

# Research on the Promotion and Development of Yungang Cultural Industry by Business Model Innovation under the Background of Digital Technology

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## Abstract

The cultural industry has both economic and cultural attributes, and its most remarkable feature is cross-border nature, emphasizing value appreciation and creative innovation. The cultural industry with Yungang cultural heritage as the core has begun to take shape, with unique Chinese and world significance, and high historical and cultural value. This paper actively explores the culture industry integrated with digital technology, the transform of business model, promotes and develops Yungang culture while enhancing the overall value of, and exploring a pathway that is in line with the sustainable development of Yungang culture industry. For outstanding contributions to the scientific protection and cultural inheritance of heritage, and the creative promotion and development of cultural industries.

## Keywords

Yungang Cultural Industry, Digital Technology, Business Model Innovation

## 1. Introduction

The Yungang cultural industry is based on the world historical and cultural heritage Yungang Grottoes. Yungang Grottoes has a history of 1500 years, which is located at the southern foot of Wuzhou Mountain and the northern bank of Wuzhou River, about 16 kilometers west of Datong City, Shanxi Province, China. It is the first time that a nation has carved a royal style of Buddhist art in a whole dynasty after Buddhist art spread to China. It is a historical monument of

the integration of Chinese and Western cultures in the 5th century, not only displays the exquisite craftsmanship of Chinese Buddhist art and ancient carving art, but also promotes China's extensive and profound traditional culture, which has extremely high cultural value and world significance. It was announced by the State Council as the first batch of national key cultural relics protection units in 1961, approved by UNESCO (United Nations Educational, Scientific and Cultural Organization) to be included in the "World Cultural Heritage" list in 2001, and became the first batch of 5A-level tourist attractions of China in 2007<sup>1</sup>.

Digital technologies represented by 5G, IPv6, VR/AR, AI, BD, etc. are booming. The traditional cultural industry business model has been unable to meet the needs of economic and social development, nor can it achieve the promotion of cultural industry and the inheritance of cultural heritage. Compared with the traditional cultural industry business model, the business model driven by digital technology has obvious advantages. First, it is conducive to the realization of resource sharing, the second is conducive to improving the operational efficiency of enterprises, and the third is conducive to improving customer experience and enriching consumer choices. Digital technology improves and perfects the innovation path of the business model of cultural industry.

At present, it is in the integration period of emerging digital technology and cultural industry. The empowerment of cultural industry by digital technology can effectively realize cultural inheritance and development. The Yungang cultural industry, due to its unique historical value, cultural value, and commercial value, should take the initiative to grasp the development trend of the times. This paper studies the business model innovation of Yungang cultural industry based on digital technology, the rest of the paper is organized as follows:

The Chapter 2 mainly elaborates the connotation and extension of the Yungang cultural industry. The Chapter 3 introduces the trend of digital technology and its integration with the cultural industry, how digital technology reconstructs the business model of the cultural industry. The Chapter 4 explores the innovation and practice of business model under digital technology. Finally, based on the development status of Yungang cultural industry, Chapter 5 proposes innovative methods for the business model of Yungang cultural industry based on the perspective of business models in five aspects: including digital concepts, cultivating cultural brands, mining the uniqueness of Yungang culture, realizing technological innovation by digital technology, constructing Yungang cultural ecology. The Chapter 6 states the innovations and limitations of the paper.

## 2. Yungang Cultural Industry

Yungang Grottoes heritage is the core of the innovation and development of Yungang cultural industry. Began in the early years of the Northern Wei Dynasty (AD 460), most of the construction of Yungang Grottoes were completed be-

<sup>1</sup>Cited from the official website of Yungang Grottoes (<https://www.yungang.org/>)—"Introduction to the Grottoes".

fore the time when the capital was moved to Luoyang (AD 494). And the sculpture project lasted until the Zhengguang period (AD 520-525). The grottoes were excavated on the basis of the mountains, stretching about 1000 meters from east to west. According to the shape of the grottoes, the content and style of the sculpture, the Yungang Grottoes can be roughly divided into three stages: early, middle and late. The artistic style of the statues in different periods is very distinctive. The early grottoes known as “Tan Yao Five Grottoes” are magnificent. The Buddha statues inside, with deep eyes and high noses, strong and straight bodies, and a solemn appearance, fully show the fierce and powerful spirit of the Tuoba Xianbei nation, which is an ancient clan of the Northern Wei Dynasty; The mid-stage grottoes are famous around the world for their meticulous carvings and gorgeous decoration that show the artistic style of the Northern Wei Dynasty, which is complex, changeable and magnificent; the late folk caves are more casual, and they are small in scale. The statues are delicate and beautiful, giving people an otherworldly sense. This style has had great impact on Longmen Grottoes. Owing to its unique characteristics, Yungang Grottoes, Dunhuang Mogao Grottoes and Luoyang Longmen Grottoes are known as the “Three Great Grottoes in China” (Xie, 2015). As a royal project of the Northern Wei Dynasty, the Yungang Grottoes are large in scale, exquisite in carving, rich in content, and vivid in appearance. They are the peak of the Chinese Buddhist art and represent the highest level of carving of the world in the fifth century.

The Yungang Grottoes’ tourism started at a very early age. But over the past years, the whole process of its development was proceeding slowly. It was difficult for the local government to improve the cultural quality and realize the cultural industrialization because of the restriction of the system, the ideas and other aspects. Since 2008, some achievements have been made in raising the cultural taste, exploring the historical connotation of the Yungang culture and developing the tourism industry. The Yungang Scenic Spot has begun to take shape, and many cultural landscapes have been formed, including the Tan Yao Square, Divine Rock Temple, etc. The combination of all these landscapes reproduces the charming scenery recorded by a famous geographer of the Northern Wei Dynasty named Li Daoyuan in “Shui Jing Zhu” - “Halls and temples are surrounded by mountains and waters. The mist blurred the edges of the temples built against with each other. Valleys full of plants are reflected in the water. As long as you blink, the scene will be completely different”. The cultural industry enjoys a sound momentum of development. Taking Yungang Museum, Performing Arts Center, Divine Rock Temple and Liaojin Food Street as representatives to explore the connotation of the Yungang culture, more than 20 cultural enterprises have been introduced into the spot. Besides, franchise stores with local cultural characteristics are set up to integrate local products and folk handicrafts, including Yungang Calligraphy and Painting Academy, Yungang Stone Carving Store, Daijing Wood Carving Store, Yungang Silk Doll Store, Guangling Paper-cutting Store, Lingqiu Silver Store and other special stores. By now, the Yungang cultural products have covered more than 500 types, formed the ag-

gregation of cultural industries in Yungang, which have greatly enriched the cultural industry market.

In recent years, the work focus of Yungang Grottoes Research Institute has gradually shifted from environmental governance and cultural facilities construction to the balanced development of cultural industries<sup>2</sup>. This is the breakthrough point of this article. How to strengthen and expand Yungang cultural industry through the implementation of scientific and technological innovation strategies become a problem that needs to be solved urgently. At present, the “Digital Yungang” construction project has been implemented and a new Yungang Digital Center has been invested, which has laid a foundation for promoting the digitalization of Yungang Grottoes. At the same time, under the background of digital technology, whether it can bring new development to Yungang cultural industry and how to form a creative business model become the focus of this paper.

### **3. New Trends in the Digital Technology and Cultural Industry**

#### **3.1. Digital Technology**

Digital technology is one of the most important technological innovations in the history of mankind, it is also a new driving force for the development of contemporary society. Although digital technology is the result of the cross-fusion of mathematical theory, electronic technology and computer technology with formal logic reasoning and method application as the main content, it has produced unprecedented fission effects after been integrated into economic and social development (Han, 2018). With the deep integration of new technologies such as digital technology with economic and social fields, the reform and development process of major industries is also constantly advancing. For the cultural industry, the impact of digital technology not only lies in reconstructing the organizational structure, accelerating the integration with other industries, forming new products, new models and new formats, but also promotes the global development of industrial spatial layout, breaking the original relationship between supply and demand, making cultural products and services more intelligent and customized. At present, the overall layout of Yungang cultural industry has basically taken shape, gradually realizing large-scale operation, social and economic benefits are increasingly apparent.

#### **3.2. Digital Technology Reconstructs the Business Model of Cultural Industry**

Digital technology represented by 5G, IPv6, VR/AR, AI, BD, etc. have expanded and deepened the innovation of cultural industry business models, changed the form of traditional cultural industries, and inspired new formats of digital cul-

<sup>2</sup>Quoted from the website of China Economic Net titled on “The Great Development of Yungang Grottoes Cultural Industry”

[http://www.ce.cn/culture/gd/201411/19/t20141119\\_3936270.shtml](http://www.ce.cn/culture/gd/201411/19/t20141119_3936270.shtml).

tural industry. The integration of culture and technology has become an important trend in the development of cultural industry. The technological revolution has changed the production and the consumption mode of cultural products. In this process, the internal structure and operation mode of cultural enterprises have also changed, driving the transformation of the business model of traditional cultural industry. At the same time, “Culture + Technology” has spawned many new formats of cultural industries, such as digital publishing, digital animation, online games, we media and so on. The emergence of new formats also greatly promotes the innovation of business model (Li & Hao, 2020). This paper intends to reform and reconstruct Yungang cultural industry with digital technology, fully consider the characteristics of the Internet, its own value orientation, production process, its own industrial chain and other factors to innovate business model.

Digital technology is both a technology and a platform. As far as its technology is concerned, it has changed the production, circulation, and consumption of cultural products by means of informatization and digitalization. About the platform, the Internet is a large one with borderless features that can achieve cross-border integration of different industries, greatly extend the cultural industry chain, change the internal structure of the cultural industry, and prompt it to change its business model. Therefore, this paper focuses on the advantages of the Internet platform, emphasizes the use of the platform to create a platform for external promotion of Yungang culture, and links the advantages of the Internet with the characteristics of the business model of the cultural industry, so as to create a business model of Yungang cultural industry and give better play to the value of the cultural industry.

## **4. Business Model Innovation in the Context of Digital Technology**

### **4.1. Business Model Research**

The business model serves to realize corporate value, and any industrial organization in building its own business model is also closely focused on realizing corporate value. The business model system consists of value propositions, target customers, customer relationships, distribution channels, core capabilities, cost structure, value structure, partner networks and revenue models (Osterwalder, Pigneur, & Tucci, 2005). Business model evaluation consists of four dimensions: efficiency, uniqueness, matching and profitability (Hamel, 2000). A novel and efficient business model can better realize the value creation of an enterprise, which has become the main factor in the design of the business model (Amit & Zott, 2001).

The cultural industry business model centers on user cultural experience and emphasizes the spiritual experience of target users. The business model mainly focuses on its own functional positioning, the choice of target customers, and the acquisition of resource use rights (Xi, 2018). The foundation of the success of

the cultural industry business model is to meet the needs of customers, the core element is the quality of cultural products. The current business model of the cultural industry is mainly based on brand first, content as “king”, and industrial chain management (Fang, 2012). The cultural industry business model takes creative innovation as the main value proposition, which is more reflected in the unique combination of products or services and brings unique value or more benefits to customers (Chen & Lv, 2010). The first element of cultural industry development is creative innovation. In the development model of cultural industry, new business formats such as “Culture+” and “Creativity+” continue to emerge (Wei & Kong, 2016). Digital technology is used to drive the innovation of business model of cultural industry. In terms of cultural content production, three business models are proposed: linkage model, interactive model, and integration model. Cultural industry is characterized by “boundlessness”, diversity, combination of online and offline. The future model, platform model and advertising marketing model are proposed (Huang & Chen, 2016). The mode innovation in the context of Internet should start from the innovation of cultural products, communication channels, business plates and operation mechanism (Wang & Liu, 2015).

#### 4.2. Business Model Practice

The domestic and foreign cultural industries are changing their business models driven by digital technology, and many cultural industries with emerging business models have been born, such as Amazon online bookstores, Tik Tok, Toutiao, Kuaishou, etc., they have grasped the opportunities brought by the technological revolution and changed the profit model of traditional culture industry. These are beneficial explorations of the transformation of business model of cultural industry under the background of digital technology.

Digital technology has innovated the industrial form in the cultural industry of news information services, content creation and production, digital content and copyright services, content preservation services, etc., changed the structure of the industrial chain and the development model, optimized and upgraded the business model of the cultural industry, and formed a unique digital cultural industry. At present, many cultural enterprises at home and abroad have integrated new technologies such as the Internet into their company’s production and operation activities, thus creating many unique business models. Up to now, digital cultural industry has become the leading form of cultural consumption, the source of current cultural innovation, and the mainstream form of mass cultural consumption. On the one hand, digital technology promotes the transformation and upgrading of traditional cultural industry to new media, financial media, digital publishing, digital advertising, digital entertainment and other digital cultural industries, and promotes the traditional cultural industry to get rid of the shackles of the original development mode and industrial chain mode; On the other hand, it has also promoted the rise, development and growth of

emerging digital cultural industries represented by online literature, animation movies, e-sports games, online videos, and smart cultural tourism (Tan & Hao, 2015).

Excellent traditional cultural resources must not only be rescued, protected, and inherited, but also their potential social and economic values must be fully explored, transformed through production creation, product creativity, and technological innovation, and shape the traditional cultural market from the perspective of economics and management. Innovative diffusion and industrialization development model to realize the unification of economic and social benefits of the digital cultural industry. Based on the industrialization experience of cultural heritage institutions, four digital industry models for digital collections are proposed: online access and display of images, proprietary image-licensing, open image-licensing and user-generated art images (Enrico & Federico, 2013). The online marketing business model promotes the protection of cultural resources and technological innovation in the Val di Noto region of Italy (Trovato & Sturiale, 2014). The Uffizi Gallery in Italy has built a mobile digital platform for digital collections, multimedia tourism and Web2.0 facilities, and balances curatorial methods and economic benefits through virtual value chain model innovation (Capone & Lazzarotti, 2016).

## **5. The Promotion and Development Path of Yungang Cultural Industry Based on the Business Model Perspective**

### **5.1. Innovative Use of Digital Concept to Consolidate the Foundation of Yungang Cultural Industry Development**

Yungang Museum should be committed to combining cultural resources to develop and discover cultural and creative products around Yungang, and gradually form a more mature cultural and creative industry through effective media promotion, digital platform construction, brand management, and market-oriented business models. The museum can cooperate with Gaode Maps and Tencent Maps to develop mini digital tour app for scenic spots, and use leading technologies such as precise positioning, hand-drawn maps, and POI geographic fence to bring visitors a different tour experience. The mini app can also provide different browsing routes when visitors visit through precise positioning, and design punch in and unlock activities in the routes to increase the interest and experience of tourists. With the rapid development of the Internet, digital dictionary resources are a new way to expand audience dissemination. Yungang Museum can develop an online APP to show the history, economy, society and humanities of the Northern Wei Dynasty in detail, and realize the transformation of digital museums. At the same time, it can also develop mobile games or co-branded digital products, pay attention to the interaction with the audience and the interests of young people, and be able to combine the characteristics and hot spots of the contemporary, that year or that time. Yungang Museum should

also design high-quality, easily recognizable, interesting and interactive cultural products to stimulate visitors' consumption of cultural products.

### **5.2. Strengthen the Cultivation of Cultural Brand and Expand the Development Space of Yungang Cultural Industry**

Design "Yungang" cultural and creative brand. Yungang Museum should use Yungang culture as the carrier, set foot in the fields of network, film, TV and we media, fully learn from the cultural and creative brand promotion concept of the Palace Museum in China, realize the popularity and flow of cultural brands, and get the recognition of the public. For example, "Renewing the Forbidden City" creatively invites celebrities and guests as cultural and creative new product developers, combining design students from colleges and well-known designers to jointly develop cultural and creative derivatives that combine the theme of the program, and open up the two-way interaction between the audience and the Forbidden City culture. The new link expands the target consumer group of cultural and creative products. The documentary "I Repair Cultural Relics in the Forbidden City" focuses on the most mysterious "historical doctor" in the Forbidden City, combining serious craftsmanship with humanistic feelings.

Promote "Yungang" cultural and creative brand. Yungang museum should further develop websites, Weibo, Taobao and WeChat official account, continue to attract and maintain fans. It also organizes international exhibitions and cultural and creative museums to achieve the world heritage tour and promotion, enhance the creativity and competitiveness of products, and make Yungang culture go out of Datong city and go global. Yungang museum should further expand its market-oriented operation, actively cooperate with e-commerce, and open multi-mode online and offline sales channels. The museum can adopt self-operated, cooperative operation, brand authorization and other methods for sales. It should operate official flagship stores on large e-commerce platforms such as JD.com and Taobao to create its own IP.

### **5.3. Explore the Uniqueness of Yungang Cultural Heritage**

Taking scientific protection of the world heritage, scientific promotion and inheritance of the world cultural heritage as the starting point, explore the uniqueness of Yungang cultural heritage, build cultural value soft power and matching business model, and provide inexhaustible impetus for the development of cultural industry. At present, the Palace Museum, Dunhuang Research Institute and Longmen Grottoes Research Institute have formed a representative cultural industry ecology, highlighting cultural connotation and reflecting strong commercial value. Yungang cultural industry is also unique. Compared with many Grottoes in China, it has the most western style. The so-called Hu style and Hu rhyme are the strongest charm. There are not only Indian, Central and Western Asian art elements, but also Greek and Roman architectural styles, decorative patterns and image features, reflecting the relationship with the world's major civilizations, which is extremely rare in the treasure house of Chinese art.



So, whether the potential of Yungang cultural industry can be fully tapped to form a representative business model is extremely important for the inheritance and promotion of culture.

#### **5.4. Implement the Strategy of Technological Innovation and Empower with Digital Technology**

In recent years, Yungang studies have made great progress as an independent discipline. It has established extensive academic exchanges and cooperation with Peking University, Tsinghua University, Central Academy of Fine Arts, Chinese Academy of Cultural Heritage, Dunhuang Academy, Longmen Grottoes Research Institute, Hebei Normal University, Lanzhou University, Shanxi University and other research institutes as well as domestic famous universities. Taking the opportunity of holding Yungang International Academic Seminar, establishing a professional scientific research team, strengthening international academic exchanges, enhancing the academic status of Yungang Studies, and implementing a strategy of technological innovation.

How to integrate the research and innovation of business model with digital technology. Currently, digital technology has established a new path for cultural communication and cultural inheritance. New technology and its digitization bring new formats, new elements and new markets to the cultural industry, and the high-quality development of cultural industry is not only the promotion of industrial profits, but also the priority of cultural social value and the unity of social value and economic value.

Since 2008, digital technology has made great breakthroughs in Yungang cultural industry. In the cave archaeological investigation, three-dimensional digital scanning technology was used for the first time and achieved success. The three-dimensional modeling and intelligent database construction of Cave 12 have been completed, and the results have reached the leading level in China. After the “digital Yungang” construction project launched, Yungang Digital Center was invested to further promote the digitalization process of Yungang Grottoes with Zhejiang University, Beijing University of Civil Engineering and Architecture, Datong Surveying and Mapping Institute, etc., laying a solid foundation for realizing the digitalization of cave statue protection and intelligent scenic area management of Yungang Grottoes. While the cultural heritage is scientifically protected, the cultural industry has been effectively promoted and the inheritance of cultural heritage has also been realized.

#### **5.5. Establish Yungang Cultural Industry Ecosphere**

In recent years, digital technology has innovated the industrial form in cultural industries such as information services, content creation and production, and changed the structure and development model of the industrial chain. The government should actively support the development of cultural tourism industry, encourage enterprises to develop Yungang characteristic products, and increase experiential and immersive service projects. Strengthen network marketing and

publicity, redesign and upgrade the official website of Yungang Grottoes, actively develop cultural products and cultural creative product modules, strive to be rich in content, complete service functions, and timely information updates. At the same time, it actively leverages the advantages of e-commerce and cooperates with large e-commerce giants such as Taobao, Meituan, and Ctrip to realize online sales of scenic spot tickets, Yungang cultural products, local air tickets, online hotel reservations, and many other service functions. To set up official Weibo, Twitter, Tik Tok of Yungang Grottoes, timely release various information, provide high-quality service platform for tourists to visit and study Yungang Grottoes, and effectively enhance the world popularity and reputation of Yungang Grottoes.

## 6. Innovation and Outlook

Based on Yungang cultural industry, this article exerts the value of cultural heritage from the perspective of business model. Accounting to the authors, there is no related research literature in China till now, which is a research gap. This is a new field for the study of Yungang studies and has a certain degree of groundbreaking. Besides, it is not limited to the commercial value of the Yungang cultural industry, but from the business model to study the promotion and innovative development of the cultural industry, through digital means to achieve a wider and more far-reaching communication and influence, and give full play to the economic and social value of Yungang cultural industry, and strives for the integration of industry and technology.

This article is significantly different from the traditional “Internet+” research on the development of the cultural industry. Traditional literature focuses on the development of the industry under the background of “Internet+” and promotes it with online and offline integration strategies to give full play to the economic value of the industry. This article is not limited to the promotion and application of Internet platforms, but extensively considers digital technology under the “new infrastructure” policy, and expands and deepens the business model of cultural industry represented by 5G, IPv6, VR/AR, AI, BD, etc. Innovatively grasp the trend of cultural and technological integration, build a new business model to promote and develop Yungang cultural industry.

At this stage, the literature research method and the qualitative research method are adopted. The follow-up research not only conducts qualitative research on the promotion and development of Yungang cultural industry through surveys, interviews, and issuance of questionnaires, but also conducts qualitative research on the application of digital technology and the development of Yungang cultural industry, and quantitative empirical research on the dynamic relationship between the two makes the research conclusions more reliable. In addition, the representative ecological cases of cultural industry will be selected for case study, such as the Palace Museum, Dunhuang Research Institute and Longmen Grottoes Research Institute. The advantages and core competitiveness

of cultural industry promotion are investigated on the spot, and the innovation and improvement of its business model and the application of digital technology are used for reference. Through comparative research with representative cultural industry ecological cases, will continue to explore the uniqueness of Yungang culture and the breakthrough points of innovative business models, learn from the successful experience of other cultural industries, and closely integrate the regional advantages and own characteristics of Yungang cultural industries to find the most suitable business model and strategy for its own development.

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## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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