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Deep Integration and Development of Computer Technology and Cultural and Creative Industries

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Abstract:
The development of computer technologies such as the Internet of Things, big data, cloud computing, and AI has brought unprecedented changes and opportunities for the cultural and creative industries. Computer technology, as an important engine driving industrial innovation, profoundly influences the cultural and creative industries in terms of production methods, communication models, business models, and consumer experience. This article analyzes the practical application of computer technology in the cultural and creative industries, and explores the path and development trend of their deep integration. Finally, strategic suggestions were proposed to promote the deep integration of the two, including strengthening industry university research cooperation, building an open and shared innovation ecosystem, improving relevant laws and regulations, and promoting international cooperation and exchange. In the future, with the continuous iteration and deepening of computer technology, the cultural and creative industries will achieve high-quality development in digital transformation and play a more important role in cultural inheritance, economic growth, and social innovation.

Keywords: computer technology, cultural and creative industries, AI empowerment, opportunity, challenge, response strategy

INTRODUCTION

With the rapid development of information technology, digital technology has penetrated into various fields in all aspects, and the cultural and creative industries are deeply influenced by it. Digital technology has not only changed the production methods and dissemination channels of cultural and creative products, but also reshaped the consumer experience mode, becoming a key force in promoting the vigorous development of the cultural and creative industry.

Research on the integration of digital technology and cultural and creative industries started earlier in foreign countries and has yielded fruitful results. American scholar Kevin Lynch proposed in "The Image of the City" that virtual spaces constructed by digital technology bring new opportunities for urban cultural and creative industries. For example, New York's digital art district attracts global tourists through digital displays, interactive experiences, and other means, making the cultural and creative industry a new landmark of the city and providing theoretical basis for studying how digital technology shapes cultural spaces.

In China, relevant research is also keeping up with the pace of the times. Scholars such as Chen Shaofeng explore the innovation of business models in the cultural and creative industries in the digital age in their book "Business Models of Cultural Industries". They analyze the development model of the entire industry chain of Tencent Animation IP, and use digital platforms to achieve diversified monetization of comic creation, animation production, and peripheral derivatives, providing examples and references for the transformation of local cultural and creative enterprises' business models. In addition, Dan Jixiang combines the practice of the Palace Museum to explain how digital technology empowers cultural heritage protection and creative development. For example, the "Digital Palace Museum" project brings cultural relics to life, triggering in-depth discussions on the digital inheritance and innovation of traditional cultural resources. A series of disciplines represented by artificial intelligence

Technological innovation is a type of agglomeration innovation and an important aspect of industrial technological innovation Factors.[1] Due to the universal applicability of data processing, speech and image recognition, machine learning/deep learning, intelligent algorithms, and other technologies in artificial intelligence in new media communication, big data technology can aggregate and utilize hidden and undiscovered information with potential value.[2] Many studies have laid a solid theoretical foundation for the integration and development of digital technology and cultural creative industries in China. Combining computer graphics and interactive

technology, virtual reality (VR) applications are profoundly changing the way cultural content is disseminated, expanding from two-dimensional planes to three-dimensional spaces, providing new sensory and interactive experiences. This technological integration not only breaks through the physical and temporal limitations of traditional communication models, but also significantly enhances the immersion, interactivity, and creative expression of cultural content.

THE MANIFESTATION OF COMPUTER TECHNOLOGY EMPOWERING CULTURAL AND CREATIVE INDUSTRIES

Digital technology covers a wide range of fields and integrates multiple digital technologies, including core areas such as blockchain, big data, cloud computing, and artificial intelligence. Li Lihui pointed out that digital technology can build efficient networks, break traditional connection models, establish digital trust through blockchain algorithms, drive social development, and be widely used in multiple sectors such as electronic computers, numerical control, communication, and instrumentation. Its development is based on the advancement of electronic devices, such as the invention of the electron tube in 1906 which laid the foundation for electronic computers; In 1947, the emergence of transistors propelled computers towards compactness and efficiency; The birth of integrated circuits in 1958 led to the emergence of microprocessors and ushered in a new era of electronic technology; In the mid-1970s, the popularization of personal computers changed the way people lived and worked; The development of the Internet makes the global computers connected and the information transmission more convenient; Since the mid-1980s, multimedia technology has enriched and diversified digital applications.

Digital technology plays a crucial role in the dissemination and promotion of cultural and creative industries, breaking the limitations of traditional communication models and greatly expanding the boundaries and effectiveness of cultural and creative product dissemination. Digital empowerment of cultural and creative industries is an industrial form that uses digital technology as a means, with the production, distribution, circulation, and consumption of cultural and creative products and services as the core, capital as the link, and mass consumption as the driving force.[3] The cultural and creative industry has also provided new application scenarios, demand driven and value evaluation for computer technology, endowing it with stronger flexibility, diversity and intelligence.[4,5]

At the Creative Level

Digital tools such as 3D modeling software (such as Autodesk Maya, Blender, etc.) and digital drawing boards (represented by the Wacom series) allow artists to break through the limitations of traditional materials and achieve imaginative creative ideas. Taking the field of animation production as an example, Pixar Studios fully utilized its independently developed advanced digital animation software based on the RenderMan rendering architecture in the production of "Coco". Its detailed character modeling technology for every hair and realistic light and shadow rendering effects make the world of spirits come to life. The creators easily designed complex and emotionally expressive character movements through software control, such as the subtle tremors and facial expressions of Mig's hands while playing guitar, greatly shortening the originally long production cycle. The film ultimately conquered global audiences with stunning visual effects and achieved high box office and reputation.

Digital technology has provided the greatest ability to absorb, generate, store, and process various cultural elements to date. The cultural industry has greatly improved efficiency, and cultural products have more diverse forms and richer expressive power.[6] Houdini software is often used in film and television special effects production. Based on a node based workflow, it provides high creative flexibility for special effects artists and can simulate complex physical phenomena such as explosions, fluid effects, etc., adding stunning visual impact to film and television works. The magnificent underwater world special effects in "Aquaman" rely heavily on Houdini's precise simulation of hydrodynamics, making the audience feel like they are there.

Production Process

Digital production lines have been widely applied in the manufacturing of cultural and creative products, achieving precise and efficient mass production. For example, Bandai Namco, a well-known anime peripheral manufacturer in Japan, uses high-precision digital mold design software (such as Siemens NX) and advanced 3D printing technology (taking Stratasys series printers as an example) to quickly produce prototypes for popular

anime characters. Through digital processes, production details can be quickly adjusted based on real-time market feedback. For example, a popular Gundam model can quickly optimize the mobility design of mecha joints according to fan needs, achieve mass production in a short period of time, reduce production costs, and ensure highly consistent product quality, meeting the collection needs of global fans.

In addition, in the field of cultural and creative product printing, digital printing machines such as the HP Indigo series, with their variable data printing capabilities, can quickly print personalized cultural and creative products according to different design needs, such as customized art postcards, laptops with personal photos or exclusive patterns, etc., meeting the increasingly diverse needs of consumers.

Communication Channels

The popularity of the Internet and mobile terminals, the rise of social media and streaming media platforms, and the spread of cultural and creative content are endless. Taking Tiktok as an example, it relies on the ByteDance Company's personalized recommendation algorithm model. Through the analysis of users' browsing history, likes, comments and other multi-dimensional data, it accurately pushes creative short videos that meet users' interests. A large number of folk creative short video creators use this platform to recommend algorithms and become popular quickly. Ding Zhen's use of a short video showcasing the beautiful scenery and innocent smile of his hometown Litang has attracted public attention, and the Litang cultural and tourism industry has flourished under this trend; In the field of music, streaming platforms such as Spotify use collaborative filtering algorithms, combined with users' music preferences, playback habits, and other data, to provide accurate exposure opportunities for independent musicians around the world. They do not need to rely on the complex distribution channels of traditional record companies. After uploading their works, they can reach audiences around the world. For example, Billie Eilish's original music released on the platform in the early days gradually accumulated popularity and opened the road to global music superstars.

Virtual exhibitions and immersive experiences empowered by virtual reality (VR) and augmented reality (AR) technologies bring new dimensions to the dissemination of cultural and creative industries. Museums use VR technology to create virtual exhibition halls, allowing visitors to immerse themselves in cultural relics without leaving their homes. For example, the VR exhibition launched by the British Museum allows global audiences to break free from time and space constraints and experience precious cultural relics such as the Rosetta Stone up close; Some art exhibitions use AR technology to allow visitors to scan paintings with their mobile phones to obtain expanded information such as creative backgrounds and artist stories, enhancing interactivity and fun, improving the infectivity of cultural and creative works, and comprehensively expanding the effectiveness of industrial dissemination, stimulating new vitality in cultural consumption.

THE PATH OF COMPUTER TECHNOLOGY EMPOWERING THE DEVELOPMENT OF CULTURAL AND CREATIVE INDUSTRIES

The rapid development of computer technology has brought new opportunities for the cultural and creative industries. From content production to dissemination, consumption, and business model innovation, digitalization has empowered the transformation and upgrading of traditional cultural and creative industries. As shown in the Figure 1, it presents the path of computer technology to empower the development of cultural and creative industries.

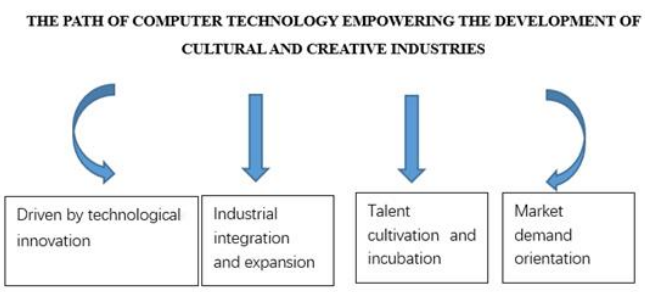

Figure 1. Analysis of the development path of cultural and creative industries based on computer technology

Technological Innovation Driven Path

Software development and application

Continuously investing in the development of advanced digital creation software, such as in the animation field, in addition to Pixar's software based on the RenderMan rendering architecture, there are also proprietary tools developed by DreamWorks for character modeling and animation production, helping creators break through traditional constraints. Taking the Kung Fu Panda series as an example, its unique character movement style and delicate visual texture cannot be separated from the precise control of animal hair and muscle movement simulation by internal development software, bringing new visual enjoyment to the audience and promoting the animation industry to a higher artistic level.

Hardware upgrade support

Keeping up with hardware technology iteration, providing strong support for cultural and creative production. The development of high-end graphics processing units (GPUs) has made real-time rendering of large 3D scenes a reality. In film and television special effects production, NVIDIA's professional GPUs, combined with software such as Houdini, can simulate complex special effects such as explosions and fires at a faster speed, shorten the production cycle, enhance the visual impact of film and television works, and meet the growing viewing needs of audiences.

Industrial Integration and Expansion Path

Cross media integration

Artificial intelligence has improved the profitability of the media industry, and the integration of intelligent media has enabled close cooperation between different media professions, achieving interaction between business thinking and audiences.[7] Cross media integration can promote the integrated development of cultural and creative industries with other industries, enhance the added value and competitiveness of the industry. For example, the integration of digital media art and cultural and creative industries has promoted the rapid development of cultural and creative industries, occupying an increasingly important position in the current cultural industry. In the context of economic globalization, the cultural industry has become one of the effective ways for cultural exchange between countries, and the development of digital media art has brought new opportunities and challenges to the cultural and creative industries

Breaking the boundaries of traditional media and achieving seamless circulation of cultural and creative content on multiple media platforms. For example, a popular novel can be adapted into various forms such as manga, animation, film and television, games, etc., and disseminated through different media platforms to attract different audience groups. The "Grave Robbers' Notes" series, starting from online novels, gradually expanded to film and television adaptations and mobile game development. Each version echoes each other, utilizing the dissemination characteristics of different media to build a huge fan community, greatly expanding the commercial landscape of the cultural and creative industry.

Collaboration with traditional industries

Integrating digital technology into traditional manufacturing, tourism, and other industries to stimulate new business models. In the manufacturing industry, smart home products have become a model for the integration of cultural creativity and traditional home appliance industries, such as Xiaomi's ecological chain's speakers with artistic decorative panels and intelligent interactive functions, which have both practical and aesthetic value; In the tourism industry, digital technology is used to create smart tourist attractions, and mobile APP is used to provide tourists with services such as scenic spot guidance and virtual tour guide explanation, so as to improve the tourist experience. For example, the intelligent tourism system of Mount Huangshan Scenic Area allows tourists to easily obtain scenic spot information, optimize tour routes, and realize the digital upgrading of traditional tourism industry.

Talent Cultivation and Incubation Path

Optimization of college majors

Universities adjust the curriculum of digital media related majors, increase the proportion of practical teaching, and introduce real project cases from enterprises. For example, the Digital Media Art major at Beijing Film Academy collaborates with multiple film and television production companies to allow students to participate in actual film special effects production projects, master software operation skills such as Houdini and Maya in practice, and quickly adapt to industry needs after graduation, providing professional technical talents for the industry.

Strengthening on-the-job training

Conduct a combination of online and offline skills enhancement training for in-service personnel. Offline digital creative workshops will be held, inviting industry experts to provide on-site guidance. Online, advanced courses will be provided through platforms such as NetEase Cloud Classroom, covering cutting-edge knowledge such as artificial intelligence assisted design and new digital marketing methods. This will help practitioners continuously update their knowledge system and adapt to the industrial changes brought about by the rapid development of digital technology.

Market Demand-Oriented Path

Big data precision marketing

By utilizing big data accumulated on e-commerce and social media platforms, analyze consumer interests, preferences, and purchasing behavior to achieve precise promotion of cultural and creative products. Taking Taobao's cultural and creative channel as an example, through algorithm recommendations, Hanfu accessories, antique stationery and other products are pushed to users who like antique cultural and creative products, improving product conversion rates. At the same time, based on user feedback data, it guides merchants to optimize product design and marketing strategies, achieving precise matching of supply and demand of cultural and creative products.

Personalization

Data and algorithms have become the 'new production factors' and' new flow lines' of the cultural industry.[8] Realize personalized customization of cultural and creative products based on digital technology. As with the online customization platform Canva, users can upload images and edit text on their own, and use the platform's massive templates to quickly design and produce personalized cultural and creative products such as posters and business cards, meeting the diverse needs of individuals and enterprises and expanding the market segmentation of the cultural and creative industry.

The integration of digital technology and cultural and creative industries has given rise to many innovative consumption scenarios, greatly upgrading the consumer experience and expanding the vast market space. Online concerts are a typical example. Taking well-known singers such as Mayday and Jay Chou's online concerts as an example, with the help of high-definition live streaming, multi camera switching, real-time interaction and other digital technologies, the time and space constraints are broken, allowing global fans to immerse themselves in the stunning audio-visual feast without leaving their homes, and feel the lively atmosphere on site. Audiences can express their love and share their feelings in real time through bullet comments, and interact with their idols across screens. According to statistics, Tiktok's online concerts have seen more than 10 million people and hundreds of millions of likes, and the number of social media related topics has soared, which not only meets the needs of fans, but also promotes new formats such as online aid, digital peripheral sales, etc., expands the profit model of the music industry, excavates potential consumer groups, and activates the music consumption market.

Immersive cultural and tourism projects are a highlight of integrated innovation. Museums around the world use VR and AR technology to create immersive exhibitions, such as the "Tang Tomb Mural VR Experience Exhibition" launched by Shaanxi History Museum. Visitors wear VR devices and instantly travel back to the Tang Dynasty to observe the process of mural creation up close, experience the charm of the Tang Dynasty, break the traditional static limitations of exhibitions, enhance interactivity and fun, and improve cultural dissemination

effects. In terms of theme parks, Shanghai Disneyland's "Pirates of the Caribbean - Battle of Fallen Treasures" project integrates digital special effects, dynamic seating, and real-life scenery. Tourists take boats to shuttle through a fantasy adventure world that interweaves virtual and reality, creating a strong sense of immersion and attracting a large number of tourists. It drives surrounding catering, accommodation, and cultural and creative consumption, forming a complete industrial chain and opening up new growth paths for the cultural and tourism industry. It meets consumers' pursuit of high-quality and personalized cultural and tourism experiences, and expands the cultural and tourism market from first tier cities to second - and third tier cities.

THE OPPORTUNITIES BROUGHT BY DIGITAL TECHNOLOGY TO THE CULTURAL AND CREATIVE INDUSTRIES

Expand Market Boundaries

Computer technology can change the business and operational models of the cultural and creative industry.[9,10] The online platform gathers a massive number of users, providing a broader sales and display space for cultural and creative products. Taking the domestic niche independent cultural and creative studio "Unidirectional Space" as an example, it focuses on the development of artistic books, cultural and creative stationery and other products. With the help of e-commerce platforms such as Taobao and Weidian, it sells book peripherals and stationery with unique design concepts to various parts of the world. A notebook with niche poetry printed on it, promoted through social media marketing and e-commerce platforms, has sold over tens of thousands of copies, tapping into the huge commercial potential of the niche art enthusiasts market and turning artistic sentiment into tangible economic benefits.

The big data analysis technology behind e-commerce platforms, such as Alibaba's Business Advisor, can help cultural and creative businesses accurately understand market trends and consumer preferences, thereby optimizing product design, adjusting marketing strategies, and further expanding market share. For example, by analyzing data such as age, region, and consumption frequency of users who purchase art laptops, businesses can launch new products that are more tailored to their target audience, such as pink series designed for young female consumers and illustrated account sets.

Generate New Business Models

Virtual reality technology (also known as immersive computing technology) provides a unique way to interact with the emerging digital world. VR technology is often described as a set of techniques that allow a person to perceive the position and actions of participants, alter or enhance one or more sensory feedback, thereby creating spiritual immersion or a sense of appearance in a simulated environment.[11]

Virtual reality (VR) and augmented reality (AR) technologies have given rise to immersive cultural and tourism experience formats. Like the VR immersive exhibition launched by the Palace Museum, visitors wear VR devices developed based on hardware platforms such as HTC Vive and Oculus Quest, combined with customized VR content creation software (such as the Palace Museum scene application created by Unity 3D engine), as if traveling through time and space, immersing themselves in the ancient palace feast scene, closely observing the details of cultural relics, and experiencing the profound charm of historical culture; In the field of digital collectibles, CryptoPunks is one of the earliest digital collectibles projects on the Ethereum blockchain. With its unique pixel style avatar design and the use of Ethereum smart contract technology to give each avatar a unique ownership certificate, CryptoPunks has sparked a global collection craze and activated new vitality in the digital collectibles market. Many artists and brands have followed suit, exploring new paths in the digital art business.

Blockchain technology not only ensures the ownership of digital collectibles, but also plays a role in the supply chain finance of cultural and creative industries. By recording the entire process of creative conception, production, and distribution of cultural and creative projects through distributed ledgers, financial institutions can provide more convenient financing services for cultural and creative enterprises based on trusted data, and help small cultural and creative enterprises grow.

Optimize Industrial Synergy

Digital technology builds a communication bridge between the upstream and downstream of the industry, from creative ideas and material sharing to joint promotion, with close collaboration in all aspects. In the production of the Marvel Cinematic Universe series, special effects companies, post production teams, and filming crews distributed around the world are closely connected through cloud based collaborative work platforms (such as the film and television production collaboration platform built by AWS's cloud service suite). During the filming phase, the production team uploads materials in real-time to the cloud, and the special effects company synchronously obtains and uses digital special effects technology (such as the proprietary special effects software of Industrial Light and Magic Company) to create cool skill special effects for superheroes according to the requirements of the creative team. The post production team then performs fine editing and color grading, seamlessly connecting each link to greatly improve overall production efficiency and create a coherent and stunning movie universe.

In the animation industry, online project management tools such as Trello, Asana, etc. are widely used. Animation production teams can clearly divide tasks, track progress, share materials, and ensure efficient collaboration in various processes such as comic creation, animation production, dubbing, and distribution. For example, during the production process of a Japanese anime, tasks such as script writing, storyboarding, coloring, etc. are assigned to different members through the Trello board, and the progress is updated in real time, making it clear to team members at a glance, avoiding task delays, and ensuring the anime is launched on time.

THE CHALLENGES THAT DIGITAL TECHNOLOGY WILL FACE IN EMPOWERING CULTURAL AND CREATIVE INDUSTRIES

Although digital technology has brought disruptive changes to the cultural and creative industries, there are still many challenges in its promotion and application. These challenges mainly focus on the limitations of the technology itself, industry adaptability, and social and cultural impacts. As shown in the Table 1, it illustrates the development trend of China's cultural and creative industries.

Table 1. Development trends of China's cultural and creative industry

Cultural and creative products are becoming important carriers for cultural inheritance, emotional and conceptual expression	In the era of "everything is possible+ cultural and creative", whether it is daily necessities, local specialty catering, high-tech or traditional skills and culture, they can all be integrated into cultural and creative products, becoming carriers that can concretely inherit culture and express emotions and ideas
Technological empowerment: Combining virtual and real to promote the transformation and upgrading of the cultural and creative industry	With the advent of the digital economy era, the development of new technologies has become an important driving force for promoting industry innovation and upgrading. AR, WR, VR. The continuous implementation of new technologies such as wearable devices and metaverse promotes the emergence of more new application scenarios
'Millet' is becoming a hard currency in the cultural and creative product industry, and the small yet beautiful circle culture may be the mainstream model for the future of the industry	The industry is de branded, and the niche players create new play methods to reverse the manufacturer's "roll" products. The market power of some of the traffic innovation products represented by anime is transferred to consumers, who become the key force for innovation and driving the development of the industry

Shortage of Technical Talents

The shortage of composite talents who understand both cultural creativity and digital technology hinders industrial innovation and upgrading. At present, the curriculum of digital media majors in universities generally focuses on imparting theoretical knowledge, with insufficient proportion of practical courses. Moreover, practical projects are disconnected from current popular application scenarios such as game development and short video production in the market. After graduation, students enter game companies and are often at a loss when faced with complex game engine development environments (such as Unity engine, Unreal Engine engine) and real-time interaction design requirements. They need to spend a lot of time relearning, making it difficult to quickly adapt to the position, resulting in high recruitment and training costs for enterprise talents.

At the same time, the application of emerging digital technologies such as artificial intelligence in the cultural and creative industries is becoming increasingly widespread. From intelligent writing assistance to image generation based AI assisted design, professional talents are needed to master them. However, the updating of relevant courses in universities lags behind, and students lack understanding of the combination of cutting-edge AI technology and cultural creativity, resulting in a continuous widening talent gap in this area.

Content Homogenization

The replicability of digital technology has led to some cultural and creative products following the trend seriously and lacking original content. For example, the "Internet Red glass walkway" emerging in various places has a single mode. It only builds transparent walkways in mountains or tall buildings, and attracts tourists to clock in only by means of filter beautification publicity. It lacks the characteristic experience of deep integration with local nature, history and culture. Tourists feel dull after visiting one place, which is difficult to maintain tourists' interest, resulting in resource waste and vicious competition.

In the field of digital art creation, due to the ease of operation of some common digital painting software, a large number of illustration works with similar styles flood the internet. These works often lack deep creativity and simply imitate popular styles, making it difficult to stand out in the market. Over time, this has damaged the entire digital art ecosystem.

Copyright Protection Challenges

Digital works have convenient dissemination and frequent infringement. In the film and television industry, as soon as a popular TV series aired a few episodes, pirated online resources flooded some illegal film and television websites. For example, during the popular season of "Sweeping the Black Storm," a large number of unauthorized pirated links spread in social groups and niche forums, with millions of views, seriously dampening the enthusiasm of creators and producers; The same goes for the music industry, where some independent musicians' hard-earned songs are illegally downloaded and covered as soon as they are released. When defending their rights, they face massive amounts of infringement information, difficult evidence collection, high costs, and lengthy legal proceedings, which deter creators.

Although blockchain technology has provided a new way to verify the rights of digital works to a certain extent, in practical applications, due to the different standards of different blockchain platforms, cross platform copyright verification and management are difficult.

Technical Bottleneck

The Oxford Handbook on Creative Industries points out that there are four main drivers for the development of creative industries, namely demand, technology, policy, and globalization; Among them, technology is the main force that accelerates and drives change.[12]

In the process of integrating digital technology with cultural and creative industries, there are many technological bottlenecks that seriously restrict the deep development of the industry. Insufficient computing power has become the primary challenge, and in fields such as film and television special effects rendering and large-scale digital art creation, the demand for massive data processing places extremely high demands on computing power. Taking 3D animation film production companies as an example, complex scene rendering often takes several months. Even if cloud computing power is rented, high costs and long waiting times still hinder the improvement of creative efficiency. Due to limited computing power, the image precision and lighting effects are difficult to reach the international top level, weakening the competitiveness of the work market.

The problem of inconsistent technical standards is also very prominent, with different formats between digital cultural and creative platforms and software, making data exchange difficult. Due to the lack of standards for 3D model format and image resolution in the display of digital collections in museums, cross platform display is prone to compatibility issues, greatly reducing the audience experience and restricting the diversified development of cultural and creative products, hindering industrial collaborative innovation.

The application of some cutting-edge digital technologies in the cultural and creative industries is difficult to implement. Although virtual reality (VR) and augmented reality (AR) technologies have broad prospects, there

are still problems such as expensive hardware equipment, uncomfortable wearing, and difficult content adaptation. In cultural and tourism scenic spots, VR experience projects often suffer from high equipment maintenance costs, slow content updates, low tourist revisit rates, inability to continuously attract customers, and difficulty in converting technological advantages into stable commercial profits, which restricts the pace of industrial upgrading.

RESPONSE STRATEGY

Construction of Talent Cultivation System

Joint education between universities, vocational colleges, and enterprises to create internship and training bases, and customize the cultivation of composite talents that meet the needs of the industry; Encourage employees to continue their education and improve their skills. For example, Communication University of China has partnered with Tencent Games to offer a special training course on game development. The course is jointly designed by senior engineers from enterprises and professional teachers from universities. During their school years, students directly participate in the actual project development of Tencent Games, and after graduation, they are given priority to join Tencent's game studio, achieving precise alignment between talent cultivation and enterprise employment needs; At the same time, online learning platforms such as NetEase Cloud Classroom have launched a series of digital creative skills courses for employees to learn and improve in their spare time, covering multiple fields such as animation production and digital marketing, providing convenience for practitioners to continuously recharge.

In addition, some technology companies and universities jointly establish joint laboratories, such as Huawei's digital media joint laboratory with universities, which focuses on the application research of cutting-edge technologies such as 5G and AI in the cultural and creative fields, allowing students to be exposed to the forefront of the industry in scientific research practice, reserve knowledge and skills in advance, and provide high-end innovative talents for the industry.

Encourage Originality and Differentiated Development

Establish a cultural and creative innovation fund to reward original and excellent works; Guide enterprises to dig deeply into the unique value of regional culture and niche culture, and create differentiated brands. For example, the "Earth Building Tamping Skill Inheritance Experience Tour" project launched in the Earthen Building in Fujian Province area enables tourists not only to visit the ancient earth building style, but also to participate in the ramming process, learn the history and culture behind the traditional architectural skills, distinguish from conventional sightseeing tourism, attract tourists with in-depth cultural experience, and create local cultural tourism characteristic business cards.

American scholar Don Tapscott pointed out that whether traditional products can be given new ideas and creatively developed in the new economy determines success or failure, that is, "whether there is creativity determines whether wealth can be created in the new economy era.[13] The government cultural department can organize various cultural and creative competitions to provide a platform for showcasing original works, inspire creators, and discover outstanding talents and projects. At the same time, utilizing big data analysis to explore niche cultural needs, guiding enterprises to accurately develop distinctive cultural and creative products.

Strengthen Copyright Protection Mechanism

The vigorous development of cultural and creative industries cannot be separated from effective online copyright protection. The creative achievements of the cultural and creative industry need to be protected in order to promote the prosperity and development of the industry.[14]

Improve digital copyright laws and regulations, and use technologies such as blockchain encryption and digital watermarking to trace the source of works; Establish convenient channels for safeguarding rights, strengthen supervision, and purify the industrial ecosystem. The European Union has issued the "Digital Single Market Copyright Directive", which clarifies the ownership and usage rules of digital content copyright, providing legal basis for copyright protection in the European digital creative industry; Domestic Alibaba and other Internet giants use blockchain technology to build a digital copyright protection platform. After the creators' works are uploaded,

they automatically generate tamper proof copyright certificates. Once infringement is found, they can quickly submit evidence through the platform, cooperate with regulators to combat infringement, and effectively protect the rights and interests of creators.

The National Copyright Administration and other departments have strengthened cooperation with the Internet platform to establish a fast transfer mechanism for infringement clues. For example, when the short video platform finds infringement videos, it can quickly transfer the clues to the copyright law enforcement department to speed up the investigation. At the same time, promoting industry self-discipline, establishing a cultural and creative industry copyright protection alliance, member units supervise each other, share infringement blacklists, and jointly create a good industrial environment.

CONCLUSION

Empowering technological innovation is beginning to transform into a source and carrier of cultural creativity.[15] Computer technology, with its powerful computing power and diverse application scenarios, is comprehensively promoting the deep integration and high-quality development of cultural and creative industries. Through the widespread application of technologies such as artificial intelligence, big data, virtual reality, augmented reality, and blockchain, the cultural and creative industry has achieved comprehensive innovation and breakthroughs in creative efficiency, dissemination models, consumer experience, and business models. The integration of technology and culture not only greatly expands the boundaries of cultural and creative industries, but also injects endogenous driving force for sustainable development.

Firstly, computer technology has assisted in the digital and intelligent upgrading of cultural and creative industries, improving the efficiency and diversity of content creation. Technologies such as virtual reality, 3D modeling, and artificial intelligence generated content provide creators with richer tools and more efficient creative abilities, while also giving rise to new art forms and interactive experiences, bringing consumers more attractive cultural products.

Secondly, the cultural dissemination empowered by technology breaks the limitations of geography and time. Digital platforms, personalized recommendations, and virtual social networks make the dissemination of cultural content more precise, efficient, and interactive. This model not only meets the diverse needs of cultural consumption in the era of globalization, but also enables excellent cultural content to achieve wider dissemination and deeper influence.

Once again, computer technology has driven innovation in the business models of cultural and creative industries, creating a new value chain for the industry through intelligent marketing, digital copyright protection, and the development of virtual economy. For example, blockchain technology provides a transparent and reliable copyright management system, while digital asset forms such as NFTs have opened up emerging trading markets for cultural and creative products.

However, this deep integration also faces challenges, such as the balance between creative originality and technology generated content, ethical risks of data privacy and algorithm fairness, and the need to enhance the technical literacy of practitioners. Therefore, while embracing computer technology, the cultural and creative industries need to pay attention to ethical norms and legal guarantees for technological applications, strengthen support and protection for multicultural content, and ensure the coordinated development of technological innovation and cultural values.

Looking ahead, with the continuous advancement of computer technology, the cultural and creative industries will further move towards intelligence, personalization, and globalization. The continuous innovation of technology will bring more possibilities to the cultural and creative field, and the unique charm of the cultural and creative industry will in turn stimulate new directions for technological development. In this dynamic balance, the cultural and creative industries will become an important growth pole in the digital economy era, while also playing a greater role in cultural dissemination, social innovation, and global communication.

In short, the deep integration of computer technology and cultural and creative industries is a two-way empowering revolution, opening up a new development path for the cultural and creative industries. In the future,

this integration will continue to drive industrial innovation and value enhancement, while also injecting strong impetus into the prosperous development of the global cultural ecology.

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