PAST, PRESENT AND FUTURE.

HOW IS CHINA'S DIGITAL INFRASTRUCTURE AND HOW CAN IT INSPIRE BRAZIL?

Mike Liu e Peng Cheng

OVERVIEW

In the past 30 years China has experienced a dramatic growth in its digital economy. Ever since the recovery from the internet bubble burst in the early 2000s, China has been heavily invested in digital infrastructure to accommodate the growth of strong demands in mobile devices. In 2000, the GDP of China's digital economy was insignificant. Fast forward 20 years, the number explodes to a whopping 39.2 trillion RMB[1] in 2020. As the scale of digital economy skyrockets, so does its criticality. According to the White Paper on China's Digital Economy Development, the digital economy contributes to 38.6%[2] of China's total GDP. Moreover, it grows at a rate of 9.7%[3], three times of the GDP growth in the corresponding period, rendering it a thrusting force in economic growth.

The number of internet users shared a similar growth pattern. In 2000, only 16 million[4] people had the access to the internet in China, covering only 1.3%[5] of the entire population. In 2020, the number surged to almost 1 billion[6], covering 70.4%[7] of the population, which is 5.9% higher than the previous year. These figures are especially significant during a pandemic. While the global economy shrank by a negative 4.4%[8], China's economy contributed a positive 2.3% growth year over year, and China has been the only major economy to yield positive growth.

In fact, according to a research by Tufts University's Fletcher School, China exhibited the greatest digital evolution momentum and resilience out of all countries in the world. The pandemic catalyzed the development of digital infrastructure worldwide, as demand for online conferencing and work from home facilities became a crucial part of our lives. Whereas China was categorized in the "Break Out" group, which are economies with low levels of existing digitalization but high momentum in digitalization, in the study, Brazil was placed in the "Watch Out" group, which are economies with both low levels of existing digitalization and momentum in developing digital infrastructure.[9]

As Brazil and China share similarities in terms of large geographical size, population, and growing digital users, China's journey in digital transformation can be a relevant case study for Brazil. This paper will discuss how China succeeded in building digital infrastructure in a relatively short period of time and it will include two case studies which China has tackled those strategic initiatives through leveraging digital technologies. The paper will also reflect on some areas for future improvements, and how these experiences can be relevant for the development of digital infrastructure in Brazil.

INFRASTRUCTURE ENABLES THE POSITIVE GROWTH

Since the COVID-19 outbreak, China's new infrastructure plan has become an important vehicle to meet the goal of dual circular economy strategy. The dual circular economy will not only stimulate local job creation in China, especially in the rural area to expedite the process of extreme poverty reduction, but increase the trades with the countries in Europe, South East Asia and Middle Asia regions through land transportation.

At the 2020 National People's Congress, China announced that in addition to doubling down on its Made in China 2025 and China Standards 2035 initiatives, it would spend approximately US$1.4 trillion on a digital infrastructure public spending program.[10]

Massive infrastructure expenditure enables China to be the global leader in e-commerce, totalling around US$1.8 trillion in sales in 2020, with 989 million digital consumers.[11] E-commerce giants Alibaba and JD.com have racked up around $115 billion in sales across their platforms during the Singles Day (similar to the Black Friday in the States) alone, a shopping event in China that heavy discounts are applied across millions of products on major e-commerce platforms.[12] Meanwhile, China is getting credit for its poverty alleviation efforts, by successfully eliminating extreme poverty – nearly 100 million people in rural areas who had lived below the poverty line all shook off poverty – by the end of 2020.[13]

E-Commerce made China the only growing major economy during the pandemic. But how China leverages its infrastructure to realize e-commerce growth, and how these two sectors have complemented each other to further enable China to achieve impressive poverty alleviation?

INVESTMENT ON BASIC INFRASTRUCTURE

China has invested substantial amounts of funds in infrastructure connectivity. Between 1992 and 2013, China spent 8.6 percent of its GDP on building roads, railways, airports, and seaports that have been crucial for the reliable movement of goods.[14] That same spending figure was just 2.5 percent for Western Europe, and 2.5% for the combined GDP of the US and Canada. [15]

According to estimates made by analysts at the CCID Think Tank Electronic Information Institute, the investment associated with new infrastructure projects is expected to total around RMB 10 trillion (US$ 1.43 trillion) to RMB 17.5 trillion (US$2.51 trillion) for the next five-year period until 2025.[16] Among them is the Shanghai plan, which set the total investment target for the next three years at RMB 270 billion (US$38.7 billion), while Guangzhou signed 16 digital new infrastructure projects with a total investment of RMB 56.6 billion (US$8.09 billion). Zhejiang province, home to tech giant Alibaba, also committed to a new batch of projects – 61% of which are in the high-tech field, a 20% increase from the previous year.[17]

INTERNET ACCESS

As of December 2020, the internet penetration rate in China is 70.4%, 5.9% higher than that in March 2020. Among them, the number of rural internet users is 309 million, an increase of 54.71 million compared with March's figure; the internet penetration rate in rural areas is 55.9%, an increase of 9.7% compared with spring. In recent years, substantial progress has been made in the in-depth development of online poverty alleviation, and the transformation of non-internet users in remote and poor areas has been accelerated.[18]

Bringing the population online has also been key to growing e-commerce in China, as connectivity was the first step in bridging the rural-urban divide and increasing the number of people online allowed platforms to continually reach for new markets in China. In 2015, the Chinese government invested an estimated US$21 billion to expand broadband internet to 98% of the country's 500,000 administrative villages by 2020,[19] as of Dec 2020, internet users in the rural area are over 300 million.

MOBILE PAYMENT

As of December 2020, the number of online payment users in China has reached 854 million, accounting for 86.4% of the total Internet users.[20] By aggregating supply chain services, online payment helps merchants to push information accurately, and it helps China's small and medium-sized enterprises to reach out to more clients to complete the transactions easily and securely through digital payment platforms. Many of those clients are located in tier 3 to tier 5 small counties, and thanks to digital transformation and promotion of living a life digitally, the new lifestyle narrows the gaps between the East and the West region, and between urban and rural areas through accessing to the integrated online shopping and payment platforms.

In 2020 alone, China has invested $138.5 billion in 5G networks and it is projected that 5G users will reach 48% penetration by 2025.[21]

Up to 2020, 99% of all remote villages has been covered with electricity, and 98% has the access to either fiber or 4G networks. With such a strong push in digital infrastructure, one of the strategic benefits is to accelerate the poverty alleviation in the remote areas. In 2020, China central bank has started the pilot of digital currency through sharing the red packets in Shenzhen, Suzhou and other trial cities, and achieved phased results. In the future, digital currency will further optimize its functionalities, cover more consumption scenarios, and provide more digital life convenience for internet users.[22]

INNOVATION BY PRIVATE SECTORS

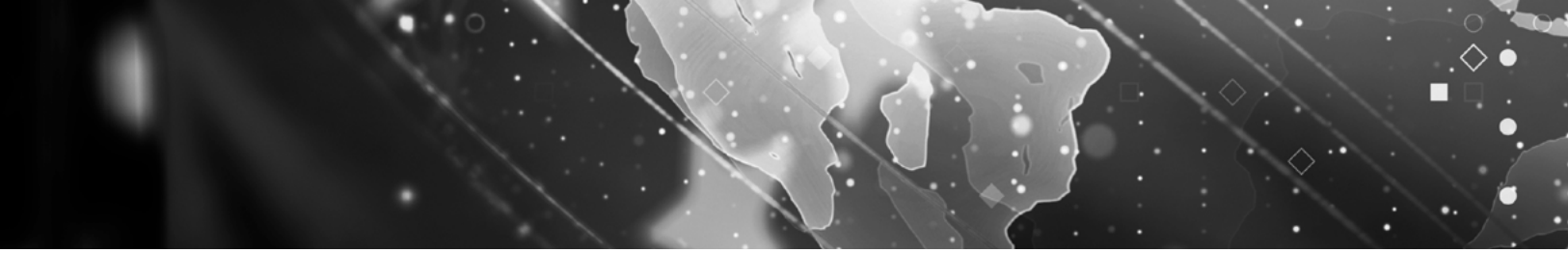
The Chinese government did not just create the conditions for retail markets and e-commerce to grow organically. It was not laissez-faire. Instead, both policies and subsidies driven by the government, coupled with innovation and the drive for new markets by foresighted private enterprises, played a key role in growing e-commerce and mobile money in China over the past 15 years. [23]

Poverty reduction was not a key driver for e-commerce growth at first. However, research conducted by the World Bank and the AliResearch Foundation concluded that e-commerce as a key "digital technology" had contributed to inclusive growth in rural China by lowering the required skill threshold for sellers, and allowing individuals, including the less educated, to participate in e-commerce and therefore develop more skills and earn more money.[24] Furthermore, digital giants have done enormously jobs to penetrate rural market.

Alibaba

Supported by well-developed infrastructure, Alibaba's Cainiao Network offers an innovative, data-driven platform that helps improve efficiency and customer experience for all supply chain partners. At a high level, it can be summarized as a logistics platform that focuses on freight between warehouses that then use third-party partners to complete last-mile deliveries.

In December 2017, Alibaba invested around US$1.6 billion to establish 30,000 service centres, as part of its Taobao Village program across China to enable faster deliveries and allow villagers with little or no access to the internet to use the Taobao shopping platform. Alibaba already had strong partnerships with logistics companies in bigger cities and towns and used the same strategy of integrating and aligning logistics to improve delivery time in rural areas.



The company's initiatives also include improving downstream market access for farmers and training younger talent, revamping midstream logistics infrastructure to reduce waste, lower costs and speed up the delivery of agricultural products.[25]

Pinduoduo

Pingduoduo, a premium online shopping platform, which encourage friends, and families to shop directly with last tier service providers for goods in volume with the best possible price. Pinduoduo focuses on agricultural goods since its establishment in 2015, bringing a systematic approach to addressing the inter-related issues of how to grow, move and sell agriculture food. Pingduoduo has leveraged the digital infrastructure to reach out to millions of farmers in rural areas and the transaction value of agricultural goods in 2020 has reached $41.6 billions. Pan Zhiyu, a farmer in Yulin of Guangxi province, started with $3K in 2016 to open a fresh fruit shop on Pingduoduo. Since then, he has enjoyed phenomenal business online with daily orders of 4,000, and accumulated sales of $11.8M in the past 4 years.[26]

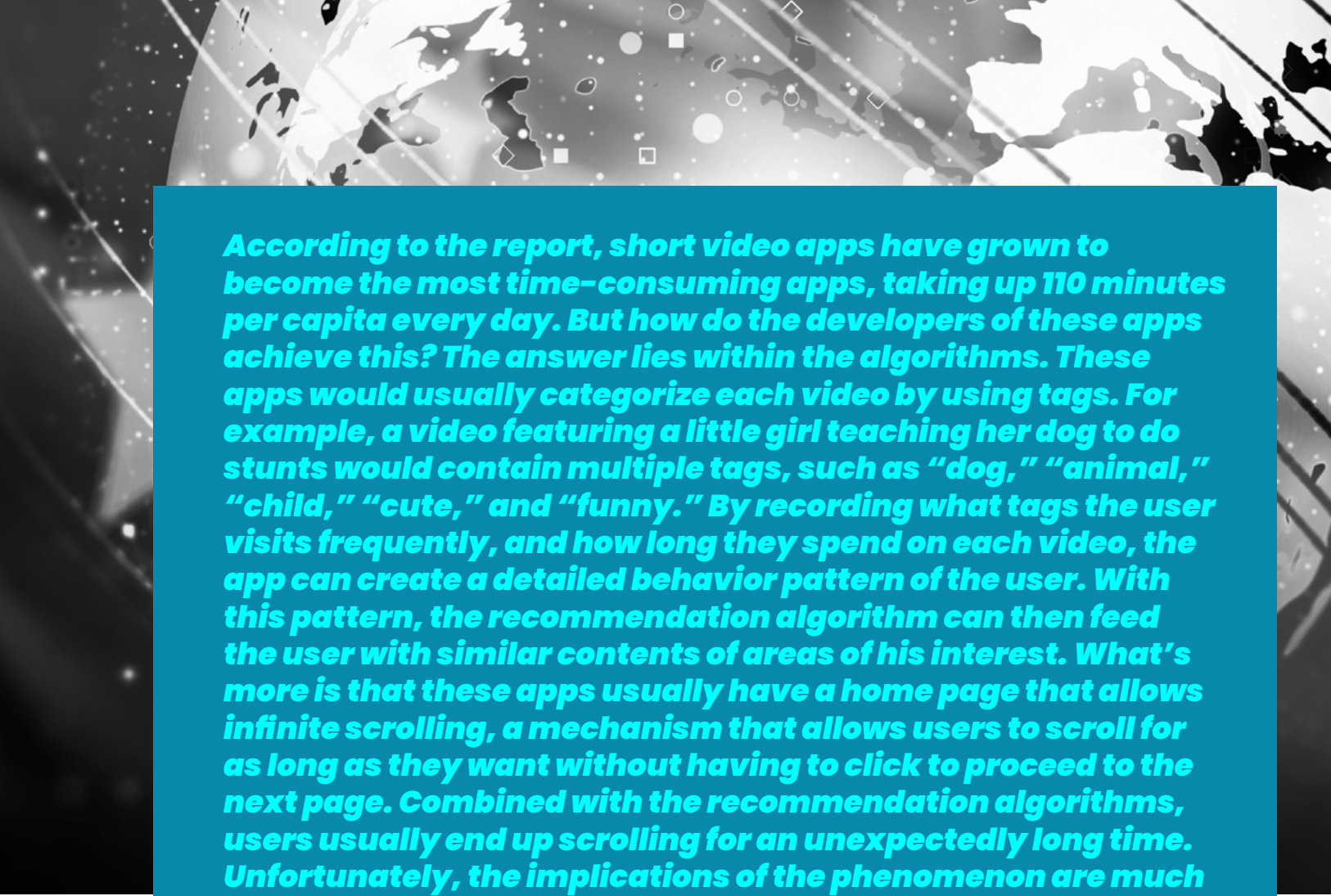
Duo Duo Orchard is one of the innovation the company made in its poverty alleviation efforts. In this in-app game, users can grow virtual fruit trees with water droplets collected by completing fun tasks. Users receive free fruit after their virtual is fully grown, courtesy of Pinduoduo, which sources the fruit from poverty-stricken areas to boost farmer incomes. Duo Duo Orchard has more than 60 million daily active users and Pinduoduo sends out more than 1 million kilograms of free fruit each day.[27]

The company also works with industry partners and universities to develop upstream technology to increase the resilience of the food supply chain.

OBSTACLES AND OUTLOOK

Modern Technology and Morality

Despite China's quick success in digitalization, there remains a few serious issues to address. Like other digitally developed nations, China's regulations on technology service providers are far from perfect. An important yet tricky matter to address is the addictiveness of technological products. Most popular softwares these days are designed to drain as much focus from the users as possible. In the documentary "The Social Dilemma", former Silicon Valley product designers discuss how companies tweak designs and mechanisms base on human psychology to encourage users to stay on their applications for a little longer. In China, this phenomenon is especially severe among short video applications. Short video apps are the most popular among softwares of all categories. Two of the most competitive short video software companies are Kuaishou and ByteDance, owner of Douyin, also known as TikTok. With Kuaishou valued at $110 billion dollars and ByteDance valued at $180 billion dollars, the two short video colossuses are ranked 14th and 2nd out of all privately-owned companies in China. Out of all internet users, 87% watch short videos on a daily basis.



According to the report, short video apps have grown to become the most time-consuming apps, taking up 110 minutes per capita every day. But how do the developers of these apps achieve this? The answer lies within the algorithms. These apps would usually categorize each video by using tags. For example, a video featuring a little girl teaching her dog to do stunts would contain multiple tags, such as "dog," "animal," "child," "cute," and "funny." By recording what tags the user visits frequently, and how long they spend on each video, the app can create a detailed behavior pattern of the user. With this pattern, the recommendation algorithm can then feed the user with similar contents of areas of his interest. What's more is that these apps usually have a home page that allows infinite scrolling, a mechanism that allows users to scroll for as long as they want without having to click to proceed to the next page. Combined with the recommendation algorithms, users usually end up scrolling for an unexpectedly long time. Unfortunately, the implications of the phenomenon are much worse: radicalizing class division and social inequalities.

Better educated users who understand the mechanism would intentionally limit their exposure to short video apps, whereas users who are less educated tend to fall into the sugary trap and simply consider the apps as magical machines to feed the stuff endlessly. Of course, this is an oversimplification of users, but this remains a critical issue for policymakers to consider what regulatory effort is required to protect the interests of those vulnerable groups.

Privacy

However, software addiction is not the only issue. Privacy is perhaps a trickier problem. As the number of softwares continue to grow at a rapid pace, so does the amount of malware disguised as normal applications. In fact, in April 2021, China's Ministry of Industry and Information technology banned over 60 applications due to the illegal collection of data. These clickbait softwares seem no different to our everyday applications on the surface, but once the user initializes the program, data collection starts right away. From microphone and video to storage, these malwares can potentially collect any data on the user's device.

However, that is not to say legal data collection is completely safe. Various applications these days legally request an enormous amount of personal data from users, from birthday to social security numbers, our lives are deeply bound with technology companies. Unfortunately, and possibly, your personal data have already been compromised. Your data, along with those of others, are likely to be sold in packages in large quantities at a very low price. According to an undercover research from a Beijing Daily journalist, for just $30, anyone with access to the dark web market, can purchase personal information of a million students, 1500 sets of personal IDs, and bank transaction records of 100 users. To make matters worse, some companies collect data in the name of improving the product nominally but sell them to other companies instead. Have you ever wondered why sometimes after a conversation about dogs with your friends, shopping website suggests dog food for you? This is likely to be the result of an application you have opened selling audio data to the shopping website you use.

Needless to say, stricter regulations on what data can be collected and swifter responses to violation of regulations need to be put in place.

The Outlook

China is undergoing major transformation leveraging the technologies to improve the well-being of the society. China's primary focus at the moment is 5G coverage. As 5G economy expert Tingjie Lv states, 5G is the "game-changing technology." Indeed, the high bandwidth and low latency of 5G allows alternative and elegant solutions to existing problems. In the realm of internet of things and autonomous driving, the low latency of 5G enables cars to communicate and determine the optimum routes to take at each junction, to significantly reduce commuting times. In the realm of medical treatment and examination, the low bandwidth empowers ambulances to send real-time data of patients' conditions to hospitals. In addition, doctors in top hospitals can also help examine and diagnose cases from remote regions, or even carry out remote surgeries powered by 5G's low latency. With all these clear benefits, 5G networks will definitely further enhance the capability and capacity of the infrastructure to bring the vibrant digital lives to our society.

Mike Liu

Vice President, Senior Fellow at Center for China and Globalization, Distinguished Professor at China Business Executive Academy, in Dalian, Vice Chairman of Shanghai Pudong New Area Federation of Returned Overseas Chinese and Trustee of SA Shi Xuan Elite Foundation

Mike Liu is an accomplished executive with 30+ years of professional experience in digital transformation, operational excellence, cross culture leadership development and market growth strategies with leading technology multinationals.

He is the former Managing Director and legal Rep for DXC Technology in Greater China region, and before that Mike was the global Vice President, Country Head and legal Rep for Infosys in Greater China region.

Mike's experience spans across Greater China, US, Singapore, and India. He is a frequent speaker and moderator at various industry forums. Mike has been invited to participate in the Summer Davos in 2017, the Business Summit of BRICS in 2017, and Qingdao Multinationals Summit in 2019. Mike is the recipient of Top 10 Figures in China Outsourcing Industry and Top 100 Figures in China IT and Service Industry. He served as one of panelists at 2020 Talent 50 Forum in Hangzhou.

Mike completed the executive education at Stanford University, and holds an MBA from University of Miami in Florida and a bachelor's degree in CIS from Renmin University in Beijing.

Peng Cheng

Project Manager and Assistant Researcher at Center for China and Globalization (CCG). Chris joined CCG in 2019 and has been participating various research projects regarding international economics and business globalization.
Prior to CCG, Chris spent a year in Ethiopia assisting local infrastructure upgrading and conducting research on Belt & Road Initiative and its implication in East Africa. He also had brief spell in investment banking industry.
He holds an Honours Business Administration degree from the Richard Ivey School of Business at the University of Western Ontario.

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