

The Rise of China's Digital Economy during the COVID-19 Crisis

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1. Introduction

Since the outbreak of the COVID-19 pandemic, the Chinese government has been focusing its efforts on fostering the digital economy by emphasizing digital technologies such as artificial intelligence, cloud computing, big data and 5G. President Xi Jinping stressed the need to expand artificial intelligence and 5G technologies in response to COVID-19, noting “the proliferation of COVID-19 is a challenge and opportunity for industrial development.”

According to the China Institute of Information and Communication, China's digital economy accounted for about 34.8 percent of its gross domestic product, at 31.3 trillion CNY as of 2018. In addition, from 2016 to 2018, China's digital economy continued to grow at a rate of more than 20 percent per annum for three years. In addition, the Chinese digital ecosystem is expected to further expand as various non-face-to-face business models such as digital healthcare, digital education, and telecommuting grow due to the COVID-19 pandemic. This

paper aims to identify the development trends in China's digital economy since the outbreak of the pandemic and analyze the Chinese government's support policies and new business models in the digital service sector and present the implications carried by the results of the analysis. This study will also propose new cooperation measures between Korea and China.

2. The Chinese Government's Post-pandemic Digital Support Policy

(1) Preventative Policies Using Digital Technology

Following the spread of the novel coronavirus, the Chinese government quickly announced a support policy to utilize digital technologies such as artificial intelligence, 5G, and cloud computing. On February 18, 2020, the Ministry of Industrial Information and Communication issued an announcement, which read “A notification of the prevention of infectious diseases and the resumption of operations by applying

next-generation technology.” By utilizing digital technologies such as artificial intelligence and 5G, the Ministry publicized its push for scientific and efficient prevention through virus diagnostic tests, infection path tracking, and vaccine development. It also emphasized that it will expand the application of industrial Internet, augmented (AR) and virtual reality (AR) technologies and apply new models such as autonomous production and remote plant operations to restore production such as well.

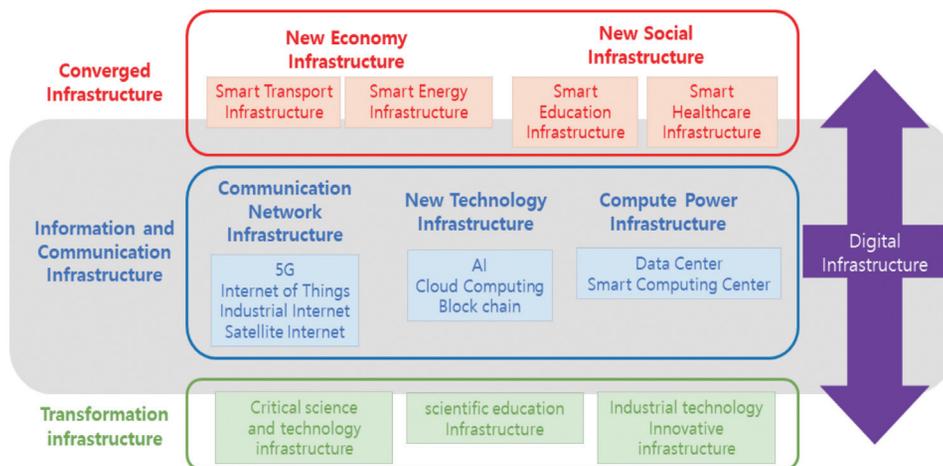
The National Committee for Hygiene and Health has been supporting the expansion of remote medical care platforms related to smart healthcare since the COVID-19 outbreak. On February 3, the National Health Commission issued a notice on COVID-19 preventing and controlling infection by strengthening information and communication technology. The Commission emphasized the use of digital technology to expand 24-hour offline medical consultation and online prescription and drug delivery by medical institutions and Internet companies. On March 2, the government announced its opinion on the promotion of Internet+ medical insurance services during the COVID-19 quarantine period, and took emergency measures to include online medical expenses and medications in the medical insurance coverage. In addition, the Ministry of Commerce, Industry and Energy issued a notice on March 26 (fi5Gfi) promoting the accelerated adoption of 5G and emphasizing the construction of 5G networks and the application

and distribution of related technologies. The government emphasized that 5G technologies should be applied to education, networked automobiles, medical care, and the industrial Internet to pursue synergies. In particular, telecommunications companies were asked to keep 5G base station construction targets intact and mitigate the impact of COVID-19. As a result, China’s top three mobile carriers — China Mobile, China Unicom and China Telecom — announced that they would invest up to 180.3 billion CNY in 5G this year and build nearly 550,000 more base stations this year.

(2) Government Policy on Building Digital Infrastructure

The Chinese government first proposed the concept of “new infrastructure” at an economic meeting in December 2018. The term is used to differentiate traditional infrastructure such as railways, ports, and roads from new digital infrastructure. The government emphasized at that meeting that China should build a new infrastructure centered on digital technologies such as 5G, artificial intelligence and IoT to accelerate the advancement of the country’s industrial structure and augment future growth engines. Since then, the Chinese government has reemphasized investment in new infrastructure as economic growth has slowed and COVID-19 has made clear the importance of investment. On March 4, China’s Central Political Council emphasized economic stimulus

Figure 1. New Infrastructure Scale Based on Digital Infrastructure



Source: Cho Eunkyoo (2020), "China's New Infrastructure Investment and Implications after COVID-19".

by building new infrastructure such as 5G base stations and Internet data centers. The council identified seven major types of infrastructure, including 5G, data centers, AI, high-speed railways, special high-pressure electric vehicle charging stations and the industrial Internet.

Later, as demand for digital technology in the non-face-to-face sector soared due to the pandemic, the National Development and Reform Committee expanded the scope of new infrastructure on April 20. The revised list consists of information infrastructure centered on digital technologies such as artificial intelligence, 5G, blockchain, IoT, satellite Internet and convergence infrastructure that combines technologies such as artificial intelligence, IoT, and big data in the transportation, energy, education and medical fields and innovation infrastructure. The ministries and local governments in charge of each project announced plans to build high-tech infrastructure such as 5G base stations,

data centers, an industrial Internet of Things, blockchain platforms and IoT network innovation centers.

It is particularly noteworthy that private Internet companies participate in digital infrastructure investment projects in fields such as artificial intelligence, cloud computing and IoT. After the government announced its new infrastructure policy, private Internet companies such as Alibaba, Tencent and Jingdong announced investment plans in the new infrastructure sectors. Moreover the government encourages the active participation of private capital in new infrastructure investments by promoting Public Private Partnerships (PPP).

(3) Government Policy to Revitalize the Consumer Market by Utilizing Digital Technology

Through local governments China is issuing

Table 1. Status of Distribution of Consumption Coupons by Region

Area	Scale	Receiving method	Use range
Hangzhou	1.68 billion CNY	Alipay (支付宝) etc.	Food and beverages, shopping malls, hospitals, gas stations, etc.
Ningbo	250 million CNY	Alipay (支付宝·Alipay) etc.	Culture/art, tourism, etc.
Nanjing	13 million CNY	Wodenanjing (我的南京) app	Food and beverages, shopping malls, sightseeing, etc.
Jinan	20 million CNY	Tianpiaopiao (贴票票) app	Art galleries, travel agencies, online viewing, etc.

Source: Authorial compilation from media sources.

digital consumption coupons to boost the consumer market that has contracted due to the pandemic. From the end of March to April 2020, the cities of Hangzhou, Ningbo, Nanjing, and Jian issued consumption vouchers to local residents. Digital consumption coupons were issued through local government administrative service applications or the mobile payment platforms of private fintech firms.

In the case of Hangzhou, mobile payments such as Alipay were common before COVID-19 struck, and so the effect of issuing consumption coupons has been significant. The vouchers issued by Hangzhou City are a kind of discount coupon that subtracts 10 CNY from every 40 CNY spent. The coupons are accepted at six million places of business in Hangzhou, including restaurants, shopping malls, hospitals and gas stations. According to a study by Beijing University's Gwanghwamun Institute (2020) using Hangzhou as an example, government subsidization of the first yuan spent leads to new consumption of more than 3.5 CNY on average.

Unlike direct cash disbursements, digital

consumption coupons rapidly exert observable consumption promotion effects as e-commerce companies and mobile payment platforms issue consumer coupons together. Furthermore, digital consumption coupons can track the time, place, and method of consumption using big data and AI algorithms, increasing the utilization, accuracy, and effectiveness of digital coupons compared to paper coupons.

3. China's Emerging Digital Services Market Post-COVID-19

(1) Digital Healthcare

After the pandemic was brought under control in China, major Internet companies began to release services such as remote reading and telemedicine in unison as the Chinese government urged Internet companies to kickstart the online medical care industry. During the Spring Festival, immediately after widespread transmission of COVID-19 had begun, up to 6.71 million users received telemedicine through major Chi-

nese online medical applications every day, up more than 30 percent from a year earlier. Last year, China's telemedicine market was valued at nearly 19 billion CNY, more than quadrupling from 2015.

The Chinese government has allowed telemedicine since 2014, and since 2015, the number of Internet hospitals have increased sharply, encouraging the establishment of an online medical service platform between IT companies and hospitals. Moreover, China's Ministry of Health has allowed medical insurance to be used for prescriptions from Internet hospitals since the pandemic began.

Furthermore, with COVID-19, China's digital healthcare market has become a competitive arena venue for digital technologies such as AI, robots, and big data. Chinese Internet companies such as Baidu, Alibaba, and Tencent have been incorporating digital technologies into their healthcare-related businesses since 2015, actively expanding the market by developing AI diagnostic systems and offering free telemedicine services over the period of the COVID-19 outbreak.

In addition, AI "unicorn" firms such as Ping Ankerzie and Senstime are also actively using AI technologies such as facial and voice recognition in quarantine sites to compete in the digital healthcare market.

(2) Telecommuting

As telework becomes increasingly common due

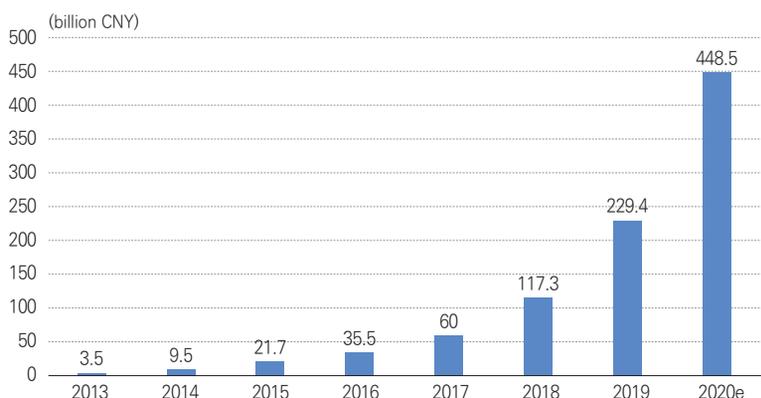
to the spread of COVID-19, demand for telework platforms and teleconferences for non-face-to-face work is exploding across industries.

According to iResearch (2020), about 18 million telecommuting platforms emerged in China during the Spring Festival, with about 300 million users. In addition, Alibaba's video conferencing platform, Ding Talk, was released on February 3, attracting more than 200 million users, topping the most-downloaded list in the Chinese Application Store on February 5. The size of China's telecommuting market increased about 1.9 times year-on-year to about 44.9 billion CNY in 2020, due to a surge in demand following the COVID-19 outbreak.

Since late January, shortly after the COVID-19 outbreak, leading Chinese Internet companies such as Alibaba, Huawei, and Tencent have provided free video conferencing platform services.

Alibaba's DingTok provides video conferencing, online commuting records and document approval services to large Chinese companies, schools, and government agencies. Over 20 million video conferences were held by the end of February 2020, and the daily average number of users exceeded 100 million. Tencent also began offering its Tencent Meeting platform for free for up to 300 people simultaneously on January 24; its userbase increased by 50 to 80 percent from the pre-COVID-19 era. In addition, Tencent is taking its meeting platform global, having released an international version of the service on March 23 and adding more than one million CPU cores.

Figure 2. Changes in the Size of China's Telecommuting Market



Source: China Merchants Industry Research Institute (2020), *Forecast of the Market Size and Future Trends of the Remote Office Industry 2020*.

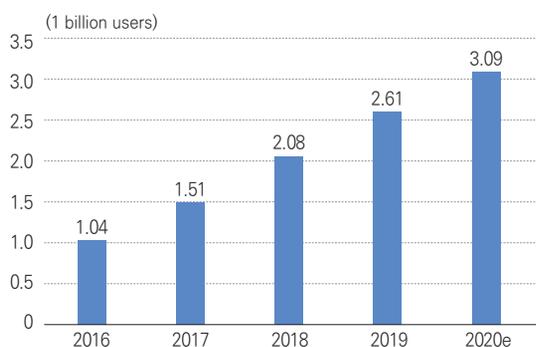
(3) Online Education

Online education services are replacing in-person curricula as schools and academies across the country are closed due to COVID-19. On February 6, the Chinese Ministry of Education announced that it will expand the establishment of an online education platform using information and communication technology in a notice. On February 17, the nation's elementary and middle school national cloud learning plat-

form was released, and it began broadcasting lecture programs for elementary school students through the state-run China Central Broadcasting System (CCTV).

According to the China Internet Network Information Center (2020), as of March 2020, online education users numbered 423 million, up 110.2 percent from the previous year, accounting for 46.8 percent of all Internet users. With about 260 million students taking online classes, demand is exploding and various online educa-

Figure 3. 2016–2020 Number of Users in China's Online Education Market



Source: iResearch (2020), *2019–2020 Research Report on the Development of China's Online Education Industry*.

Figure 4. 2016–2020 China's Online Education Market Size



tion application platforms are being released.

According to iResearch (2020), the number of online education users in China was expected to have reached about 300 million in 2020, with a market size of 453.8 billion CNY. In addition, Chinese online education is improving the quality of services, as digital technologies such as AI and 5G are being applied. For example, China's leading facial recognition company, Sangtankerge, is increasing efficiency in customized education for each student by recognizing and providing students with facial expressions. In addition, VR laboratory construction through 5G communication technology is expanding. Baidu, China's largest search portal company, recently distributed smart classroom platforms using VR to about 4,000 schools nationwide, providing a method online teachers and students to conduct vivid online classes with VR.

Post-pandemic, China's online education market is expected to grow rapidly, along with investments and expansion in digital technologies such as artificial intelligence and 5G in China.

4. Implications

China has used the COVID-19 crisis as a strategic opportunity for the development of the digital economy with the government's active support policies and aggressive investment by Internet companies. It is predicted that China's digital economy will accelerate development by sparking investment in high-tech development

and related fields to boost an economy that has slowed down amid the pandemic. In addition, China is expected to expedite its aggressive investment and independent development of digital technology to gain the upper hand in the global digital ecosystem in response to the intensifying U.S.-China technology hegemony competition.

As we have seen before, Chinese Internet companies such as Alibaba, Tencent, and Baidu are expanding their digital ecosystems in China based on AI, big data, and IoT technologies, and this trend is expected to intensify after COVID-19 is suppressed. China is expected to compete with American Internet companies such as Alphabet, Amazon, and Facebook as it forms its own platform value chain (PVC), and the digital transformation of both countries is likely to be carried out independently.

Changes in external conditions, such as decoupling of the U.S.-China digital economy, expanding technology protectionism, and the growth of China's digital domestic market, provide challenges and opportunities at the same time. It is time to look for strategies to strengthen the competitiveness of new industries and ways to expand into the Chinese digital market to preempt positioning in the digital-based value chain.

First, South Korea urgently needs to come up with a strategy to foster the digital economy in order not to miss a golden opportunity, as China mounts an offensive to establish itself as the strongest digital economy. Although China is

pushing for investment in digital infrastructure, it seems that if we focus on investing in the digital sector, Korea can outpace China in building infrastructure across society and secure competitiveness in related industries. Korea also announced in May directions for the Korean version of the New Deal policy. Strategic measures were promulgated to foster the digital economy, including the establishment of digital infrastructure, fostering non-face-to-face industries and digitizing of social overhead capital (SOC). It is time for detailed measures to accelerate digital economic innovation.

Therefore, investments should be focused on communication networks, which are the most important infrastructure in digital transformation, and R&D should be accelerated to secure 6G technology standards beyond 5G. China has emphasized the use of 5G technology since the COVID-19 outbreak, and is making investments to hasten the construction of 550,000 5G base stations nationwide. In addition, telecommunication businesses such as China Mobile and Huawei started researching and developing 6G in 2018. In November 2020, the 6G R&D Promotion Working Group was launched under the leadership of China's Ministry of Science and Technology, with a goal to begin commercialization by 2030. Korea also began conducting basic research on 6G since January 2020. Amid a renewed emphasis on the importance of the digital economy vis a vis COVID-19, ultra-connected network infrastructure is an important opportunity to secure future communication

and global digital ecosystem leadership. We need to speed up the launch of technological research and development projects in the 6G sector so that we do not miss this golden opportunity.

In addition, it is necessary to establish a market-led digital ecosystem by actively expanding investment by private IT companies. Shortly after the announcement of the new infrastructure investment policy, Internet companies such as Baidu, Alibaba, and Tencent announced investment plans in data centers (IDC), IoT industrial bases and blockchain, and are aggressively building digital infrastructure. During the COVID-19 era, Chinese Internet companies drove demand growth in digital services and launched various lines of business. Baidu opened its AI source code to businesses, institutions and developers for free, and offered more than 100 online artificial intelligence courses. Korea also needs to create an environment so that digital ecosystems can be established mainly by the private sector in the long run. To this end, private-led digital ecosystems should be established by expanding private participation in digital infrastructure construction projects and fostering investment platforms that can match consumers and suppliers.

Finally, it is necessary to come up with a plan to advance into areas where demand is expanding in China post-pandemic. On May 22, Chinese Foreign Minister Wang Yi emphasized cooperation between South Korea, China, and Japan in the fields of healthcare, smart manu-

facturing, and 5G at a press conference at the National University of Korea. In particular, the healthcare sector is an area where demand continues to expand in China and where we have competitiveness. Above all, Korea has excellent medical personnel and its medical devices sector is more competitive than China at the global level, making it one area where external demand is expected to grow going forward. In particular, China's digital healthcare market, where telemedicine is allowed, is expected to be an opportunity for Korea, which has both IT and medical technology. COVID-19 has thus spurred the creation of new demand in the Chinese digital services market, and it is necessary to find opportunities for us to enter this market by discovering and implementing business models with a competitive advantage.

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