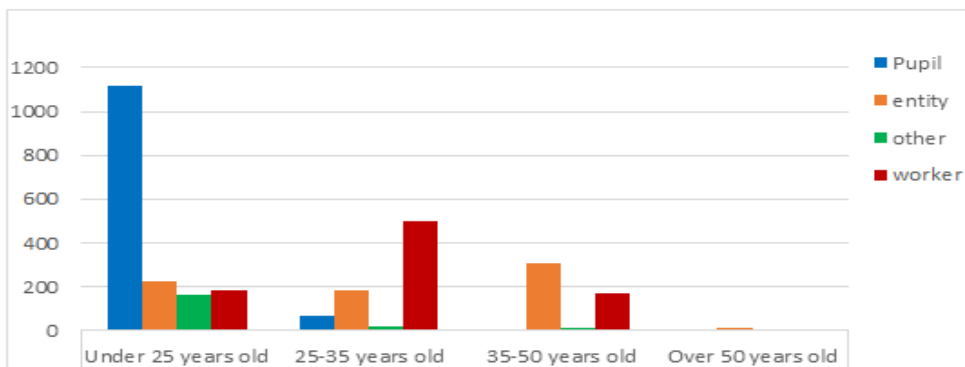


Figure 1: Age and occupation

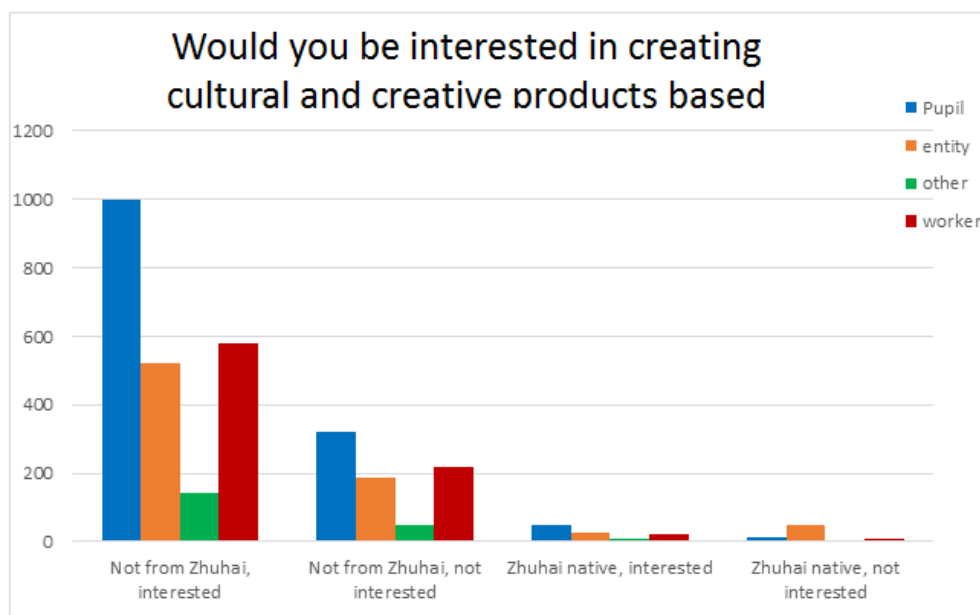


Figure 2: Would you be interested in creating cultural and creative products based

### 3.2 Analysis of the Popularity of Cultural and Creative Product Categories

Through surveys, it was found that respondents were more interested in cultural products related to famous scenic spots and unique resources, while red cultural themes were less favored. This is partly due to the limited presence of red revolutionary history in Zhuhai compared to its renowned island tourism industry, with most people visiting famous sites such as Riyue Bay, Fisher Girl, and Dong'ao Island when in Zhuhai. The majority of respondents wish to understand the production process and background stories of products, as these narratives and processes are important added values for cultural and creative products rooted in culture - a factor that attracts users.

Due to the diverse aesthetic views of the public, cultural and creative products should demonstrate greater inclusivity and diversity to meet the needs of various groups. This approach allows more people to appreciate the charm of culture while maintaining unique characteristics and innovating within tradition in cultural and creative products."

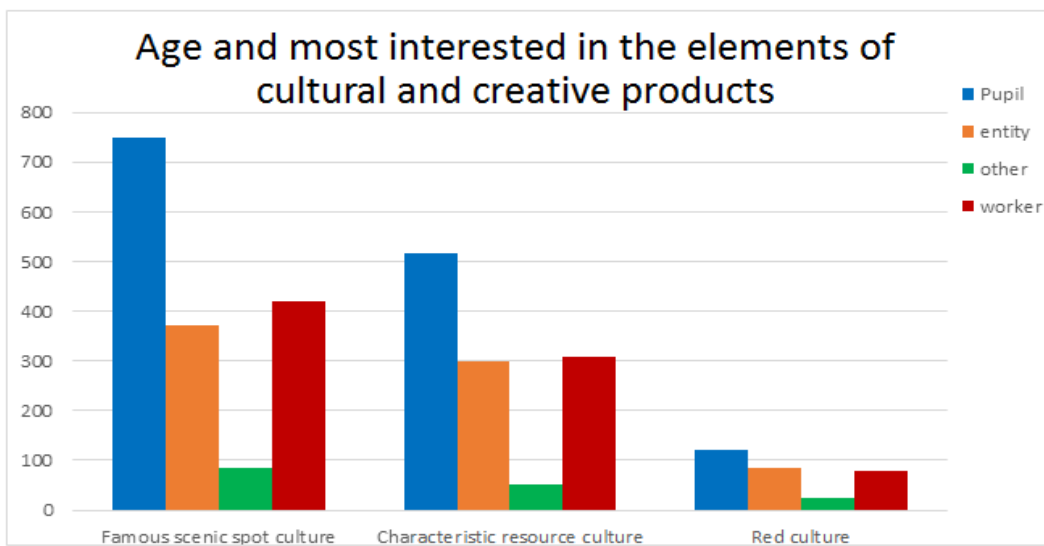


Figure 3: Age and most interested in the elements of cultural and creative products

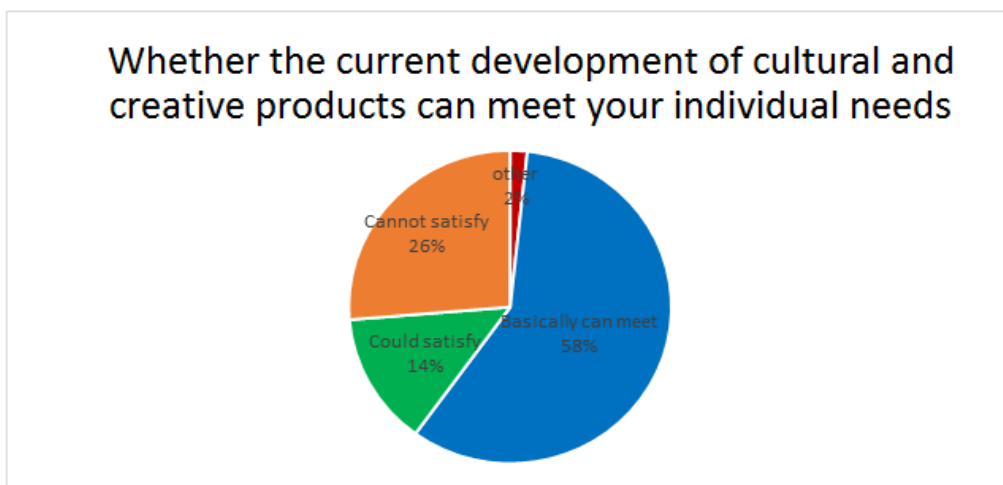


Figure 4: Whether the current development of cultural and creative products can meet your individual needs

## **4. The Research Focuses on the Principles of Blockchain Technology and the Development Strategy for Integrating Cultural and Creative IP Market**

### **4.1 Enhanced Investigation and Identification of Potential Intellectual Property Assets in Zhuhai**

Situated on the west bank of the Pearl River, Zhuhai possesses a distinctive allure within the radiant Bay Area, swiftly drawing individuals from across the nation to reside, work, and thrive here. This vast land contains rich cultural deposits, and the intangible cultural heritage has precipitated profound Chinese cultural connotations and exudes strong Chinese elements. With rich cultural resources and efficient scientific and technological level, Zhuhai has a huge potential for the development of cultural and creative products, which can show its unique charm on the modern design stage.

With the improvement of people's consumption level and aesthetics, the demand for cultural and creative design with Chinese characteristics is also growing. Therefore, we need to identify the trends of the IP era and deeply understand the characteristics of IP: identifiability, convertibility, scalability, and sustainability. In order to enhance the recognition of IP, the unique culture of Zhuhai can be combined with the IP of scenic spots, the core culture of tourist spots can be transformed into cultural and creative IP, and related products can be designed [2]. These products, together with scenic spots, constitute the core IP and are interrelated, which promotes the integrated development of tourism and cultural and creative products, and promotes the prosperity of tourism and cultural and creative products. The use of cultural and creative products to create city business cards, for urban tourism brand building, urban cultural and creative product development, urban environment improvement to bring positive significance. Establishing a unique cultural IP based on the city's own characteristics can make tourists' perception of the tourist destination clearer, facilitate promotion and publicity, and thus attract tourists to go. Designers should study and study deeply, explore and extract the potential IP resources of Zhuhai city, dig deep into the cultural connotation of Zhuhai resources, innovate and create humanistic and ecological resources, and form high-quality tourism projects with Zhuhai characteristics and IP cultural and creative products favored by tourists. The design of any product is inseparable from the support of the masses. When mining resources, it is necessary to stand in the perspective of the masses as a reference point, based on regional characteristics and cultural heritage, cater to the aesthetic standards of the masses, discuss according to their preferences, and strive to design more works favored by the masses under the premise of innovation-driven development strategy. To promote the development prospects of related industries. Chinese culture is extensive and profound, and local development has led to the continuous improvement of the country's international status, so that it can have more and more important say. Meanwhile, it is hoped that more people can invest in cultural construction and offer suggestions for the economic development of various regions [3].

### **4.2 Consensus Mechanism - DPoS Encourages Creation to Drive the Development of Cultural and Creative IP**

Blockchain technology helps to establish a unified IP copyright management system by building a cross-regional, cross-industry and cross-media copyright trading platform. Under this technical framework, the consensus mechanism has become a key element, which is the core mechanism for reaching information consensus among nodes in all blockchain network systems, and realizes the unity of information among nodes in the whole network. The concrete form of the consensus mechanism can be realized through the DPoS mechanism, which incentivizes the creative community and encourages nodes to perform their duties better according to node ranking. The

dedicated block producer is responsible for copying and verifying the transaction information on the chain, and it is decided by the voting of all nodes, and the candidate node with the highest vote will be eligible for the production block. The cultural and creative audience will form a close connection with the cultural and creative group, so that the cultural and creative group will continue to produce the local cultural and creative IP image of Zhuhai.

Explore the development mode of integrating the principle of blockchain technology with the cultural and creative IP market. By improving the development environment of the cultural and creative industry, we can stimulate the impetus of all links, promote the sound development of the cultural and creative industry, and stimulate the new element resources of the cultural and creative industry. By analyzing the transaction data under the benefit incentive mechanism, the market value of IP copyright can be truly evaluated, and the IP market can return to fairness and rationality. Han Shunfa, a Chinese scholar, points out that the market price of cultural assets is influenced by the attributes of investment and speculation. The investment attribute focuses on the actual use value of cultural property, while the speculative attribute refers to the tendency to pursue price fluctuations in order to obtain additional returns. However, China's copyright market competition is still in the initial stage, copyright protection and trading mechanisms have not yet been perfected, and capital competition is fierce, resulting in the formation of IP copyright prices in the market is often unreasonable. This makes the existence of a certain degree of capital speculation manipulation, which is not conducive to the cultural property market to give full play to its function and value [4]. Taking intellectual property as an example, Chen Yongwei, a scholar at Peking University, believes that blockchain technology helps to evaluate the market value of intellectual property by tracking the citations and citations of all intellectual property, and using algorithmic mechanisms to calculate its quality. The ownership, written records and circulation records of works on the blockchain are all traceable. The creator broadcasts the works to other nodes in the blockchain system, the sharer recognizes the value of the works through donation, purchase and other forms, and dynamically manages the trust points of the works through certain algorithms. In this way, audience evaluation data on IP value can be formed. This is an important index of IP market value evaluation model.

### **4.3 Cultural and Creative POW Mechanism and Blockchain Empower Cultural and Creative IP**

First, the cultural and creative POW mechanism is a way for participants to submit creative works, which are evaluated and recognized by the community. This mechanism can encourage a wide range of creators to participate and promote the prosperity of cultural creativity. Blockchain technology can provide decentralized, traceable and immutable characteristics to ensure the fairness and transparency of the selection process. By recording creative works on the blockchain, it prevents plagiarism and piracy and gives creators more protection.

Second, blockchain technology can provide solutions for copyright protection and management of cultural and creative IP. The value of cultural IP often lies in its uniqueness and scarcity, and blockchain technology can ensure that the copyright ownership and use rights of cultural IP are clear through smart contracts and encryption algorithms. In this way, cultural and creative IP can be better traded and circulated in the market, and creators can also obtain more fair and reasonable benefits from it.

In addition, blockchain technology can also provide innovative means for the marketing and promotion of cultural and creative IP. By establishing a decentralized digital marketplace and social media platform, Wenchuang IP can directly interact with fans and users to build closer relationships. The transparency and traceability of blockchain technology can also provide more references for market data analysis and user behavior research of cultural and creative IP, and help creators

optimize marketing strategies and product design.

## 5. Conclusion

With the rapid development of digital technology, blockchain technology has gradually become an important force to promote industrial innovation. It is certainly a beneficial attempt to promote the application of blockchain technology in the cultural and creative IP industry. Through blockchain empowerment, it can further stimulate the vitality of cultural and creative IP living inheritance, further integrate the rich philosophical thoughts, humanistic spirit, and moral concepts in local culture into the modern life of the masses with more real and rich characteristics, and inject new momentum into the development of regional cultural and tourism industry and cultural revitalization.

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## References

- [1] Zhang J. *Research on the practice path and communication mechanism of rural culture revitalization under the threshold of cultural and creative vision*. *Shenhua (II)*, 2022, (10): 62-64.
- [2] Sun Sumeng, Chen Xinrong, Xu Nuo, et al. *Current situation and development strategy of tourism cultural and creative products in the era of Intellectual Property Rights (IP): A case study of the "Qin Emperor seeking the Immortal" project*. *Office Automation*, 2019, 26(07): 26-28.
- [3] Hu Zimeng, Lei Xueyan, Li Mengxi. *Research on the design of characteristic tourism cultural and creative products based on regional culture*. *Art Appreciation*, 2020, (03): 39-40.
- [4] Chen Weichao. *Research on IP craze in Internet Literature from the perspective of Emotional Consumption*. *China Editor*, 2019, (01): 15-20.