



# China's Digital Creative Multimedia Industry Development and Sustainable Development Innovation Direction

ShengXuan Zhang<sup>(✉)</sup>, Zainudin Siran<sup>(✉)</sup>, and Mohd Hafizuddin Mohd Yusof<sup>(✉)</sup>

Faculty of Creative Multimedia, Multimedia University, 63100 Cyberjaya, Selangor, Malaysia  
1211400249@student.mmu.edu.my, {zainudin.siran,  
hafizuddin.yusof}@mmu.edu.my

**Abstract.** The digital creative multimedia industry, which invests in science, technology, culture and arts, and influences culture with economic value, is the sum total of creative content industry and creative manufacturing industry, which use digital technology. China was listed as a new strategic industry for the first time during the 13th Five-Year Plan period, which played an important role in the transformation and upgrading of China's industry and the development of the digital economy. This paper studies the development direction of digital creative multimedia industry from macro level, summarizes the development experience of digital creative multimedia industry in China, and discusses the future industry development suggestions. Through the comparative analysis of the concept, connotation and development thoughts of the digital creative multimedia industry at home and abroad, this paper systematically combs the characteristics, present situation and existing problems of the development of the digital creative multimedia industry in china, and forms the overall development thoughts of the digital creative multimedia industry. Firstly, the digital creative multimedia industry is summarized. Secondly, it analyzes the present situation and problems of China's digital creative multimedia industry. The evaluation index system is constructed again. Finally, the data were processed by factor analysis and the comprehensive score was obtained. This paper puts forward four directions for the continuous creative development of digital culture creative multimedia industry in china: digital culture creative equipment innovation, digital culture connotation innovation, sustainable creative design innovation, fusion permeation innovation development, and puts forward countermeasures and suggestions in the fields of science and technology, innovative institutions, platform enterprises, talent training, regulatory services and industry agglomeration.

**Keywords:** Digital creative industry · Cultural innovation · Technology upgrade · Innovative design

## 1 Introduction

At present, the rapid development of digital technologies represented by 5G such as artificial intelligence, cloud computing, Internet of Things, fifth-generation mobile communications, virtual reality, blockchain and others is driving the transformation of the digital

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F. Mustaffa et al. (Eds.): ICCM 2022, ASSEHR 706, pp. 5–14, 2023.

[https://doi.org/10.2991/978-2-494069-57-2\\_2](https://doi.org/10.2991/978-2-494069-57-2_2)

creative multimedia industry and pushing it to new heights. Digital creative multimedia industry is a concentrated manifestation of the comprehensive national strength and international competitiveness of a country. In recent years, China has taken the development of digital creative multimedia industry as a strategic emerging industry, and achieved remarkable results. In this context, the study of foreign digital creative multimedia industry development experience has practical significance. Developed countries attach great importance to the development of digital creative multimedia industry as an important content to preempt future development, consolidate technological innovation advantages and expand cultural soft power and influence.

In keeping with the international trend, digital creative multimedia industry has been actively nurtured and developed. At present, China has more than 100,000 enterprises of all kinds, employing about 100 million people. In 2015, the value added of cultural industries as a percentage of GDP reached 4.5 per cent, an increase of 4 percentage points over 2010. Digital creative multimedia industry is developing rapidly. The market potential is huge. Digital Creative Multimedia Industry has become one of the strategic directions of China's industrial development. The National Strategic Emerging Industries Development Plan of the 13th Five-Year Plan proposes that by 2020, China will develop a culture-led, technologically advanced and chain-integrated digital creative multimedia industry with a value of 8 trillion yuan. China's digital creative multimedia industry has entered a period of rapid growth and faces rare development opportunities and great growth potential.

## **2 Industrial Application Concept of Digital Creative Multimedia**

At present, there is no uniform definition of digital creative multimedia industry in the world. There are similar concepts such as creative industry, copyright industry, data content industry and cultural creative industry. From the point of view of national policies, digital creative multimedia industry is an important hand for a country or region to promote the transformation and upgrading of industrial structure and innovative entrepreneurial activities under the new normal of economy. In recent years, the world's major economies have introduced a series of policy measures to support the development of digital creative multimedia industry. The developed countries have different ways of understanding and developing the digital creative multimedia industry. For example, the United States connects the entire digital creative multimedia industry through copyright, allowing digital content and technology to develop simultaneously. The UK has a culture-driven lightweight creative industry with a "big culture" that highlights integrated management concepts and adapts to a mix of creative and digital elements.

In order to promote and lead the high-quality development of digital creative multimedia industry, China has clarified the connotation and definition of digital creative multimedia industry. On the basis of this, combined with the current situation and existing problems of China's digital creative multimedia industry, some countermeasures and suggestions are put forward to promote its healthy and sustainable development. In recent years, China's digital creative multimedia industry has developed rapidly and achieved remarkable results. But many challenges remain. The 13th Five-Year Plan for

the Development of New and Strategic Industries makes a top-level design for the long-term development of China's digital creative multimedia industry from four aspects: digital culture and multimedia equipment innovation upgrade, digital content development, sustainable innovative design development, and related industry integration. The Strategic New and Emerging Industries Classification (2018) provides a comprehensive definition of the national economic sectors, key products and services involved in the digital creative multimedia industry, and provides guidance for the normative, orderly and rapid development of China's digital creative multimedia industry.

Specifically, China's digital creative multimedia industry is segmented into design, film and media, digital publishing, animation games, online education, tourism, residential environment design, fashion and apparel, sports health, toys, cultural heritage, etc., covering digital, information equipment, software, etc. Through the analysis of relevant literature at home and abroad, it is found that the current research on digital creative multimedia industry mainly focuses on three aspects: one is theoretical research; Second, the technology application research; Third, a study of policy recommendations. Among them, the majority of foreign research results. It can be seen that the concept of digital creative multimedia industry in China is different from that of developed countries, with more emphasis on the organic integration and synergistic development of science, technology, culture and creative industries.

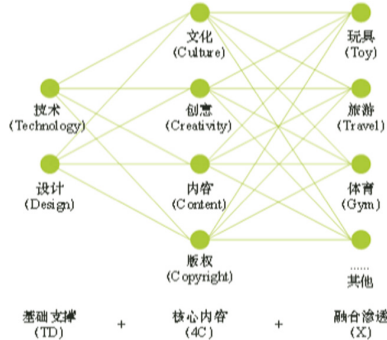
## **Features of the Digital Creative Multimedia Industry**

### **(i) Full network structure**

Digital Creative Multimedia Industry is an industry supported by digital creative multimedia technology and sustainable creative design, with cultural creativity, content production and copyright utilization at its core, with integration penetration driving the development of the surrounding industry areas. Against the background of the rapid rise of China's cultural industry, digital creative multimedia industry has become one of the important driving forces to upgrade and transform the industrial structure. This paper makes a systematic analysis and research on China's digital creative multimedia industry. Firstly, the characteristics of network organization are analyzed. From the structural point of view, digital creative multimedia industry has three layers of network structure: the first layer provides the key technology support for digital creative, products and services; The second layer is the core core production and services, mainly for consumers to provide cultural and creative content, copyright creation services; The third layer is the output layer, including the fusion penetration, covering the toy industry, tourism industry, recreation industry, sports industry and other digital nodes.

### **(ii) Multi-directional value output**

The growth of the digital industry depends on imagination, manufacturing and a sense of justice, with imagination playing a key leading and organizing role. There is an interactive mechanism between the application of digital technology and the digital culture and creative industry. On the one hand, the digital technology innovation brings the change of the cultural and creative product form. On the other hand, cultural and creative enterprises have used digital technology to transform their business models. The innovation of digital culture and multimedia technology



**Fig. 1.** Panorama of digital industrial structure.

equipment requires high imagination, manufacturing ability and knowledge level, while the development of sustainable innovative design requires improvement of imagination ability and knowledge level.

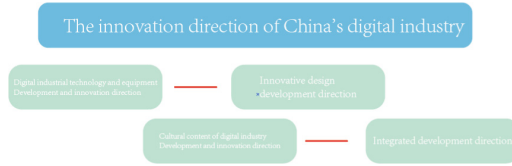
(3) Having a strong internal production drive

With the digital industry actively introducing new digital technology, the industrial structure and business model are constantly changing and innovating, the uncertainty of the industrial boundary is increasing and has strong internal production drive. The DCS platform rebuilds the relationship between content creators and content consumers through digital technology (such as AI) applications. Digital technology enterprises will accelerate the deployment of digital creative multimedia industries, give full play to technological and platform advantages, and promote rapid development in the fields of online literature, film, video, games, animation, music and sports. Digital creative multimedia industry has higher economic value and social significance than traditional cultural creative industry. Digital technology is driving structural change in the digital creative multimedia industry, reducing the cost of switching industries. Creative content creators can use digital platforms to distribute content, content publishers can easily transform into content creators, and consumers of creative content and products can use platform-based businesses, such as short video platforms, to create and share creative content and become content producers (Fig. 1).

### 3 Current Situation and Problems Facing the Digital Creative Multimedia Industry

(i) Comprehensive development

As one of the country’s strategic emerging industries, Pdf’s digital creative multimedia industry has made great contributions to the country’s economic and social development. According to cultural industry statistics, revenue from cultural and related industries larger than China in 2019 stood at 866.24 billion yuan, up 7.0 percent from 2018 and slightly higher than the growth of China’s equipment manufacturing industry during the



**Fig. 2.** Content composition of innovation development of digital creative industry.

same period. At the same time, the share of cultural industries in the national economy has been increasing. At the beginning of 2020, due to the pneumonia outbreak caused by the novel coronavirus infection, “No School Shutdown” became an important initiative at the National Conference on Education Work. This shows that China’s relevant industries have maintained steady and relatively rapid development, and its industrial structure has been continuously optimized. In terms of segment, the content creation production and cultural consumption terminal production industries both recorded revenue of over RMB 1.6 trillion in 2019, making them the main growth points of the industry. The news information services, creative design and cultural investment and operation industries grew by more than 10% each.

## (2) Staged Development Achievements

During the 13th Five-Year Plan, under the impetus of a series of important policies, China’s digital creative multimedia industry has achieved many achievements (Fig. 2).

### 1. Digital Culture Multimedia Technology Equipment Innovation

With the rapid development of digital technologies such as VR, AI, 5G, Ultra HD (4K/8K), holography, and sensory interaction, digital cultural creative devices are innovating in the direction of higher resolution, better interaction, more diverse media formats, and more immersive experiences.

In the field of VR and augmented reality (AR) technology equipment, the industry has gradually shifted its focus from whole-machine subs to core component development, with a focus on enhancing software development through generic technologies such as upgraded network architecture, 3D modeling, and high-performance algorithms. Among them, VR hardware equipment is continuously upgraded; The virtual reality application scene continues to expand; Virtual experience services are rising rapidly and becoming more and more popular. The industry application accelerates the landing, forming a good market pattern. The supply of digital content continues to be abundant and the industrial chain continues to extend downstream. In addition, VR/AR fusion innovations are integrated with technologies such as AI, 5G, 4K / 8K to drive the development of new products, processes, and models.

### 2. Digital Content Innovation Development

In recent years, China’s digital content industry has maintained a strong momentum of development, has become an important industry to lead cultural revitalization and achieve the goal of cultural powerhouse, and has become an important force in China’s digital economy.

In 2018, the total revenue size of China's digital publishing industry was about 8330.8 billion yuan, a 17.8 percent year-over-year increase. With the advancement of digital technology and industrial policy, the digital transformation of the traditional publishing industry has been further upgraded and the digital publishing industry has continued to grow steadily in many fields [6]. Artificial intelligence (AI) has been widely used in various fields as a new technological innovation. The popularization of AI technology in the field of content production has led to a new digital content production method. Driven by technologies such as the Internet and AI, the knowledge services industry has flourished, providing high-quality knowledge content and service experiences and changing the way traditional knowledge is produced and consumed.

By the end of 2018, China had become the world's second-largest online cultural entertainment market and the largest online game "Go Away," exporting more than 11,000 works of online literature overseas as an online literary powerhouse. With the popularization and renewal of mobile reading terminal, the era of "literature for all" has come. At the same time, IP development models based on the "fan economy" are on the rise. In addition, live and short video platforms have been globalized, entering application markets in several countries and regions, creating new content production and creative communities, and creating new forms of employment and services.

### 3. Sustainable Innovative Design Development

At present, the agglomeration and radiation pattern of China's sustainable innovation design region has been basically formed. In the new round of scientific and technological revolution and industrial transformation, countries are competing to build creative industrial belts with innovation as their core competitiveness, and promote innovative nation building through the establishment of national high-tech zones. In many parts of the world, cultural and creative industries have been developed as pillar industries. UNESCO has awarded Shenzhen, Shanghai, Beijing, Wuhan, Hangzhou, Suzhou, Jingdezhen, Qingdao and Changsha as "China's Design Capital", "Craft Capital", "Folk Art Capital", "Film Capital" and "Media Art Capital". The first China (Hangzhou) International Intelligent Products Expo on the Digital Economy was held in 2019 against the backdrop of advances in fusion applications driven by the convergence of digital AI technologies.

In the field of sustainable innovative design, many key enterprises are internationally competitive. However, there is still a big gap between domestic enterprises and multinationals, especially the low level of technological innovation. How to improve the capability of independent innovation has become one of the urgent problems. Technological innovation cannot be separated from the construction of innovation platform. Therefore, it is imperative to construct an innovative design platform. China has successfully formed a strategic alliance for sustainable innovative design industry, integrating the forces of production, learning, research and development and innovative resources, and building a diversified technology service platform, which will provide basic and key support for enhancing the country's overall capacity for sustainable innovative design and implementing innovative innovation-driven development strategies.

### (3) Problems in Sustainable Development of Digital Creative Multimedia Industry

As a key area of future competition, the digital creative multimedia industry has developed rapidly in recent years, but there are also bottlenecks and problems that cannot be ignored.

1. Digital culture and multimedia technology equipment innovation support is insufficient, China's digital culture technology level and developed countries are still equipped with a certain gap. Mainly reflected in: industry scale is small, industry chain is short; Lack of core technology and weak ability of independent innovation; Poor protection of intellectual property rights. One of the most outstanding problems is the lack of core technology, which restricts the development of this field. In the field of 4K/8K technology, China is at a disadvantage in transmission and storage, codec, chip and display technology, and there are shortcoming in the key technology standard system.

Collaborative innovation is carried out in the collection, production, dissemination and display of ultra-high definition video. The reason: 1. The development of hardware system and software algorithm lags behind; 2. Lack of research on optimization and enhancement of user experience; 3 Lack of industry support for VR technology-based applications. 2. In the field of VR technology and equipment, technologies such as near-eye display, sensory interaction, rendering processing and content production need to be further developed. There is insufficient integration of hardware and software such as chips, sensors, display components and optical devices, and a lack of high-end virtual reality (VR) complete sensory interaction devices [3].

2. The overall quality of digital content innovation is low.

The domestic digital content creation in the innovation ability is insufficient, the content quality is not high, the cultural connotation is not rich enough, the boutique force is not strong, the social responsibility is not strong, must reverse this trend in time, takes the key content which needs to be solved. In software tools, the import of high-end digital content production and design software is highly dependent, which is not conducive to the independent and stable development of digital creative multimedia industry. Traditional media still have an irreplaceable position in network communication channels. In the area of copyright protection, China still has a big gap with developed countries, and more legislative efforts are needed to improve the relevant legal system. We should actively innovate in the mode of operation of intellectual property rights. Intelligent content design generation is at the forefront of digital content production, and foreign countries have been dominant in intelligent design technology, systems and platforms, which poses a major challenge to China's development in this field.

3. The overall level of sustainable and innovative design is low.

China's overall level of sustainable innovative design is not high, interdisciplinary collaboration and system integration innovation will not be strong enough, capacity is insufficient, it is difficult to support the rapid development of digital creative multimedia industry. In many fields of digital creative multimedia industry, there is a need to integrate knowledge and technology in all fields and achieve a high degree of human-machine synergy through the systematic integration and innovative

application of cutting-edge technologies such as AI, big data, cloud computing, digital sensory interaction, VR, etc. This objective has been adopted as a national strategy abroad, with remarkable results. Developed countries such as the United States, the United Kingdom and Germany have formulated or revised policies to promote scientific and technological research and development and industrialization in relevant industries. However, China is still in the initial stage in these aspects, and compared with the advanced level, there is still a large gap in the actual demand. In addition, the digital creative multimedia industry faces outstanding shortage of talents, and the cultivation of new design talents takes a certain time, which restricts the healthy development of the industry.

### **Development Direction of Digital Creative Multimedia Industry Innovation**

Looking ahead, the trends of the digital creative multimedia industry are: demand and supply, digital form and physical entity, technology and equipment, and cultural creativity. At present, however, China's digital creative multimedia industry has some problems, such as lack of scientific and technological support, lack of core technology, shortage of talents and weak innovation ability. These have limited the pace and quality of its development. This is also an important reason why China's digital culture industry is "big but not strong." Therefore, there is an urgent need to build on China's accumulated technological advantages in AI and 5G, accelerate efforts to break through and equip the digital creative multimedia industry, scientifically plan the digital creative multimedia industry innovation system, and implement key innovations in the areas of digital cultural multimedia equipment, digital cultural content, sustainable creative design and fusion penetration.

Digital culture multimedia technology equipment is the foundation of digital creative multimedia industry development, and is the key factor to ensure the sustainable and high quality of digital content supply. Artificial intelligence, big data, Internet of Things, 5G, blockchain and other universal digital technologies accelerate innovation and actively transform and reconstruct digital content production, distribution and consumption patterns. Innovations in 4K, 6K, VR, AR, holography, and naked eye 3D have opened up new horizons for the presentation and expression of digital content, as well as higher requirements and standards for digital content producers. On this basis, digital creative multimedia industry integration and development into an inevitable trend. In the future, the digital industry will form platforms, scenarios + content, and new intellectual property + technology business models. Platform-type enterprises with content creation and sharing at their core are expected to emerge as reinnovation chains and industrial chains connect. Big data and artificial intelligence companies with content creation and sharing at their core are also expected to grow, supporting the new landscape and ecology of the digital creative multimedia industry.

Sustainable and innovative design can not only solve human, machine, and artistic problems, but also more effectively absorb emerging technologies (AI, Big Data, Internet of Things, 5G, blockchain, and more), explore new business models, and promote cross-cultural intersectionality, learning, and cross-fertilization. For traditional manufacturing, being driven by sustainable and innovative design, coupled with the addition of new technologies, will drive iterations of renewal in traditional industries. Promoting



the innovation development and integration of high-tech and knowledge-intensive services. Provide new sustainable design thinking for public space design, urban and rural planning, park landscape, etc..

A number of cities in mainland China have launched “Digital Cities’ ‘pilot projects to explore the establishment of open-source service platforms, formulate indicators for the evaluation of digital entrepreneurship industries, and promote innovative mechanisms for resource integration across sectors, regions, industries and sectors. Take guangzhou, guangdong province, for example, from the government level, “internet + government services’ ‘is one of the important means to realize intelligent governance; At the enterprise level, “digital entrepreneurship” can enhance product competitiveness and market value. Guangdong took the lead in conducting the pilot work. We will promote the deep integration of digital entrepreneurship and the real economy around the open coastal areas of Guangzhou and Shenzhen, and create digital cities with international influence. [5].

**Acknowledgments.** I would like to thank my mentors Zainudin Siran and Hafizuddin Yusof for their guidance, correction and revision. Thanks to MMU for its academic platform, without which I would have been in vain, thanks again.

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