



A Research on Development Strategy of China's Digital Economy in the Post-COVID-19 Era

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Abstract: The COVID-19 epidemic outbreak in 2020 was a worldwide pandemic that continues to rage across the globe today. It has brought serious negative impact on the global economy and society, and caused a severe global economic recession. China's government has always paid a great attention to digital economy development, especially during this epidemic, which has played a supporting role in the epidemic prevention and control and economic recovery. The Fourteenth Five-Year Plan and many policy documents emphasize to accelerate digital economy development. However, due to a late start and weak foundation, China is faced with problems such as imperfect systems and regulations related to the digital economy, severe digital security challenges, imbalanced and inadequate infrastructure construction of information and communication, lack of core technology innovation, and scarcity of professional talents. This paper puts forward relevant countermeasures and suggestions for the existing problems through analysis.

Keywords: digital economy, COVID-19, new infrastructure

1. Introduction

Currently, the world has entered the Age of Information Revolution from Industrial Revolution. Data has become a new production factor and plays an important role in social and economic development. The full use of data value has promoted the transformation and upgrading of digital industrialization and industrial digitization, which has also boost economic and social development. In 2020, the widespread COVID-19 epidemic led to a significant recession of world economy, blocked the circulation of the global industrial and supply chain, rolled financial market, and seriously shrank international investment and trade. However, in the face of outbreak, digital economy has shown its vitality and become a key factor for hedging impact of the epidemic and reshaping economic system. During this period, emerging digital industries such as e-commerce, online education, contactless delivery, online office, telemedicine, online consumption, and intelligent manufacturing showed huge growth and market potential.

Digital Economy can be traced back to 1995. The American economist Don Tapscott first explained in his book "The Digital Economy" that the digital economy is a new economic model based on the network of human intelligence^[1]. Since then, various countries have carried out extensive research on the digital economy. According to the "G20 Digital Economy Development and Cooperation Initiative" issued by the G20 Hangzhou Summit in 2016, the digital economy refers to "a broad range of economic activities that include using digitized information and knowledge as the key factor of production, modern information networks as an important activity space, and the effective use of information and communication technology (ICT) as an important driver of productivity growth and economic structural optimization^[2]."

The Chinese government has always attached great importance to the development of digital economy. The Fourteenth Five-Year Plan is the direction of China's economic and social development in the next five years. It clearly states that "To embrace the digital age, it is necessary to activate the potential of data elements, build China into a cyber power and accelerate the construction of digital economy, digital society, and digital government. Digital transformation is used to drive changes in mode of production, life and governance^[3]."

Therefore, it is necessary to analyze the current status and the problems of development of China's digital economy, and summarize countermeasures to promote it development in COVID-19 epidemic.

2. The current statues of China's digital economy development

2.1 The overall size of China's digital economy

According to statistics from the "White Paper on China's Digital Economy Development (2021)" released by the China Academy of Information and Communications Technology in April 2021, the scale of China's digital economy have reached 39.2 trillion yuan in 2020, an increase of 3.3 trillion yuan from 2019, accounting for 38.6% of GDP , An increase

of 2.4 percentage points year-on-year. In terms of growth, the growth rate of the digital economy reached 9.7%, more than 3.2 times the nominal GDP growth rate in the same period. The digital economy become a key driver for the sustained and steady growth of the national economy^[4].

However, in the same period, the digital economy of Germany, the United States, the United Kingdom, and South Korea respectively accounted for 66.7%, 66%, 65%, and 52% of their GDP^[5]. Although China's digital economy is growing fast, it still needs to accelerate its development and increase the proportion of digital economy in the national economy.

2.2 The internal structure of China's digital economy

Digital Industrialization: In 2020, the scale of China's digital industrialization reached 7.5 trillion yuan, accounting for 19.1% of the digital economy and 7.3% of GDP.

Industrial digitization: In 2020, the scale of China's industrial digitization reached 31.7 trillion yuan, accounting for 80.9% of the digital economy and 31.2% of GDP.

The digitalization of three industries: In 2020, the digital economy of China's service industry, industry and agriculture accounted for 40.7%, 21.0% and 8.9% of the industry added value respectively^[4].

2.3 Digital infrastructure

According to the "The 48th Statistical Report on China's Internet Development" released by China Internet Network Information Center (CNNIC), as of June 2021, the number of Chinese Internet users has reached 1011 million, an increase of 21.75 million from December 2020. and the Internet penetration rate reached 71.6 percent. In addition, the number of mobile Internet users has reached 1007 million, an increase of 20.92 million from December 2020. The proportion of Internet users using mobile phones to access the Internet was 99.6%.

By June 2021, the amount of domain names in China was 31.36 million, of which 15.09 million were “.cn “domain names, accounting for 48.1% of the sum of domain names in China. The number of IPv4 addresses in China is 393.19 million, the number of IPv6 addresses is 62023 blocks/32, and the number of active IPv6 users reaches 533 million. The number of Broadband Internet access ports reached 982 million, a net increase of 35.63 million compared to December 2020. Among them, optical fiber access (FTTH/O5) ports reached 918 million. The total length of optical cable lines in China reached 53.52 million kilometers, a net increase of 1.83 million kilometers compared with December 2020.

In terms of mobile networks, the sum of mobile phone base stations is 9.48 million, of which the sum of 4G base stations is 5.84 million, accounting for 61.6%^[6].

3. The problems in development of China's digital economy

3.1 Systems and regulations related to the digital economy are not perfect

In order to promote the rapid development of digital economy, China's government has always provided a relatively loose development environment, but at this stage of development, the imperfect systems and regulations have also brought obstacles to further develop digital economy. First of all, China's government and enterprises blur the boundaries of powers and responsibilities, and the responsibilities of data security is as clear as mud, the scope of data supervision isn't crystal clear, resulting in a lack of trust and unsmooth data sharing between them, which greatly restricts the service efficiency, coordinated management level and emergency response ability of government departments to deal with emergencies^[7]. Secondly, domestic legislation of personal data protection is scattered, and there is no unified personal information protection law and data security law have been formulated. The issue of data property rights is still inconclusive, and the data security supervision system has not yet been established. In addition, the data assetization system is far from being established and still in its infancy. It lacks a reasonable and unified effective pricing method of data assets and corresponding transaction specifications. Market failures are prone to occur in the transaction process, which hinders the optimal allocation of data resource. Fourthly, various data collected by different departments cannot be integrated in a timely and effective manner, and the mechanism for efficient decision-making based on big data has not yet been formed.

3.2 The security of digital economy needs to be strengthened

Compared with western developed countries, China lags behind in the overall development of digital technology and faces severe security challenges. The security of digital economy has three characteristics: one is that cyber-attacks are not restricted by space; second, it is difficult to trace the source; third, digital technology updates with each passing day, and the development of security measures to deal with it is lagging and passive^[8]. The wide application of emerging information technologies, such as cloud computing, Internet of Things, and 5G, has further improved the associative aggregation of data, connecting functions in the fields of finance, energy, electricity, transportation, water conservancy and other fields

into a whole system. However, it also makes the boundaries of traditional network security are broken, the potential risks and impact range by cyber-attacks have increased, and the protection of privacy disclosure and data abuse has become more difficult^[9]. According to the “China Internet Cyber Security Report (2020)” issued by National Computer Network Emergency Response Technical Team/Coordination Center of China, in 2020, the number of security vulnerabilities included in the China National Vulnerability Database (CNVD) is 20,704, which continues to show an upward trend, with a year-on-year increase of 27.9% and an average annual growth rate of 17.6% since 2016^[10]. In addition, more than 3,000 important data security incidents such as theft and illegal sale of personal information were monitored and reported in 2020, involving many industrial institutions such as e-commerce, Internet companies, medical and health care and off-campus training.

3.3 The construction of information and communication infrastructure is unbalanced and inadequate

On the one hand, the construction of information and communication infrastructure is unbalanced, and there is a wide gap between the eastern and western regions, and between urban and rural areas, which various digital resources cannot be shared equally. According to the “The 48th Statistical Report on China's Internet Development”, the Internet penetration rate in urban areas was 78.3%, and that in rural areas was 59.2% in China by June 2021. Moreover, it can be seen more intuitively through this epidemic that the digital economy has a sound foundation in the eastern coastal cities with developed economy, but the central and western cities with underdeveloped economy are limited by technology and capital, and the construction of digital hardware is seriously inadequate. On the other hand, the traditional information and communication infrastructures, such as high-speed broadband networks, are relatively old and need to be further upgraded at a faster pace. At meanwhile, new infrastructure, such as 5G base stations, big data centers and the industrial Internet, is inadequate and needs to be further improved the overall layout^[7].

3.4 Core technology innovation capacity is insufficient

Firstly, at the present stage, the rapid development of China's digital economy is mainly concentrated on the application side, and the digital core technology is still lagging behind compared with developed countries. At present, the top five global manufacturers on photoresist industry take 87% of the market share, including four Japanese enterprises and one American enterprise, which means the US and Japan basically form a monopoly, Chinese photoresist can only survive in the cracks.

Secondly, there is insufficient investment in basic theoretical research in related fields, lack of independent and innovative core technologies, and a high degree of foreign-trade dependence on key equipment. During the epidemic, trade disputes between China and the United States caused the US to block digital core technologies, which severely affected the development of relevant enterprises in China's industrial chain.

Thirdly, limited by the evaluation system and incentive mechanism, the connection channels on industry-academia-research are not smooth, resulting in insufficient motivation and low conversion rate for the transformation of scientific and technological achievements.

3.5 Talent is scarce in the digital economy

The digital economy integrates many industrial fields and emerging technologies, and has a high demand for comprehensive and professional composite talent. China's digital economy started late, and the speed of cultivating digital talent by universities, enterprises and research institutes is far less than that required for the development of the digital economy^[11]. Especially in the research and development of some key industries and core technologies and products, the problem of serious shortage of talent supply is more prominent, which greatly restricts the development and utilization of digital technology resources in China, resulting in weak basic innovation capacity and restricting the further development of digital economy. In addition, at present, the government and enterprises have not established an incentive mechanism of digital talent, and cannot attract high-end talent.

4. Countermeasures and suggestions

4.1 Improve relevant systems and regulations

Promoting the sustainable development of the digital economy requires sound systems, regulations and supervisory mechanism. First, we should draw on the experience of digital economy legislation in developed countries, establish and improve laws and regulations on data property rights systems, data protection systems, and data security review systems in terms of network security and personal information protection, and clarify data ownership, responsibilities and obligations of relevant subjects^[9]. Second, we should improve the legal mechanism for data opening and sharing, accelerate the construction of a national government data open platform, unify the standards, and promote the data opening and sharing

between government and enterprises. Third, we should build a data assetization system, establish data transaction laws and regulations and industry standards, construct a market-oriented data transaction mechanism, explore a unified and efficient data pricing method, and further optimize the efficiency and fairness of resource allocation. Fourth, we should optimize the decision-making mechanism for big data applications so that the data collected by multiple departments can be timely and effectively integrated and applied to all aspects of economic life.

4.2 Strengthen the construction of digital security protection system

In the digital economy era, digital security can guarantee development. First, we should speed up the construction of a comprehensive security protection system, focusing on the breakthroughs in key security technologies such as safety monitoring, safety precaution, safety protection and vulnerability scanning and mining. Second, we should accelerate to form a safety standard system, especially in key industries, new infrastructure and other application scenarios to define and clarify data protection standards, and standardize security protection requirements. Third, we should build a scientific data security supervision platform, comprehensively realize the full-cycle data monitoring and real-time precaution, and minimize the security risks. Fourth, we should train the compliance personnel for data security, and carry out universal education on network security in the whole society, to promote social users jointly raise their security awareness.

4.3 Strengthen the construction of digital infrastructure

First, the government should strengthen the top-level design, accelerate the formulation of strategic plans for new infrastructure, make overall plans for the industry and regional layout, and vigorously promote the construction of information infrastructure, 4G and the popularization of all-optical networks in the western and rural areas. At the meantime, it cannot stop advancing further development of digital infrastructure in the east and urban areas. Second, it should accelerate networked construction and digital transformation of traditional infrastructure. Third, we should accelerate the development of new infrastructure, such as 5G base stations, big data centers and the industrial Internet, to lay a solid foundation for development of digital economy. Fourth, we should give full play to the guiding role of fiscal, taxation and financial policies, build a diversified investment and financing system, and fully arouse the enthusiasm of various market entities^[7].

4.4 accelerate breakthroughs in core key technologies

The core of digital economy development lies in mastering core technology. First, it should increase Research input cost, strengthen basic theoretical research and introduce relevant policies and measures to enhance the incentive intensity, so as to open up the achievements transformation channels of industry-academia-research. Second, we should make breakthroughs in core technologies such as high-end chips, artificial intelligence and operating systems, to improve the core competitiveness of digital economy development, and establish a sustainable technological innovation system for digital industry. Third, we should cultivate more platforms with international influence, give full play to the leading role of platforms in technological innovation, accelerate integration of high-quality innovation resources, and inject strong impetus into the innovation of digital economy.

4.5 Strengthen support of digital talent team

A talent team with high level, excellent quality and reasonable structure is the core support to promote digital economy development. First, we should strengthen educational reforms, guide universities to explore the layout of emerging majors and interdisciplinary disciplines in digital field, and strengthen training of compound professional talents. Second, in order to cultivate craftsmen of the nation in digital field, higher vocational colleges should strengthen the training of applied and practical talents. Third, we should remove institutional barriers to talent flow, improve incentive mechanisms, such as personnel system, salary system and evaluation system to increase the attraction and flow of talents. Fourth, we should attract high-end talents from all over the world, build a platform for gathering top talents around the world, and actively introduce relevant policies to strengthen talent service guarantee^[12].

5. Conclusion

From the above analysis, it can be seen that although China's digital economy has developed rapidly in recent years, which the total scale has reached the second largest in the world and the growth rate is far exceeding that of developed countries, but there are still many problems need to be solved urgently in institutional and legal construction, technological innovation and some other aspects. This paper hopes to promote China's digital economy development, optimize the allocation of resources, and find new growth points for economic development through the study of targeted development strategies.

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