Research on the Innovation System of Artificial Intelligence in Cultural and Creative Industries

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Abstract: With the entry of artificial intelligence technology into a new era, the cultural and creative industry has also entered a stage of high-quality development. Focusing on the innovative development concept guided by market demand, it is necessary to propose a demand for cultural and creative products and services that better meet consumer experience. Based on the dynamic evolution of artificial intelligence technology development, a theoretical analysis framework for developing cultural and creative industries is constructed according to the internal logic of technological innovation and market feedback. This framework can explain the development mechanism of cultural and creative industries jointly generated by the innovation mechanism and quality cycle mechanism of artificial intelligence and consumer participation, and continue to explore the possibility of moving towards high-quality development goals from the perspective of quality changes and practical deduction of cultural and creative industry development. Developing the cultural and creative industry aims to provide consumers with cultural and creative products that meet expected standards, committed to continuously improving product quality and enhancing consumer satisfaction. To this end, measures such as strengthening quality control based on the internal circulation of product quality, constructing mechanisms for interaction and feedback between consumers and product quality perception, and establishing an evaluation system between consumers and products should be taken to achieve high-quality development of the cultural and creative industry, promote industry upgrading, and truly meet consumer needs.

1. Introduction

Today, the cultural and creative industry is flourishing at an unprecedented speed in the era of information explosion, with its core driving force being the widespread application and deep penetration of artificial intelligence technology. At the forefront of the integration of culture and technology, the cultural and creative industry not only carries the responsibility of inheriting and innovating culture but also shoulders the responsibility of promoting social progress and economic development. However, in this process, the major issue we need to face is how to build an artificial intelligence innovation system that can stimulate innovation vitality and ensure ethical norms. In the field of cultural creativity, the application of artificial intelligence is like a double-edged sword, which can bring unlimited possibilities for creation and may also trigger a series of ethical issues related to copyright, privacy, and creative rights. Therefore, exploring and establishing a scientific and reasonable artificial intelligence governance system that balances innovation and ethics is crucial for promoting the healthy and sustainable development of the cultural and creative industry [1].

This paper aims to deeply analyze the path and strategy of artificial intelligence in building an innovation system in the cultural and creative industry, and propose forward-looking and operational suggestions through case analysis and theoretical exploration to provide theoretical support and practical guidance for the intelligent transformation of China and even the global cultural and creative industry. We will discuss the issues in the following aspects: First, we will explain how artificial intelligence technology empowers the creative industry, including improving creative efficiency, enriching artistic expression forms, and exploring new market spaces. Then, we will explore the

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challenges faced in this process, particularly key issues such as data security, copyright protection, and the rights of creators. Finally, this paper proposes a framework for constructing an artificial intelligence innovation system, including the improvement of policies and regulations, the formulation of industry standards, and the optimization of talent cultivation mechanisms, to ensure the harmonious coexistence of technological innovation and humanistic care [2].

2. Artificial Intelligence and Intelligent Creativity of Cultural and Creative Industries to Achieve New Changes in Industrial Upgrading

2.1. The Intelligent Transformation of Content Production Mode

Intelligent creativity, a concept that coexists with artificial intelligence, is deeply rooted in the fertile soil of technological innovation, and its inherent logic embodies the innovative spirit and forward-looking vision of artificial intelligence. In the current digital wave sweeping the world, the cultural and creative industry is undergoing an unprecedented intelligent transformation. As the pioneer of this transformation, intelligent creativity innovates the traditional mode of content production and points out the direction for the future development of the industry. Intelligent creativity plays a crucial role in the cultural and creative industry. It uses data-driven personalized creation, big data insights into market demand, precise prediction of audience preferences, and shifts content creation from subjective intuition to objective empirical evidence, creating high-quality works that are more in line with audience tastes, significantly improving the attractiveness and dissemination effectiveness of content. Intelligent creative tools rely on natural language processing and computer vision technology to achieve automated content generation. This feature not only automatically generates press releases, script outlines, or design posters, but also serves as a companion for assisting creators, providing inspiration and suggestions, greatly improving creative efficiency and work quality. Intelligent creative tools rely on natural language processing and computer vision technology to achieve automated content generation. This feature not only automatically generates press releases, script outlines, or design posters, but also serves as a companion for assisting creators, providing inspiration and suggestions, and greatly improving creative efficiency and work quality. On the intelligent creative platform, real-time interactive functions allow consumers to directly participate in content creation, such as voting to influence the plot direction, participating in character design, etc., making the content creation process a social activity, and at the same time meeting the personalized needs of users through customized experiences.In addition, intelligent creativity strengthens copyright management and value allocation, ensures effective protection of intellectual property rights of original content, simplifies the complex process of ownership, safeguards the legitimate rights and interests of creators, and provides solid support for content creators through blockchain technology and smart contracts. In short, intelligent creativity is driving the cultural and creative industry towards a more personalized, diversified, interactive, and intelligent direction, building a brand-new creative ecosystem. However, despite the enormous potential of intelligent creativity in practice, when we attempt to define and define its essence from a theoretical perspective, we often fall into a complex situation where multiple perspectives are intertwined, making it difficult to form a consensus [3].

2.2. Artificial Intelligence, Big Data and User-Personalized Experience

2.2.1. User Behaviour Data Analysis and User Personalized Demand Forecasting

Artificial intelligence is an important standard for intelligent creativity and a technical expression of intelligent creativity. Artificial intelligence and intelligent creativity discuss the different definitions of artificial intelligence from the technological application and user experience perspective. Some scholars argue that artificial intelligence refers to the degree of innovation or technological responsibility because artificial intelligence is more innovative to some extent and belongs to intelligent technology with the purpose of technological innovation. The history of artificial intelligence can even be traced back to the early days of computer science, with its main activities including machine learning and deep learning. The concept and principles of artificial

intelligence are closely related to the innovation of intelligent creativity. Intelligent creativity has become an important responsibility of the cultural and creative industry, through artificial intelligence.[4] The theory of intelligent creativity in the digital age mainly contributes to innovative content production methods. Therefore, intelligent creativity initially focused on innovation measurement based on standard attributes of artificial intelligence. In terms of user behaviour data analysis, artificial intelligence can finely analyze massive amounts of user behaviour data through deep learning and big data mining techniques. Artificial intelligence algorithms can extract user interests, consumption habits, and potential needs through comprehensive consideration of multi-dimensional data such as user search records, click-through rates, stay times, and feedback evaluations. This precise data insight enables intelligent creative systems to identify subtle user differences, thus providing strong support for personalized recommendation systems. For personalized user demand prediction, artificial intelligence adopts prediction models and user profiling technology to predict the future preference trends of users. Intelligent systems can understand each user's unique aesthetic preferences, emotional demands, and cultural background by constructing user profiles, thus taking into account the personalized needs of users during the content creation stage. For example, in the creation of film and television works, intelligent creative systems can predict the level of interest of different user groups in specific types, styles, and themes of story content based on historical viewing data, and guide writers and directors to incorporate these elements in the script development stage, thereby improving the market adaptability and audience satisfaction of the work. The analysis of user behaviour data and prediction of personalized user needs is shown in Figure 1.

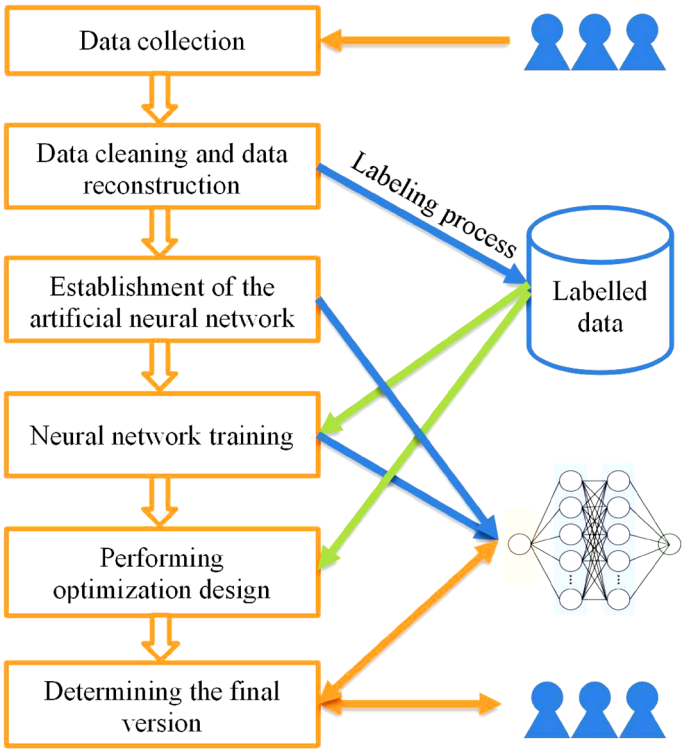

Figure 1 User behaviour data analysis and user personalized demand forecasting

2.2.2. Market Trend Insight Drives Intelligent Decision-Making

In today's data-intensive era, artificial intelligence is profoundly changing the way we make business decisions and gain market insights with an undeniable force. Market trend insight is no longer solely based on intuition and experience, but relies on the intelligent analysis of artificial intelligence to achieve the ability to extract clues from chaos and gain insights from data. The application of artificial intelligence in insight into market trends is first reflected in its powerful data processing capabilities. Artificial intelligence can quickly filter valuable information from massive amounts of data through machine learning algorithms, such as consumer behaviour patterns, changes

in market sentiment, emerging consumption hotspots, etc. These pieces of information are often hidden within seemingly disorganized data, and artificial intelligence can quickly identify patterns and patterns within them, providing decision-makers with accurate market trend analysis reports. [5].

When facing complex and ever-changing market environments, artificial intelligence can simulate different decision-making scenarios and predict the possible consequences of various strategies through deep learning. This prediction is not just a mere guesswork, but a deep analysis based on a large amount of historical data and real-time information, which can greatly reduce decision-making risks, and improve the accuracy and efficiency of decision-making. For example, in the formulation of product pricing strategies, artificial intelligence can provide companies with the best pricing advice by analyzing factors such as competitor price changes and consumer price sensitivity, ensuring that products can attract consumers while maintaining an advantage in competition.

Artificial intelligence can construct detailed user profiles by analyzing multidimensional data such as consumer purchasing history, social media behaviour, and geographic location information, thereby achieving personalized product recommendations and service customization. This highly personalized marketing strategy can improve consumer satisfaction, effectively increase conversion rates, and create greater value for the enterprise. In summary, artificial intelligence has become an indispensable tool for understanding market trends and making intelligent decisions. It can extract valuable information from data and bring unprecedented competitive advantages to enterprises through simulation decision-making, personalized marketing, and supply chain optimization. With the empowerment of artificial intelligence, enterprises can perceive market changes more sensitively, make more precise strategic choices, and seize opportunities in the digital economy era to achieve sustainable development.

3. Industrial Challenges Brought by Artificial Intelligence and Big Data

3.1. Chaos of Data: Excessive Data Collection Leads to the Imbalance of Privacy Protection System

The essence of the concept of data is related to privacy issues. Data protection is the application of privacy thinking in data governance. The data protection framework, as a new alternative model, has entered the research field to overcome the shortcomings of traditional privacy protection. The basic concept of this framework is that data collection should ensure effective implementation of user privacy, set professional standards for data usage, capture data leaks through encryption and other technologies, and use blockchain methods to measure data security. The data protection framework has restructured data security, emphasizing the need to enhance data transparency and build data security, reliability, privacy, and controllability [6].

3.2. Algorithmic Constraints: Algorithm-Led Content Homogenization Operation

3.2.1. Errors in Data-Driven Decision-Making and Deviations in Management Automation

Data is the main driving force of artificial intelligence, which emphasizes algorithm optimization and directly reflects the decision-making status of data processing and user needs through algorithms. Some constituent elements of data development are gradually taking shape, and data ethics and various evaluation systems are also receiving increasing attention. However, from a practical perspective, some data-driven decision-making practices are still in the initial stage and contradict the logical framework and generation mechanism of data governance, which leads to data security issues.

3.2.2. Algorithm Bias and Content Creation Risk

From the content creation perspective, algorithms are the fundamental link of content creation and the core embodiment of intelligent creativity. Therefore, content creation is primarily generated using algorithms as the main logic. Algorithms are the main driving force of intelligent creativity and the decision-making body of content production. At present, there are three main forms of enhancing content quality control from an algorithmic perspective for intelligent creativity: The first is algorithm

review, which clarifies the algorithm's implementation of content filtering between content production and user feedback. The second is the formulation of algorithm standards, which achieve standardized control of content creation by establishing fairness and transparency standards for algorithms, and publicly disclosing algorithm decision-making standards to users. The third is the internal process reengineering of the algorithm. In recent years, deep learning has used algorithmic methods to improve content quality and increase user satisfaction. However, compared to the ideal state, the fairness of the current algorithm still needs to be further improved [7].

3.3. The Birth of Derivative Risk Dominated by Technology

The fundamental difference between artificial intelligence and big data lies in their technological attributes. The big data standards and ethical guidelines of artificial intelligence aim at technological innovation, and the development of artificial intelligence mainly reflects technological innovation and industrial upgrading. In the innovation framework of artificial intelligence, technological innovation, industrial upgrading, data security, and user privacy are the core values and highest principles for the development of artificial intelligence. The diversity of current types of artificial intelligence and the differences in application scenarios have led to the fragmentation of intelligence. Although artificial intelligence technology is becoming increasingly mature, due to incomplete laws and regulations, and the lack of self-regulatory mechanisms, artificial intelligence has developed its shortcomings, which have affected its sustainable development. These situations inspire us to see the opportunities and face the challenges they bring in the context of artificial intelligence and big data. In particular, issues such as data security, algorithmic bias, technological runaway, creative exhaustion, and legal ethics require us to continuously improve corresponding regulations and policies while promoting technological development, ensuring the healthy development of technology and safeguarding the legitimate rights and interests of the public.

4. Countermeasures for the Development of Cultural and Creative Industries under Technical Challenges

4.1. Bidirectional Empowerment: Artificial Intelligence Gets Rid of Technical Challenges

4.1.1. Talent Skills Improvement to Achieve High-Quality Application of Technology

From the perspective of education and training, the existing education system cannot accurately provide the artificial intelligence skills required for the creative industry. The creative industry mainly evaluates the innovation ability of practitioners, but the education system lacks information and skill development mechanisms related to artificial intelligence. The essence of this problem is the disconnect between educational content and market demand. In the creative industry, talents are often regarded as "composite talents", and their mastery of artificial intelligence technology directly reflects an individual's innovation potential. However, most educational content is focused on traditional art and cultural fields, lacking information on data science, machine learning, and more. Usually, these skills are difficult to acquire or measure in school education. The information asymmetry and imperfect education system directly lead to obstacles in the application of technology in the creative industry.

4.1.2. Upgrading of Creative Industries under Technical Discipline

From the technological application perspective, the technological threshold has long constrained the innovation ability of the cultural and creative industry. Since the 21st century, intelligent platforms that integrate big data and cloud computing have reshaped the creative process through algorithms, but the drawbacks of traditional production methods still constrain industrial innovation. Due to technological costs and the impact of technological acceptance, the data-driven innovation model still needs to be improved. Under data-driven conditions, intelligent analysis is a direct way of innovation. However, the actual impact of algorithmic technologies on consumer experience remains to be discussed. Meanwhile, due to difficulties in technological implementation, innovation lacks data support. Therefore, technology-driven innovation does not seem to always achieve the expected goals.

It can be seen that technology-driven innovation is not only a technical challenge but also faces the issue of data governance [8].

4.2. Responsibility Sharing: Optimization of Risk Response Mechanism and Industry Governance

In the face of increasingly complex technological application scenarios, intelligent decision-making has become the key to improving efficiency and reducing risks. Enterprises have begun to widely adopt technologies such as machine learning and big data analysis to achieve intelligent decision-making processes. Whether it is demand forecasting in supply chain management or customer segmentation in marketing, intelligent decision-making systems can provide accurate data support to help enterprises maintain competitive advantages in the rapidly changing market environment. However, the development of intelligent technology cannot be separated from a high-level talent team. Therefore, building a comprehensive talent cultivation system is particularly important. Higher education institutions collaborate with enterprises to design courses and focus on practical teaching, aiming to cultivate versatile talents who possess both profound technical knowledge and humanistic qualities. This model of integrating industry and education has delivered a large number of excellent engineers and researchers to artificial intelligence, injecting a continuous stream of vitality into the continuous innovation of the industry.

In the vast world of artificial intelligence, no subject can stand alone. Governments, enterprises, academia, social organizations, and even every citizen are participants and builders of this complex ecosystem. The concept of shared responsibility and collaborative governance emphasizes cooperation and interaction among diverse entities to jointly address the challenges brought by technology. The government plays the role of a rule maker, ensuring the legitimacy and security of technological development through legislation, regulation, and other means. As the main force of technological innovation, enterprises should pursue economic benefits and assume social responsibility to ensure the ethical compliance of products and services. The academic community is committed to cutting-edge research, providing theoretical guidance for technological progress. The participation of social organizations and the public can examine the impact of technology from a broader perspective and promote the formation of social consensus. This comprehensive and multi-level collaborative mechanism provides a solid guarantee for the healthy development of artificial intelligence technology. This comprehensive and multi-level collaborative mechanism provides a solid guarantee for the healthy development of artificial intelligence technology [9].

4.3. Value Reversion: Correcting the Application of Technology and Restoring the Essence of Creativity

When constructing a knowledge graph, there are usually two types of relationships to start with, entity relationships and attribute relationships. Entity relationships can be directly extracted from raw data, such as the association between actors and movies. Attribute relationships require complex calculations on existing data to obtain, such as the popularity of actors, which can reveal deeper dynamics between entities. The construction process includes: constructing a single-layer knowledge graph at the film entity level, constructing a single-layer knowledge graph at the actor entity level, constructing a single-layer knowledge graph at the institutional entity level, and a multi-level knowledge graph for the entire entertainment industry. After constructing a multi-level knowledge graph, it is necessary to make correct judgments and quality evaluations on the domain entities that have joined the graph to ensure that the constructed knowledge graph has high accuracy. Compared to single-level knowledge graphs, multi-level knowledge graphs are more complex in structure, able to store more entities and have richer entity relationships. Therefore, graph neural networks can be used for validation. This technology is a deep learning model that shares variables, with smaller parameter sizes and higher application advantages compared to other models. In the application stage, this model can combine entities and relationships in the knowledge graph to complete the representation from entities to relationships. In addition, the model can score entities under the influence of the loss function, select the entity with the highest score as the accurate entity, and multiple link predictions can improve the accuracy of entity recognition, thereby verifying the high

accuracy of the constructed knowledge graph.

5. Conclusion

Artificial intelligence has permeated every aspect of the cultural and creative industry, presenting new challenges and demands for the industry. Artificial intelligence is not only a symbol of technological progressiveness and an essential tool for industrial upgrading, but also a crucial element in achieving creative personalization and safeguarding the rights and interests of consumers. It essentially reflects the internal requirements of industrial development. Under the guidance of digital transformation, artificial intelligence has established a theoretical analysis framework and practical mechanism for industrial development. In recent years, modern information technologies such as cloud computing, big data, and the Internet of Things have advanced industrial intelligence, enhancing the precision and scientific nature of creative content production and consumption experiences through artificial intelligence. Its value aligns with the inherent logic of industrial development. Therefore, based on artificial intelligence, also provides a new development path for the cultural and creative industry. In short, sustainable improvement and development of artificial intelligence can help better meet consumer needs and promote the high-quality development of the cultural and creative industry.

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