Proceedings of the 3rd International Conference on Financial Technology and Business Analysis
DOI: 10.54254/2754-1169/89/20231414

The Interactive Impact of Artificial Intelligence and Digital Economy

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Abstract: In recent years, the integration of artificial intelligence (AI) and the digital economy has become an important catalyst for social and economic transformation. Artificial intelligence, with its intelligence to mimic human thinking and learning, as well as its ability to perform complex tasks and massive calculations, is revolutionizing various industries, while reshaping the way we live and work. At the same time, the digital economy, driven by advances in information and communication technologies, is creating new prospects for growth, innovation and efficiency. This paper adopts literature analysis method, through extensive academic literature survey and review, as well as research reports in related fields, from both opportunities and challenges, uses a comprehensive literature review to study the interactive impact between artificial intelligence and digital economy, and further analyzes the risks brought by the integration of artificial intelligence and digital economy and the chain reaction caused by its wide application in reality.

Keywords: digital economy, artificial intelligence, information technology, digitization

1. Research background and significance

1.1. Concept of artificial intelligence

Artificial intelligence (AI) is a field within computer science that aims to develop intelligent machines capable of emulating human cognitive functions, including learning, reasoning, and problem-solving. AI systems excel in processing vast amounts of data, identifying patterns, and autonomously making decisions, thereby enabling them to tackle tasks that have historically relied on human intelligence. Recent advancements in machine learning, natural language processing, and computer vision have propelled the field of AI forward, leading to substantial breakthroughs in areas such as image recognition, speech recognition, autonomous driving, medical diagnosis, personalized customization, and more.

1.2. Concept of digital economy

The digital economy encompasses an economy that is propelled by digital technologies, with a particular emphasis on the Internet and digital platforms. It encompasses a broad spectrum of

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activities, including e-commerce, digital services, online advertising, and data-driven decision-making. The advent of the digital economy has disrupted conventional business models, empowering companies to access global markets, streamline operations, and provide tailored experiences to consumers. Simultaneously, the digital economy has fostered the emergence of novel business models, such as the sharing economy and platform ecosystems.

1.3. Research significance

The convergence of artificial intelligence and the digital economy is revolutionizing various aspects of our daily lives, fundamentally reshaping our lifestyles and professional endeavors. The conceptualization and advancement of artificial intelligence and the digital economy represent prominent areas of contemporary research. This article aims to offer a comprehensive comprehension of the fundamental concepts of artificial intelligence and the digital economy, as well as exploring the potential ramifications resulting from their symbiotic relationship.

2. Research status and significance

2.1. Research status

At present, the research related to the impact of the integration of artificial intelligence and digital economy is one of the hot topics concerned by the world. In the article "Factors of increasing inequality in Digital Economy and its Governance", the unemployment problem and unequal competition problem brought by artificial intelligence in the development of digital economy are discussed. The ethical risks brought by the development of artificial intelligence are discussed in Research on the Ethical Risks of Artificial Intelligence Technology. In "Digital Economy Risks of Generative Artificial Intelligence Chat GPT and Its Countermeasures", the risks and challenges of the development of generative artificial intelligence to digital economy are analyzed in detail. On the whole, the application of artificial intelligence technology in the development of digital economy is still relatively extensive, but the research on data privacy protection in the development of artificial intelligence and business model innovation in the development of digital economy lacks a systematic and logical analysis at present. The future research direction can continue to expand around these aspects [1, 2,3].

2.2. Risks and Challenges

The convergence of AI and the digital economy presents a multitude of opportunities and challenges. On one hand, the progress of AI offers new avenues for growth and innovation within the digital economy. AI technologies are utilized to enhance productivity, elevate customer experiences, and drive innovation, resulting in the rapid advancement of the digital economy. For instance, AI chatbots are employed to deliver personalized customer support, while machine learning algorithms optimize supply chain management and logistics. On the other hand, the vast data and information resources within the digital economy serve as a foundation for training and deploying artificial intelligence, propelling the continuous evolution of AI technology [4]. However, the widespread adoption of AI has raised concerns regarding privacy, security, and ethical implications. Urgent attention must be given to addressing challenges arising from AI development, including algorithmic biases, job displacement, and the concentration of power among a few tech giants, to ensure the sustained growth of a fair and inclusive digital economy.

The development of AI and the digital economy is influenced by various factors, including technological advancements, regulatory frameworks, and social acceptance, among others. Governments and policymakers play a crucial role in fostering innovation, safeguarding user privacy,

DOI: 10.54254/2754-1169/89/20231414

and establishing a supportive environment for ethical AI practices [5]. Collaboration between academia, industry, and civil society will also be pivotal in addressing challenges and maximizing the benefits of AI and the digital economy.

3. Research methods

This paper primarily employs a literature review methodology. By extensively reviewing and synthesizing a substantial body of domestic and international research materials, we have derived key insights and findings through rigorous analysis. The aim of this paper is to serve as a valuable reference for future research endeavors in this field, based on the comprehensive summary and overview presented herein.

4. Conclusion and significance

4.1. Wide Application of AI in the digital Economy

In general, artificial intelligence technology has been widely used in e-commerce, finance, science and technology, intelligent manufacturing, supply chain management and other fields.

First of all, in the field of e-commerce, artificial intelligence technology is widely used in recommendation system. By analyzing user behavior and preferences, AI can accurately recommend products or services to users that they may be interested in, improving user shopping experience and promoting the growth of enterprise sales. In addition, in terms of customer service, artificial intelligence can also provide customers with faster and convenient solutions through automated reply and voice recognition and other functions [6].

Secondly, in the financial sector, AI technology is widely used in risk assessment and fraud detection. Through big data analytics and machine learning algorithms, banks and insurance companies can more accurately assess the credit risk of borrowing applicants or policy holders and detect potential fraud in a timely manner. This not only helps improve the efficiency and security of financial institutions, but also protects consumers [7].

Moreover, in the field of technology, AI has become an integral part of many innovative projects. For example, deep learning algorithms are used for image recognition in driverless car research; Natural language processing is used to achieve accurate auxiliary diagnosis in the medical and health field. And developing personalized learning software in education. These innovations will dramatically change the way we live and work, and there is even more potential in the future.

4.2. There are various mechanisms for the impact of AI on the digital economy

The integration of artificial intelligence (AI) and the digital economy has had a profound impact on the current operating mechanisms, leading to innovation-driven AI technologies, accelerated digital transformation, and changes in business models. The application of AI in the digital economy not only revolutionizes traditional industries but also fosters the emergence of new industries and innovative enterprises.

Firstly, innovation-driven AI technologies have significantly influenced the digital economy. Through advanced techniques like deep learning, natural language processing, and computer vision, AI can analyze vast amounts of data and extract valuable insights. This enables enterprises to gain a better understanding of market demand, optimize product design, and achieve personalized recommendations and precision marketing goals [6]. Moreover, AI's ability to make autonomous decisions and self-learn enhances efficiency, reduces costs, and minimizes error rates in the production process.

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Secondly, accelerating digital transformation is another crucial mechanism influenced by AI. The combination of internet technology and AI has become a trend for traditional industries to embrace digitization. For instance, in the retail sector, e-commerce platforms utilize AI to analyze user profiles, predict consumer purchasing intentions, and optimize supply chain management. In the financial field, blockchain-based risk control models, virtual assistants, and trust systems are widely employed.

Lastly, AI plays a pivotal role in driving changes in business models. It has given rise to models such as the sharing economy and online education platforms, spawning numerous new companies. Additionally, the introduction of unmanned vehicles or drones in logistics and distribution greatly enhances efficiency. In the healthcare field, AI diagnostic systems can be utilized for early disease detection and treatment planning.

Overall, the integration of AI and the digital economy has revolutionized operating mechanisms, driving innovation, digital transformation, and changes in business models across various industries.

Given the aforementioned situation, the following suggestions can be considered for future development:

(1)Enhance policy support: Government departments should actively develop and implement laws and regulations to govern the application of AI in the digital economy. Encouraging research institutes to collaborate and exchange knowledge with enterprises and public institutions is also crucial.

(2)Improve professional skills: Recognizing the impact of AI on the job market, education departments should adapt their content and methodologies to enhance students' knowledge and skills, ensuring they are well-prepared for the evolving workplace demands of the future.

(3)Ensure data security: As the era of big data unfolds, the prominence of data security issues becomes increasingly evident. Strengthening network security protection measures and refining relevant laws and regulations are essential for safeguarding data integrity and privacy.

(4)Foster international cooperation: Multinational companies should prioritize strengthening cooperation, promoting knowledge exchange, and sharing best practices. By working together, they can collectively advance the development of AI in the digital economy on a global scale.

By implementing these suggestions, we can navigate the challenges and opportunities presented by AI in the digital economy, fostering its responsible and sustainable growth.

4.3. The convergence of artificial intelligence and the digital economy gives rise to new risks

According to the current research status, the integration of artificial intelligence and digital economy has brought many new risks and challenges while developing rapidly. Problems such as labor shortage, ethical issues in artificial intelligence, and imperfect social basic measures need to be solved urgently. Of course, people are most concerned about data privacy and security. As a large amount of personal information is collected and stored on cloud servers, data leakage or abuse may lead to serious consequences. Therefore, it is particularly important to strengthen data protection measures and encryption control authority management.

We can take the following measures to solve the problem of labor shortage. First of all, the government should increase investment in the field of education to improve the quality and level of education. By optimizing the education system and curriculum, we will train more professionals with relevant skills and knowledge background. Second, strengthen support for vocational training and encourage enterprises to develop internal training programs to upgrade the skills of employees. In addition, flexible employment systems can be introduced to alleviate the imbalance between labor supply and demand to some extent.

As for the ethics of artificial intelligence, we need to establish and improve corresponding laws and regulations and strengthen supervision mechanisms. This includes ensuring data privacy security, preventing the misuse of personal information, and clarifying the boundaries of power and responsibility. At the same time, it is necessary to promote the public to have a correct and in-depth

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understanding of artificial intelligence technology, and guide social opinion to form a positive voice [2].

As for the problem of imperfect social basic measures, the government needs to take the lead and participate in the solution with all stakeholders. The government should increase the investment in social welfare and improve the existing welfare system to meet the new needs brought by the changes in the digital economy era. In addition, in the process of promoting the development of digital economy, we should pay attention to the principle of fairness and provide special protection measures for vulnerable groups [8].

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4.4. Artificial intelligence and digital economy drive each other

The rapid development of digital economy provides huge data and market demand for the application of artificial intelligence technology, and the progress of artificial intelligence further promotes the vigorous development of digital economy. A virtuous cycle of interaction is formed between the two.

First of all, as an emerging field, digital economy has made great progress in information technology, communication network and e-commerce. With the rapid development of mobile Internet, Internet of Things and big data technology, massive data is constantly generated and stored. This data becomes a necessary resource for AI algorithms to train and optimize models. At the same time, the digital economy also creates rich and diverse market demands, prompting enterprises to increase investment in the research and application of artificial intelligence technology [9].

Secondly, artificial intelligence has made breakthroughs in various fields, such as finance, medical care and transportation. Through machine learning, deep learning and other technical means, artificial intelligence can mine valuable information from complex data, and make predictive analysis and decisions! Support. This efficiency and accuracy leads to better user experience and service quality, which plays an important role in driving the growth of the digital economy.

However, there are still some problems to be solved in the process of driving each other. The first is the issue of privacy protection. When obtaining large-scale user data, we need to pay attention to legal and compliant use and take effective measures to protect users' privacy rights and interests. The second is the problem of security risk. How to prevent malicious attack or abuse of AI technology from causing harm to society is an important topic. In addition, it is also necessary to pay attention to fairness and avoid discrimination in the design and implementation of AI algorithms [10].

In view of the above problems, we can put forward the following suggestions: first, strengthen relevant legislation and supervision mechanism, and clarify the boundary of personal information collection and use authority; Secondly, investment to strengthen the construction of network security infrastructure, promote the further development of technology; In addition, open sharing of AI algorithms and related intellectual property rights will be encouraged to promote a level playing field.

5. Conclusion

This paper examines the interaction between artificial intelligence and the digital economy through a comprehensive literature review, unveiling the extensive application of artificial intelligence technology in driving the development of the digital economy. Moving forward, it is imperative to further deepen this interaction and propose viable solutions to address current developmental

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challenges, which will undoubtedly present both opportunities and challenges for economic and social progress.

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