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On the Digital Transformation and Upgrading of Cultural Industry under the Integration of Culture, Science and Technology

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Abstract: *Culture and technology are indispensable in the digital transformation and upgrading of cultural industry. Whether they can integrate and promote each other is the key to the success of the digital transformation and upgrading of cultural industry. At present, while culture and science and technology play a role in the process of digital transformation of cultural industry, it has exposed the problem of over reliance on technology but failing to give full play to its technical advantages. In order to make better use of technological progress to promote the digital transformation and upgrading of cultural industry, this paper puts forward the development way of integrating technology and culture such as 5G, AI, blockchain and big data.*

Keywords: *Digitization of cultural industry; Culture and technology; Artificial intelligence; Blockchain technology; Big data technology*

The Necessity of The Integration of Culture, Science and Technology

Since human society entered the information age with the progress of digital technology, various traditional industries have undergone disruptive changes under the impact of technology. Science and technology has had an unprecedented impact on human production and life. For example, the birth and application of Internet technology ranging from changing payment methods, consumption habits and travel choices to reorganizing benefit distribution, resource control and industrial ecology, It has affected the economic, political and cultural development of human society from micro to macro. The digital transformation and upgrading of cultural industry is also based on the integration of culture and science and technology under the influence of technological development.

First of all, the digitization of cultural industry is produced with the emergence and development of digital technology. It is the industrial dimension upgrading brought by scientific and technological progress. McGuire (2006) believes that technology has a very significant impact on the cultural industry. The film industry is developing in the renewal of acousto-optic technology. The publishing industry was born with the emergence of printing technology and changed under the impact of digital communication technology. The progress of AI technology makes it possible for robots to enter the field of cultural content creation and production, The portability of photographic equipment and the popularization and application of Internet technology make the public become producers from passive recipients of cultural content. The progress of virtual reality

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technology and the reduction of equipment cost make immersive experience popularized in the cultural and tourism industry. Technology is the basis for the digital realization of cultural industry. Constantly exploring the innovative application of technology in cultural industry is an indispensable means to promote the digital transformation of cultural industry.

Secondly, the successful digital transformation of the cultural industry must take the route of high-quality content output. The exploration of traditional cultural resources and the re creation of its spiritual core are not only an effective means to ensure the quality of cultural content, but also a correct way to tell Chinese stories and improve the international influence of Chinese culture. Chinese traditional culture is a rich mine, but the basic resources such as historical works and skill inheritance face the risk of loss with the erosion of time. The changes in values brought about by social progress also put forward screening and innovation requirements for traditional culture. The ability and enthusiasm of the public to participate in the expression and output of traditional culture need to be improved, All this makes how to tap the rich mine of Chinese traditional culture a problem that must be faced for the success of digital transformation and upgrading of China's cultural industry. The cultural industry must take content as the core to ensure high-quality development.

Therefore, culture and science and technology play an important role in the digital transformation of cultural industry. However, if they develop independently in their respective fields, they will not only cause a waste of resources, but also can not really transform technology into productivity and promote the progress of the industry. Only by integrating with each other and exerting their respective advantages can we push the digital transformation and upgrading of China's cultural industry to success. The setbacks faced by the Publishing industry in the US and Europe during the COVID-19 pandemic in 2020 are a strong proof of this. The setbacks faced by the Publishing industry in the US and Europe during the COVID-19 pandemic in 2020 are a strong proof of this (Ren, 2021). After the closure of the city in March 2020 in Britain, the traditional bookstores and entity publishers were in a predicament, compared to the explosive growth of digital publishing content, such as Amazon and other online bookselling platforms and e-books. In this context, many traditional bookstores are temporarily launched in an attempt to save themselves with the sales model of e-commerce. Although the corresponding Internet technology has long been mature, the inexperienced physical bookstores almost fail regardless of scale. The online sales operation mode and logistics system mode make it difficult for traditional bookstores to complete smooth online operation, In addition to relying on "selling miserably", there is almost no effective publicity. All this proves that online book selling is not a simple work that can be completed by physical book retailers + Internet technology. The deep integration of technology into the industry can bring a qualitative leap.

Problems Exposed by the Integration of Culture, Science and Technology

After several years of development, the digital transformation of China's cultural industry has made considerable achievements. It has developed online cultural projects such as cloud performance and cloud variety. Digital culture such as online games, online music and online education also shows a good growth trend, but there are also some problems in the development process.

Firstly, the digital transformation relies too much on the innovation of technical means, and Internet companies have become the main force in the development of digital culture industry. The traditional Internet monopoly communication mode with traffic as the core makes the digital culture industry pay more attention to form than content. As an effective means to attract consumers' curiosity, the technology application accelerated by renewal iteration has become the focus of digital innovation in the cultural industry. Although it has reaped the massive growth of cultural content and the rapid increase of cultural information receiving users, it has also caused the problems of uneven production quality of cultural content, low content value and high repetition rate. Taking the most obvious short video platform as an example, the public participation in content production has enabled the short video platform to successfully harvest a large number of content and users. The emergence of different forms of content templates and music templates has mobilized the public's enthusiasm for creation and become a sharp tool to capture traffic, For example, Yang Mi's AI face changing video, which easily obtained 110 million traffic, has driven the creation upsurge of such videos, and many well-known Chinese actresses have become the protagonists of face changing video. If Facebook chairman Parker's face changing video is ironic to technology companies, most of these entertainment face changing videos lack sufficient cultural value and bring technology Carnival to ordinary people, It is also causing the problem of violating ethics and guiding the wrong aesthetic trend.

Secondly, in the process of digitization of China's cultural industry, the requirements of hierarchical construction are not implemented in place, especially in the field of culture and tourism. Blind follow-up, repeated construction and derailment of project volume from the actual situation occur from time to time. Taking virtual reality technology as an example, the immersive experience of virtual reality technology has the advantage of crossing the limitation of time and space. Coupled with the drainage effect caused by curiosity caused by science and technology, it is very suitable to become a technical means for the innovative development of relic tourism destinations. However, the implementation of virtual reality technology needs not only the investment of equipment, but also the support of database. Its final experience effect depends on the implementation quality of both, and has high requirements for human, material and technical ability. Through long-term efforts and cooperation of high-quality talents, the Imperial Palace in Beijing and Dunhuang in Gansu have realized immersive online experience with virtual reality technology, effectively publicized Chinese traditional culture, and made a successful demonstration for the application of virtual reality technology in tourism. However, many tourist destinations ignore the actual conditions and needs Under the condition that material resources and cultural resource values are not available, the project to build a large database and immersive experience venues has little hope of success even if a large amount of resources are continuously invested.

Finally, big data, as an important governance basis for the digital transformation of the cultural industry, has not played its due role. There are still many data islands in the big data platform, affecting the generation of big data synergy. In the cultural and tourism industry where big data can directly provide users with convenience, there is a lack of information sharing among tourism information websites such as Ctrip, Feizhu, Funiu and wasp nest, which not only leads to more homogeneous information, but also makes users have to turn around major platforms to achieve complete information collection. Although map platforms such as Gaode with free navigation users have the advantage of information integration, However, it can not obtain enough authorization. When the tourism information is scattered in different government departments and tourism enterprises, the data information under the Internet is still an isolated island, and it is difficult for

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users to obtain tourism information one-stop. This phenomenon not only occurs in the culture and tourism industry, but also in cultural industries such as digital cultural content production, which are faced with plagiarism and piracy caused by lack of information sharing. News robots that rely on big data for creation have the problem of homogenization of reports. On the one hand, these problems expose the defects in the amount of cultural big data data sharing, and require accelerating the construction of cultural big data platform, standardizing data acquisition and improving the amount of data collection, so as to realize the effective integration of big data technology into the cultural industry. On the other hand, they also propose to regulate the use of big data by system and break the central intensive industrial ecology, Build a differentiated and active digital cultural content sharing platform with blockchain and mass co creation as the core.

Development Trend of Integration of Culture, Science and Technology

In view of the problems faced by the integration of culture, science and technology in the digital transformation of cultural industry, following the principle of science and technology as an auxiliary tool and cultural content as the core of the industry, and aiming at promoting the digital transformation and upgrading of cultural industry through technological progress, we can explore the effective integration of culture and science and technology in the following ways.

Promote the Digital Transformation and Upgrading of Cultural Industry to Intelligent Development

The digital transformation of cultural industry should take advantage of the opportunities brought by the development of 5g and AI technology, promote the digital transformation and upgrading of cultural industry to the road of intelligent development with technological progress (Xie, 2021), and lay a good foundation for China's cultural industry to take the lead on the international stage and lay a good foundation for both software and hardware infrastructure of technology.

In 2019, the Ministry of industry and information technology issued a commercial license to officially put 5g technology with high rate and low power consumption into commercial application. 5g, as an iterative update technology of information transmission, provides an upgrade basis for virtual reality, augmented reality, cloud computing, Internet of things and other technologies whose content quality depends on data transmission speed, It creates a channel to improve the quality and experience of cloud cultural formats produced through these technologies. Especially for the film and television industry and digital publishing industry that are highly dependent on technological development, the improvement of 5g technology transmission rate can not only use the accurate and efficient dissemination of data to promote the improvement of content clarity and interactive synchronization (Zhu & Yao, 2021), but also boost the industrial innovation of virtual reality and augmented reality technology that can not be actually applied to commercial projects because of the large amount of data transmission, Give birth to new business forms. China's leading edge in 5G communication technology represented by Huawei should be effectively transformed into productivity through the construction of software and hardware infrastructure such as satellite and ground equipment, the cultivation of communication talents and the development of high-speed data transmission applications, so as to promote

the digital transformation and upgrading of cultural industry.

AI, i.e. artificial intelligence technology, has been applied in the cultural industry since its birth in 1956, which has experienced a preliminary stage limited to entertainment and information retrieval. The neural network training based on Reynolds "cultural algorithm" and in-depth learning began to get involved in the growth stage of the field of content production (Xie & Gao, 2021) and is currently infiltrating into the production of cultural content and the dissemination of cultural information through the subdivision of cultural industry, and has made breakthrough progress in quantity, speed, involved fields and humanized effects. Since entering the high-speed development stage in 2018, AI technology has been widely used in the media industry and art industry. For example, the news editing robot based on AI technology has won its place in the domestic and foreign mainstream news media with fierce competition among media people such as Reuters, Los Angeles Times and Xinhua news agency because of its accurate, real-time, fast and authenticity, It is not uncommon for AI paintings, music, poetry and other art works to be true or false, and to be sold at high prices. Compared with human beings, the obvious advantages of artificial intelligence in data processing quantity and processing speed, and the rapid improvement of constantly updated algorithm technology in perceptual creation ability all show that artificial intelligence technology can bring expansion and innovation power to the digital content production of cultural industry. To make effective use of artificial intelligence technology, on the one hand, we should adhere to the principle of technicism, continue algorithm technology innovation and use 5g technology to help the growth of artificial intelligence based on big data analysis. On the other hand, we should consider the principle of humanism and standardize the values of artificial intelligence transmitted through cultural content production with robot ethics, For example, the document "new generation of artificial intelligence governance principles – developing responsible artificial intelligence" issued by China in 2019 sets out the basic human moral and ethical principles that should be followed in the development of artificial intelligence.

As the latest technology that can be applied to the digital transformation of the cultural industry, 5g and AI can not only provide assistance in different segments of the cultural industry, but also produce a chemical reaction based on big data analysis, so as to realize the advanced intelligent production of digital content in the cultural industry and upgrade the digital transformation of China's cultural industry to the dimension of intelligent development.

Promote Cultural Content Sharing and Creation Ecology Based on Blockchain Technology

The characteristics of blockchain technology sharing, transparency and collectivization provide technical support with broad trust foundation for the construction of shared digital content production platform, making it possible for the healthy and ecological development of public sharing, co construction and co governance of the content industry. The public shared creative ecology ensures the benefit acquisition of the mass creative group with the "long tail effect" (Xu, 2021), so that cultural innovation has a broad channel derived from the group wisdom.

Driven by the popularization of mobile Internet technology and the development of portable photography

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equipment, the production of digital cultural content is changing from the original PGC production mode to UGC production mode (Zang & Hu, 2021). Although the main body of content production has undergone essential changes, due to the centralized production mode of monopoly to obtain the maximum benefits adopted by the Internet industry under the guidance of capital, the rights and interests of mass content producers are in the hands of the platform. The principle of cultural content production with the pursuit of interests as the priority not only violates the particularity of social responsibility of the cultural industry, It also leads to the increase of content homogeneity and inferior quality. According to He Qi (2019) and others, through the analysis and Research on the network structure of the creative subject of Chinese film data from 2012 to 2019, it is concluded that the Internet video platform, as the core node of the creative network of the film industry, has strong control over the whole film industry, and the film and television groups with internet background are in the interest distribution It has obvious competitive advantages in resource integration, dissemination and promotion. This conclusion is a strong proof that China's digital content production is monopolized by the Internet platform, breaks the traditional digital content production mode monopolized by the Internet platform, and establishes an equal public sharing industrial ecology, It is not only the inevitable requirement for the digital transformation and upgrading of cultural industry to embark on the road of high-quality and healthy development, but also the correct direction in line with the requirements of socialist political and cultural development.

The basic mechanism for blockchain technology to establish a chain like equal relationship for users is an effective means to break the centralized content production of traditional Internet platforms. It can completely break the monopoly of Internet platforms from the perspective of benefit distribution and provide equal rights and interests for small and medium-sized content enterprises and individual content producers. At the same time, its characteristics of joint construction and joint supervision can stimulate the creative power of the public and ensure the survival of the fittest in content production, make the flow oriented interest oriented cultural content production lose the pursuit power, and eliminate the deterioration trend of digital content production. However, to complete the construction of cultural content sharing and creative ecology, science and technology is only one of the auxiliary tools, which provides a tool carrier for the completion of ecological construction. In addition, it also needs the cooperation of government system regulation, improvement of financial investment system and even the transformation of creators' group thinking mechanism, Only by integrating blockchain technology with the construction process of creating digital cultural content sharing and creation ecology, constantly adjusting and forming a mature model of mutual promotion, can blockchain technology be effectively used as a tool.

Upgrade the Digital Transformation of Cultural Industry into a Holistic Thinking Governance Model

Big data technology provides a subversive means for cultural industry governance. Huge data from the public can be quickly collected, sorted and classified, and the links between data can be mined and analyzed regardless of the needs of application users, which provides conditions for reform of the governance model of the cultural industry, Making use of big data technology to build a digital cultural industry governance model that can not only make overall planning, but also conduct differentiated supervision in different areas is conducive to all factor governance, resource allocation optimization, development, quality and efficiency

improvement of the cultural industry.

The explosive growth of content output and dissemination speed of the cultural industry in the Internet era has also brought difficulties in supervision and governance. The central network information group established in 2014 has focused on the content supervision of the Internet cultural industry previously scattered in different government departments, while improving the confusion of functions caused by multiple departments of China's Internet management, It also puts forward higher requirements for the speed of data collection and analysis. Since then, the hierarchical three-dimensional management model (Zhu & Zhang, 2021) further built according to the Chinese traditional administrative system has made demands on the analysis ability of data segmentation and relevance. Only by further developing big data technology and continuously providing sufficient data volume and standardized data model for cultural big data Smooth data acquisition channels can provide reliable technical weapons for the overall governance of China's cultural industry.

Before the birth of big data technology, limited by research data, cultural governance can only implement the judgment of right and wrong, and the investigation of its background or relevant influencing factors lags behind, which is difficult to become the basis for governance, resulting in the lack of overall thinking mechanism, especially in the early stage of the birth of the Internet industry, The huge amount of information circulation makes the traditional laws and regulations and regulatory means ineffective, and the network has almost become an illegal place. With the maturity and improvement of corresponding laws and regulations and governance departments, the improvement of regulatory efficiency brought by big data technology and artificial intelligence technology has added the last piece of puzzle to the governance of digital culture industry, so that the governance of digital culture industry can realize the overall judgment of integrating multiple influencing factors on the basis of huge data.

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