



The Impact of the Covid-19 pandemic on Guangzhou's Digital Economy

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Abstract. COVID-19 epidemic has caused tremendous influence to the world economy. as a major driver of economic growth, the digital economy has also been affected. Guangzhou is a central economic city in southern China, and the development of digital economy is relatively mature. This paper adopts the methods of literature analysis, case analysis, questionnaire survey and other research methods to analyze the impact of the epidemic on various fields of digital economy in Guangzhou, sort out the measures and effects of digital economy in response to the epidemic, and obtain the opinions and suggestions of digital economy practitioners through questionnaire survey. Based on the above analysis, this study believes the COVID-19 outbreak has brought some influence to Guangzhou's digitized economic growth, however, it is very resilient and able to cope with it. Digital economy will remain a major impetus for the growth of Guangzhou's economy. In order to do so, we should enhance the building of digital infrastructure and enhance innovative capacity so as to push forward the integration of the digital economy with the real economy.

Keywords: Guangzhou City, digital economy, COVID-19 pandemic.

1 Introduction

1.1 Background and Significance of the Study

The development of digital economy in Guangzhou began at the end of the last century, with the rapid development of information technology and the continuous increase of government investment, the digital economy began to enter a period of rapid growth. before 2008, Guangzhou's digital economy was mainly based on information services, e-commerce and digital games, and the growth of its industrial scale and output value was relatively slow. With the Guangdong Provincial Government's release of the Action Plan for the Innovative Development of the Digital Economy in Guangdong Province (2016-2020), Guangzhou has quickly followed suit and become one of the key support points for the digital economy in Guangdong Province.

In recent years, Guangzhou has excelled in innovation and investment in the digital economy. The government has continued to increase investment in the digital econo-

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my, promoting the development of information infrastructure construction, digital technology research and application, and talent training. At the same time, Guangzhou also actively participates in global digital economy competition and accelerates international exchanges and cooperation among digital economy enterprises. The introduction of this series of policies and measures has promoted the development of digital economy in Guangzhou, and the industrial structure and development quality have been further improved.

At present, the digital economy industry in Guangzhou has become one of the important pillar industries in Guangzhou. According to the 2023 Guangzhou Economic and Social Development Statistics Bulletin, the total output value of the digital economy in Guangzhou reached 925.5 billion yuan, a year-on-year increase of 19.3%. At present, e-commerce, mobile payment, big data and artificial intelligence in Guangzhou's digital economy industry are all developing rapidly.

Taking e-commerce in the digital economy industry as an example, the e-commerce turnover in Guangzhou reached 135.2 billion yuan in 2023, a year-on-year increase of 13.4%, making it an important part of the city's digital economy industry. The Internet Economy Index of Guangzhou City ranks firmly in the top five nationally, and its overall competitiveness is ahead of other first-tier cities in China.

To summarize, after decades of development and policy guidance, The digital economic development in Guangzhou has stepped into a fast developing phase, and the present situation is excellent. In the next step, Guangzhou will continue to devote itself to digital economy innovation and accelerate the improvement of industrial level and competitiveness.

1.2 Literature Review

Domestic Research Status. The rise of the digital economy, propelled by the third Internet-based technological revolution, has been transformative, leading it to be known as the information economy. Digitization, brought on by advancements in information technology, has altered economic and societal landscapes [1]. The emergence of digital technologies, platforms, and infrastructures has significantly impacted employment patterns, value creation, and capture, as highlighted by Nambisan and colleagues [2].

Regional analyses have revealed that enhanced tertiary education outcomes and an augmented number of patents can notably bolster digital economic growth [3]. Effective digital infrastructure is seen as crucial for middle-income nations to bridge developmental gaps and elevate their global competitiveness. The digital economy not only fosters sustainable progress but also expedites regional integration [4]. Nevertheless, it has been argued that advances in the digital economy, while beneficial, have also led to a decline in productivity in industrialized countries, and therefore GDP has limitations when measuring digital economic development [5]. Domestically, the digital economy's evolution and its formative mechanisms are prime areas of focus. It is viewed as a pivotal force in the transition between old and new kinetic energies, exhibiting disruptive innovation, platform economics, and novel ecological competitions such as the "winner takes all" and "dandelion effect"[6]. Comprehensive indices

have been established to gauge the digital economy's growth, revealing a slowdown in China's digital economy expansion, albeit with significant driving effects on overall economic growth [7]. Studies also underline the intertwined relationship between the digital economy, digital trade, and financial inclusion [8]. The role of the network revolution in bolstering China's economic expansion has been empirically examined [9]. Both micro and macro perspectives shed light on how new technologies enhance economies of scale, scope, and the long-tail economy, elevating the economic equilibrium level [10]. Spatial analyses unveil notable regional disparities in China's digital economy development, with a decreasing gradient from east to west and synergistic yet differentiated characteristics [11]. Additionally, new infrastructure and innovation quality positively influence digital economy development, exhibiting spillover effects [12].

Literature Review. Existing literature has made significant contributions to various fields of study. They provide valuable insights, theories, and methodologies that enhance our understanding of different topics. These contributions serve as a foundation for further research, facilitating advancements in knowledge and scientific progress.

1.3 Status of the Epidemic at Home and Abroad

As shown in Figure 1, the National Bureau of Statistics (NBS) calculated the domestic GDP and its growth rate in the three years before and after the outbreak of the Xinguanqun epidemic: in the first three years of the outbreak, China's GDP was growing at a rapid rate of more than 7%. However, at the time of the outbreak in early 2020, the year-on-year growth rate of China's GDP in that year was only 2.21%, less than 1/3 of that of the previous year. In the second half of 2020, under the national government's response, economic development gradually returned to the normal track, and in 2021, domestic demand was steadily recovering, with its potential being continuously released, and the total retail sales of consumer goods exceeded 44 trillion yuan, a new record, with a 12.5% growth rate compared with that of 2020 by 12.5%, effectively playing the role of consumption as the first engine. Meanwhile, fixed asset investment recovered steadily, the investment structure continued to improve, and the growth rate of manufacturing investment reached 13.5%. Rapid growth in foreign trade, the total import and export of goods for the year reached 39.1 trillion yuan, an increase of 21.4% over the previous year, the growth rate was a new high in the past decade, in economic growth, stabilizing employment, etc., played an important role. In 2022, however, China's economy was significantly impacted by the epidemic, with most areas under closure and control, traffic and logistics blocked, and transportation declined; most factories shut down and companies closed; restaurants banned dine-ins, entertainment venues banned, etc., which seriously hampered the economy's development.

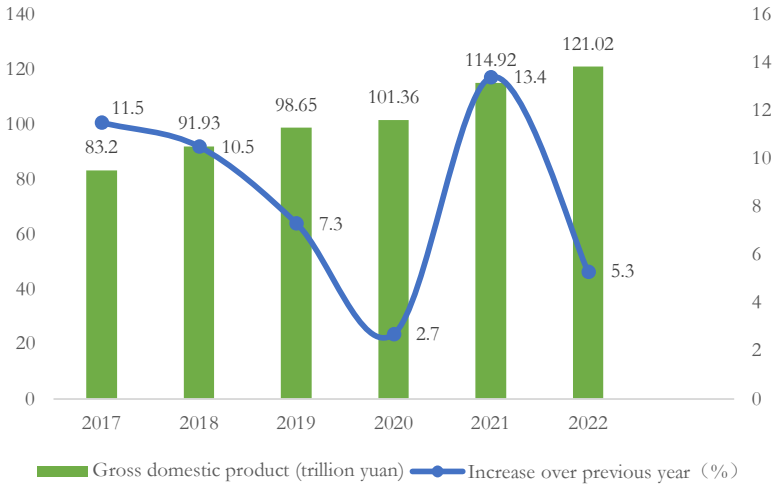


Fig. 1. GDP and its growth rate, 2017-2022

Data source: World Bank

Photo credit: Original

The impact of the Covid-19 pandemic on domestic economic development has been complex, but in general it has put some downward pressure on the domestic economy.

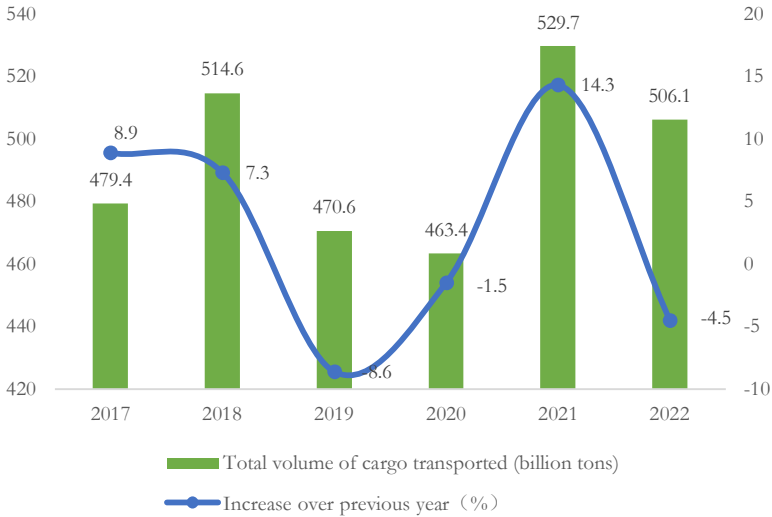


Fig. 2. China's Total Transportation and Its Growth Rate, 2017-2022

Data source: World Bank

Photo credit: Original

On the one hand, the Covid-19 pandemic has led to disruptions in both demand and supply, which have created a short-term shock to the domestic economy. In particular, for sectors such as consumption and services (please see Figures 2 and 3), the stagnation on the demand side led to lower revenues and increased pressure on cash flows.

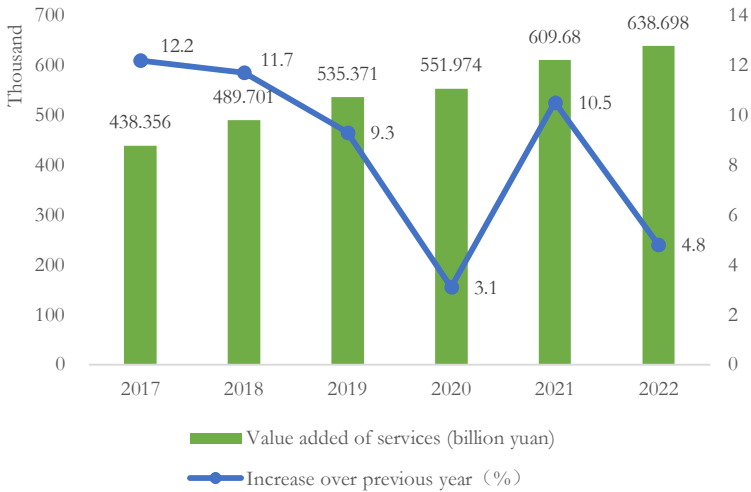


Fig. 3. Value Added of China's Service Industry and Its Growth Rate, 2017-2022

Data source: World Bank

Photo credit: Original

On the other hand, the Covid-19 pandemic has also promoted domestic industrial upgrading and restructuring, bringing new growth opportunities to the domestic economy. For example, investment and research and development activities in medical, science and technology, and health have increased, thus promoting high-quality economic development.

In addition, the Covid-19 pandemic also had a short-term impact on the domestic financial market, but with the optimization of epidemic prevention and control measures and the advancement of economic recovery, the financial market gradually returned to normal operation.

Generally speaking, the effects of the COVID-19 pandemic on the national economy are complicated and varied, and many factors and challenges need to be taken into account in order to identify the best possible development strategy. In particular, the effects of COVID-19 on the national economy are as follows: (1) Demand, (2) Supply, (3) Investing and Financial Markets, (4) Corporate Indebtedness Risk.

1.4 Research Content

This article aims at researching the influence of COVID-19 on Guangzhou City's digitized economic growth and how to deal with it. Firstly, this article gives a brief

introduction to Guangzhou City's digitized economic development. Secondly, it analyses the influence of Xin Guan Plague on Guangzhou's digitized economy, including the impact of the epidemic on the industrial chain of the digital economy, business operations and consumer habits. Then, it discusses the response measures of digital economy in the epidemic, including strengthening digital transformation, promoting digital industry innovation, and actively participating in digital joint prevention and control. Finally, it elaborates on the implications of the epidemic for the future development of the digital economy in Guangzhou, including the need for the digital economy to pay more attention to responding to changes in the general environment, accelerating the pace of digital transformation, and actively responding to risk challenges. The innovation lies in the in-depth discussion of the impact of the Covid-19 pandemic on the digital economy and the measures of the digital economy to cope with the epidemic, which will provide an experience reference for the digital economy of Guangzhou to cope with similar epidemics in the future.

2 Implications of the Covid-19 pandemic for the Development of the Digital Economy in Guangzhou City

2.1 The New Role of Digital Economy in the Epidemic

The digital economy has played a very important role in the epidemic. First of all, with the outbreak and spread of the epidemic, the Guangzhou Municipal Government has taken a series of preventive and control measures, one of which is to carry out online office and promote remote office mode. The digital office model can not only effectively realize the flow of office information, but also greatly reduce the risk of infection caused by the gathering of people. During the epidemic, many enterprises have also adopted online marketing and online education to ensure the normal operation of their business.

Secondly, digitized medical services have also greatly improved the efficiency of epidemic response. Internet companies such as Baibuyun went online with online consultation services, and the platform also donated more than 2,000 copies of anti-epidemic supplies to 5,000 healthcare workers, which effectively alleviated the shortage of protective supplies such as masks. Digital healthcare services also enable the sharing and distribution of medical resources, improving the accuracy and efficiency of medical work and playing an important role in epidemic prevention and control.

The digital economy will continue to play a unique role in future development, especially in the service sector. Data-driven and intelligent services will become an important development direction of the digital economy. For example, market demand can be predicted through big data analysis to provide more accurate services; cloud computing, artificial intelligence and other technologies can also be used to achieve intelligent management of production and distribution, leading to the high-quality development of the digital economy.

To sum up, it indicates that the digital economy plays an increasingly important role in modern society. For Guangzhou City, it will be helpful for Guangzhou City to

enhance its international competitiveness, enhance its cooperation with other companies involved in digital economics, and push forward the speed of digital growth.

2.2 The Impact of the Epidemic on the Digital Economy Market

The epidemic has had a great impact on the digital economy market, affecting the market economic conditions in many ways. First, the market supply was limited as many businesses closed or downsized due to the epidemic. Secondly, the epidemic has driven the process of digital transformation, which has resulted in a large number of businesses shifting more of their market demand to digital platforms, which have seen a significant increase in their frequency of use. In addition, as online sales grew, sales in offline brick-and-mortar stores declined. As a result, many digital economy businesses saw a great deal of growth during the epidemic, and the decline in offline economic activity contributed to the plight of many traditional brick-and-mortar businesses.

Despite its rapid growth during the epidemic, the digital economy was also negatively impacted by the epidemic. For example, The digital economy depends on developing logistic and manufacturing industries, which have also suffered a great deal from the crisis, resulting in a number of challenges in the functioning of the digital economic market. Moreover, the digital economic enterprises are also confronted with unstable market requirements, supply chain problems, employee cap issues, and marketing challenges.

In order to stabilize the development of the digital economy market, the government has also introduced relevant policies. For example, it facilitates digital economy enterprises by providing some preferential policies and reducing administrative approvals; it encourages enterprises to accelerate digital transformation in order to stabilize the digital economy market; Meanwhile, the government has also been active in directing the traditional business transition towards digital, so as to keep the brand stable and develop.

All in all, the epidemic has had a huge impact on the digital economy market in Guangzhou. People need to pay attention to the impact of the epidemic on the digital economy market, adjust and upgrade the digital economy market in a timely manner through corresponding policies and measures to cope with the challenges posed by the epidemic, and provide better protection for the robust and sustainable development of the digital economy market!

Digitized economy is a key component in modern economic system. It is necessary for it to be able to develop continuously with the help of policies. The New Crown Epidemic, however, has caused many problems and challenges for the world's economic development.

In Guangzhou City, the impact of the epidemic on digital economy policies is more obvious. Affected by the epidemic, some digital economy enterprises have been constrained and hit by various aspects such as capital and personnel, especially those startups. At the same time, the shortage of talent in the emerging industries of the digital economy also makes enterprises face greater challenges, and policy support is particularly important.

To help digital economy enterprises cope with the impact of the epidemic, Guangzhou has adopted a series of policy measures, such as strengthening financial support and optimizing the business environment. Among them, the most significant policy initiative is the introduction of the Guangzhou Digital Economy Action Plan (2020-2022), Which fully supports the development of the digital economy. It puts forward "Five One" measures, that is, building, upgrading, intellectualization, digitalization and intelligent urban development, so as to make a profound connection between the digital economy and the traditional economic system. Furthermore, it proposes "Two New Technologies and One Critical Concepts": Constructing a Digital Economy Based on Digital Economy; Establishing a New Industrial Ecological Environment; Constructing Digital Industry Cluster.

Although the pandemic has affected the digital economy, the local authorities have increased their support to the digital economic sector, particularly in its policy direction, from "large overall" to "high-quality, effective and intense". This will help the digital economic companies to get over the difficult situation caused by the plague, and make it more useful for social and economic development.

In conclusion, in order to promote the digital economy in this period, Guangzhou has taken a number of policies to promote the development of the digital economy.

2.3 Measures for Digital Economy Development in Response to the New Crown Epidemic

Measures for Digital Economy Enterprises to Cope with the Epidemic. Affected by the new epidemic of SARS, the digital economic companies have adopted all kinds of countermeasures in response to the epidemic. First, they strengthened health protection, carried out disinfection work, and reduced crowded people gathering to avoid the spread of the epidemic. Secondly, they strengthened employee health management to ensure that employees were healthy, and adopted decentralized offices and home offices to reduce the risk of cross-infection. In addition, digital economy enterprises also actively expand business channels, develop online sales, telecommuting and other businesses to reduce personnel mobility and reduce the risk of infection. In addition, enterprises have strengthened psychological guidance and reassurance for employees, paying attention to their physical and mental health to ensure stable operation. Recently, some enterprises have also tried to use digital technology and big data analysis tools to analyze the impact of the epidemic on their business, and take targeted countermeasures according to the actual situation, which effectively protects their business development.

The response measures of digital economy enterprises not only strongly control the spread of the epidemic, but also provide new ideas for the development of enterprises. In addition to effectively controlling the epidemic, enterprises can also improve their resistance to the epidemic through digital transformation. Enterprises can use digital technology and big data analytics to analyze the impact of the epidemic on their business and develop corresponding countermeasures. Digital technology can help enterprises realize online business operations and remote services to customers, reduce personnel mobility and lower the risk of infection. At the same time, digital economy

enterprises can also increase their investment in public health and wellness, develop more innovative products and services, and provide smarter and more efficient solutions for health management.

In conclusion, digital economy enterprises have taken a variety of countermeasures in the face of the challenges of the new crown epidemic, achieving positive results and facilitating the digital transformation of enterprises. In fighting the epidemic, digital economy enterprises have demonstrated a relatively strong ability to resist risk and stress and have the potential for sustainable development.

Digital Economy Market's Response to the Epidemic. The digital economy market has demonstrated a strong ability to cope with the impact of the new crown epidemic, alleviating the pressure and uncertainty caused by the epidemic through a variety of means. First, digital transformation provides an effective means for the market to cope with the epidemic. Many enterprises have greatly mitigated the adverse effects of the paralysis of offline economic activities under the epidemic by establishing digital channels and promoting online services and product sales. In addition, digital means have provided the market with more efficient and precise services, making market operations more stable and economic activities less subject to major fluctuations due to changes in the epidemic.

Secondly, the digital economy market has taken a variety of measures to adjust its business direction, making the market more flexible and adaptable. In response to the needs of epidemic prevention and control, the market has taken the initiative to make supply-side adjustments and launched new services and products, such as online video conferencing and online medical care, which have made important contributions to the fight against the epidemic. In addition, the market has actively expanded market opening to further expand market demand and increase market sustainability.

Finally, the digital economy market ensured the stable operation of the market by formulating coping strategies and implementing policies. In the face of the impact of the epidemic, the market has formulated timely, flexible and effective countermeasures, such as strengthening online sales, controlling product supply, and implementing flexible contractual services, which have effectively mitigated the impact of the epidemic on the market. In addition, the government has adopted targeted policies to actively help enterprises cope with the epidemic, such as providing loans, tax exemptions and fees, etc., to maintain the stable development of the market.

To sum up, the Digital Economic Market has shown its powerful adaptability and capability to cope with the newly emerging Crown Disease. Various methods have been adopted to alleviate the adverse effects of SARS and have contributed greatly to the sustained growth of Guangzhou's digital economic sector.

Digital Economy Policy Responses to the Epidemic. After the outbreak of the Xingguang epidemic, Guangzhou has introduced a series of digital economy policies to actively respond to Pandemic Effects on Digital Economy Development. Among them, support policies for digital economy enterprises were one of the key focuses. The government introduced a series of policies such as reducing or waiving corporate

taxes and fees and subsidizing rents to help digital economy enterprises alleviate the production and operation difficulties caused by the epidemic.

In addition, the government is actively promoting the development of the online economy and encouraging enterprises to carry out their business and operational activities through digitalization. For example, it supports enterprises to utilize e-commerce platforms to promote sales; and promotes online conferences and online training to facilitate the rapid development of the digital economy during the epidemic.

In terms of the digital economy market, the government has actively guided the orderly development of the digital economy industry and stepped up its efforts to regulate the digital economy market during the epidemic. At the same time, the government promotes online consumption, reduces digital payment fees and other measures to promote online shopping while also bringing more traffic and activity to the digital economy market.

The continuous strengthening of digital economy policies has brought new development opportunities to the digital economy market and further improved the risk-resistant capacity of the digital economy. Especially during the epidemic, digital economy policies played an important role in solving the production and operation difficulties faced by enterprises and the shopping needs faced by consumers. It has also laid a more solid foundation for the subsequent development of the digital economy market.

Impact of Digital Transformation on the Improvement of Digital Economy Enterprises' Resistance to Epidemics. Digital transformation has become the way of survival and development for digital economy enterprises in the digital era, from which it can be imagined that, in the special period of the epidemic, digital economy enterprises may combine their own digital transformation process to take some measures to improve their anti-epidemic ability to cope with the impact of the epidemic on the enterprise.

In this context, it is particularly important to study the impact of digital transformation on the enhancement of digital economy enterprises' resistance to the epidemic. Based on the actual situation of digital economy development in Guangzhou City, this study explores the impact of digital transformation of digital economy enterprises on business management and product innovation during the epidemic through questionnaire surveys, case studies and other methods.

The results of the study show that digital transformation can improve the epidemic resistance of digital economy enterprises to a certain extent. First, during the epidemic, digital transformation makes the enterprise's operation and management more refined and personalized and can adapt to market changes more quickly. Secondly, digital transformation can promote product innovation and enhance the core competitiveness of enterprises. In addition, digital transformation can accelerate the informationization of enterprises and improve their ability to respond to information sharing, collaboration and management during an epidemic.

In the process of implementing digital transformation, digital economy enterprises should focus on the following points. First, when carrying out digital transformation,

they should carry out careful planning and implementation according to the characteristics of the enterprise's internal resources and external environment to ensure the quality and effectiveness of digital transformation. Second, they should focus on talent cultivation and formation to improve the success rate and effect of digital transformation in terms of full participation and cross-departmental cooperation. Finally, new methods and approaches of digital transformation should be constantly explored to realize the organic integration between digital transformation and the development of digital economy enterprises themselves.

In summary, digital transformation plays an important role in improving the resistance of digital economy enterprises to epidemics and is one of the effective means for digital economy enterprises to cope with challenges during epidemics. In addition, digital transformation is characterized by long-term, systemic and strategic features, and digital economy enterprises should focus on innovation and sustainable development while steadily promoting digital transformation to adapt to the new situation and new challenges in the digital era.

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In the coming years, the digital economy will remain uniquely relevant, particularly in the service sector. Data Driven and Smart Services will be one of the most significant trends in Digital Economy. For instance, it is possible to forecast the needs of the market by means of large data analysis to offer more precise services, while the Cloud and Artificial Intelligence are also able to manage manufacturing and distributing intelligently, thereby contributing to a high quality of the digital economy.

To sum up, it indicates that the digital economy plays an increasingly important role in modern society. For Guangzhou City, it will be helpful to enhance its interna-

tional competitiveness, enhance the collaboration with the relevant companies at home and abroad, and speed up the digital progress of Guangzhou City.

3.2 Future Development Trends of Digital Economy

Affected by the epidemic situation, the developing tendency of digitized economy has been paid great attention to. As the Internet of Things, AI, Block Chain continues to develop, the Digital Economy will have more opportunities to develop.

Digital services have become one of the main development directions of the digital economy. During the epidemic, digital services such as online office, online education, and online health consulting flourished, and their convenience and speed were loved by people. In the future, digital services will continue to expand, and the digital economy will gradually extend to the field of digital services. Digital transformation will also become a major trend of the digital economy in the future. During the epidemic, digital transformation around the world has made great progress, including online intelligent factories, intelligent logistics warehouses, intelligent medical care and other digital transformation projects, which will significantly improve production efficiency and promote economic development. In the future, digital transformation will gradually become popular, and the digital economy will develop rapidly along with it. The digital economy will continue to accelerate industrial upgrading. With the rapid development of smart manufacturing, smart logistics, smart cities and other industries, the digital economy will also continue to accelerate industrial upgrading. Under the impact of the epidemic, the development of digital economy in Guangzhou will pay more attention to industrial upgrading, promote technological innovation, and lead the development of China's digital economy. The digital economy has played an important role in the epidemic and will become an important engine of economic development in the future. Only by continuously promoting digital transformation and increasing investment in and support for the digital economy can we better meet future challenges and realize the prosperity and development of the digital economy.

4 Conclusion

Along with the worldwide Covid-19 pandemic, it has caused varying degrees of influence on all areas. As a kind of emerging economy, the digitized economy is not immune to it. What influence does the Covid-19 Epidemic have on the Digital Economy in Guangzhou, which is one of the most important cities in China? That's what we're talking about in this chapter.

Under the Covid-19 pandemic, Guangzhou's digital economy has gained new growth opportunities. To further its progress, people must harness digital technology's advantages. This involves strengthening digital technology innovation for industrial upgrading, enhancing policy guidance, and increasing cooperation and resource sharing. These efforts will drive the high-quality development of the digital economy, expanding its market space and vitality.

The Crown Epidemic brought great difficulties to all kinds of businesses, and digital economy businesses were no exception. During the epidemic, population movements decreased, business activities shrank, and the operations of many digital economy businesses were greatly impacted. Some small businesses, in particular, found it even more difficult to sustain themselves in poor economic conditions. Some businesses had to temporarily close down and suspend operations, or resort to downsizing and layoffs to cope with the challenges posed by the epidemic. The digital economy has also played a large role in the Covid-19 pandemic. Applications in the digital economy such as online office, online education, telemedicine and online shopping have been widely promoted. Online office and online education, in particular, became the main modes of work and study during the Covid-19 pandemic. Digital economy companies also innovated rapidly in these areas, with tools such as online meetings, remote collaboration, and online live streaming being widely used, and the development of these emerging areas became an important force in promoting the continued growth of digital economy companies. There is a need to think about the impact of the Covid-19 pandemic on the future development of the digital economy in Guangzhou and policy recommendations. Digital economy enterprises should propose more concrete solutions to deal with the Covid-19 pandemic through innovative models and exploring new directions for development. The government should also increase its support for digital economy enterprises and provide more policy support and assistance so that digital economy enterprises can recover and develop more quickly in the epidemic and promote the digital economy of Guangzhou to a new height.

Digitized economy is expected to be one of the most significant economic developments in Guangzhou. Reinforcing the use and innovation of digitized technique, giving full play to governmental guidance, and improving collaboration and sharing are the key to developing digitized economy in the future. So, it is necessary for us to push forward the digital economic growth, achieve a profound combination between the digital and the traditional economic, and offer a new impetus for the high quality economic growth in Guangzhou.

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